SPIE Security+Defence

SPIE Remote Sensing

Connecting minds for global solutions

Technical Programme

Conferences: 20-23 September 2010
Exhibition: 21-22 September 2010

Centre de Congrès Pierre Baudis
Toulouse, France

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Connecting minds. Advancing light.





SPIE Remote Sensing

Steven P. Neeck
NASA Headquarters (USA)
2010 Symposium Chair

Karin Stein
Fraunhofer-IOSB Institute of Optronics, System Technologies and Image Exploitation
2010 Symposium Co-Chair

Cooperating Organisations

EARSC

SFPT

EOS European Optical Society Conference for Europe

Remote Sensing and Photogrammetry Society

DGPF

German Society for Photogrammetry, Remote Sensing and Geoinformation

cnes
Centre National d'Études Spatiales

SPIE Security+Defence

David H. Titterton
Defence Science and Technology Lab., United Kingdom
2010 Symposium Chair

Reinhard R. Ebert
Fraunhofer IOSB, Germany
2010 Symposium Chair

Bernard Rosier
ONERA, The French Aerospace Lab., France
2010 Symposium Chair

Cooperating Organisations

EMRSDTC
Electro Magnetic Remote Sensing Defence Technology Centre

OPTHER

SFO
Société Française d'Optique
French Research of the EOS

SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, Programme committees, and session chairs who have so generously given of their time and advice to make this symposium possible. The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members.

This Programme is based on commitments received up to the time of publication and is subject to change without notice.

Managed by SPIE Europe

SPIE Europe Ltd., a subsidiary of SPIE, is a not-for-profit UK-registered company serving SPIE constituents throughout Europe as an advocate and liaison to political and industry associations within the European optics and photonics community.

In addition to providing membership services, SPIE Europe Ltd. organises and manages internationally recognised conferences, education programmes, and technical exhibitions featuring emerging technologies in optics and photonics.

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Remote Sensing 2010

Conferences

Security+Defence 2010

Conferences

Maps

Level -1

Exhibition

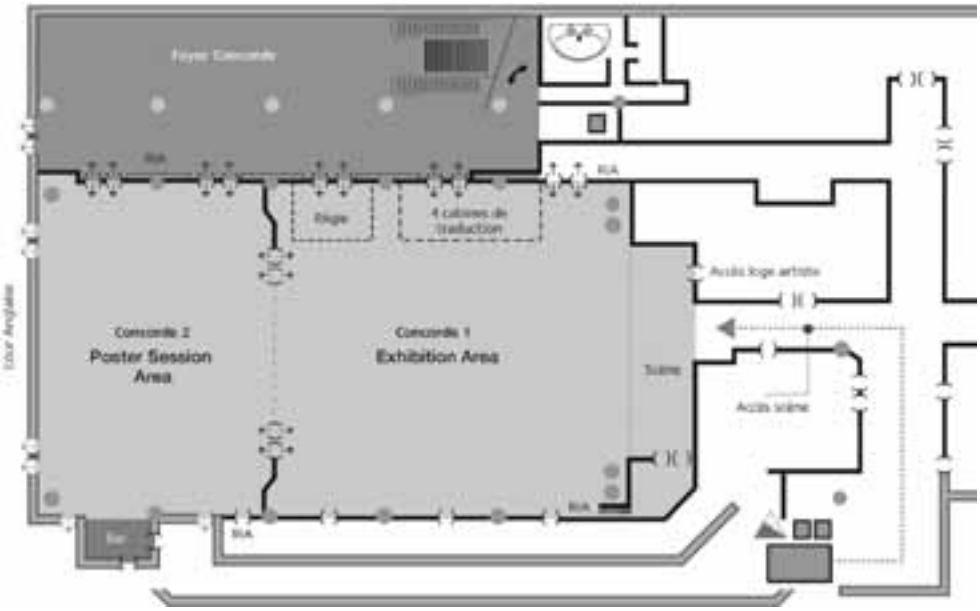
Tuesday: 10.00 - 17.00 hrs.
Wednesday: 10.00 - 16.00 hrs.

Poster Session

Tuesday: 17.45 - 19.15 hrs.

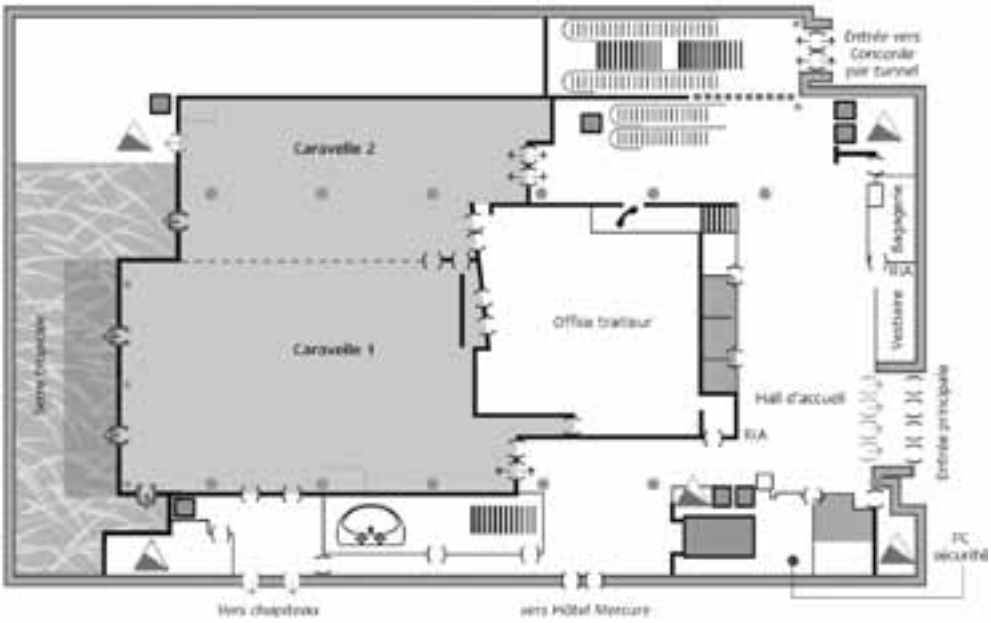
Tuesday/Wednesday Coffee Breaks

10.00 - 11.00 hrs.
15.00 - 16.00 hrs.



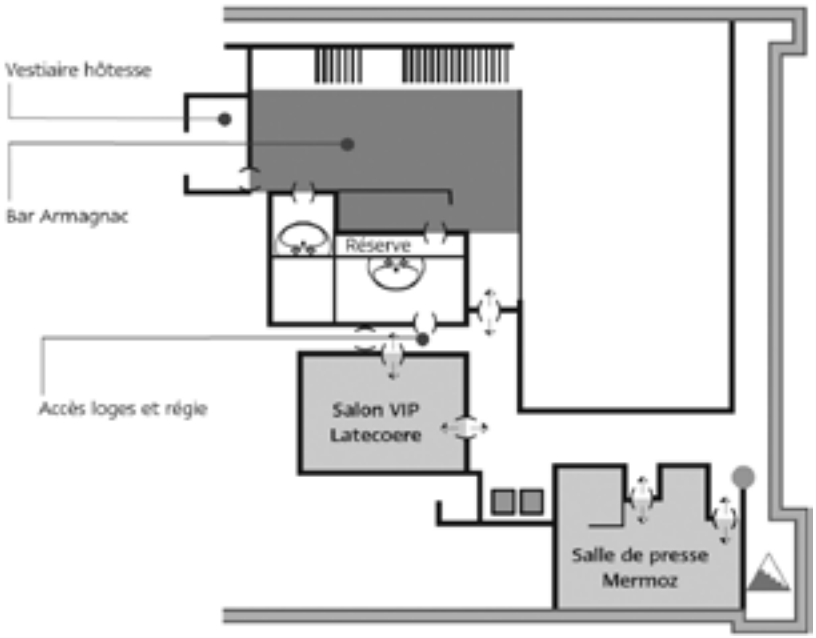
Ground floor:

Registration



Level 0,5

Internet Cafe, AV Preview Room



Level 1

Room Argos:
Conferences 7827, 7835B, 7832

Room Ariane 1:
Conference 7826

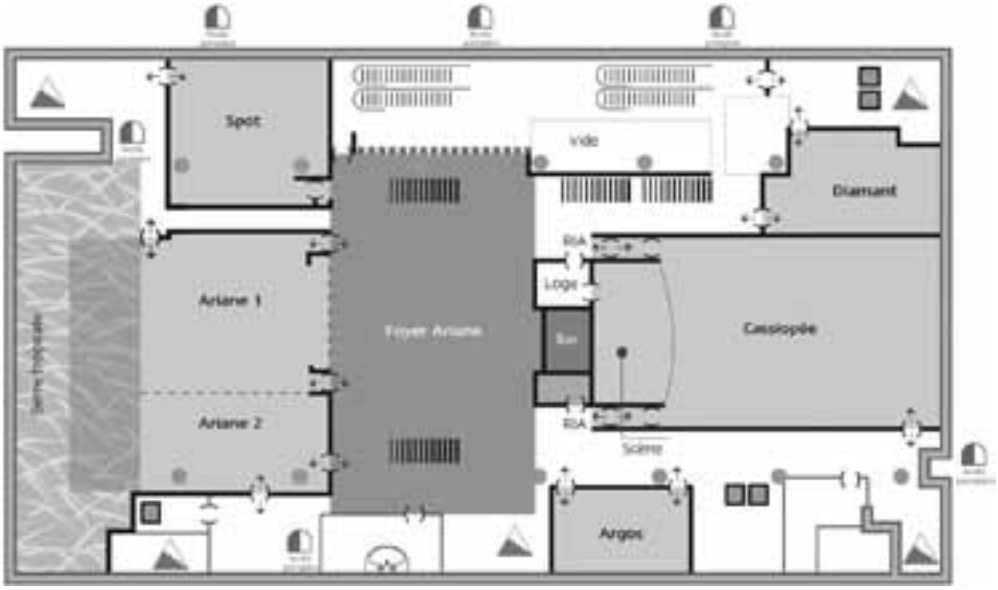
Room Ariane 2:
Conferences 7828, 7834

Room Diamant:
Conferences 7825, Joint Session 7825/7826, 7837

Room Spot:
Conferences 7821, 7830

Monday and Thursday Coffee Break

10.00 - 11.00 hrs.
15.00 - 16.00 hrs.

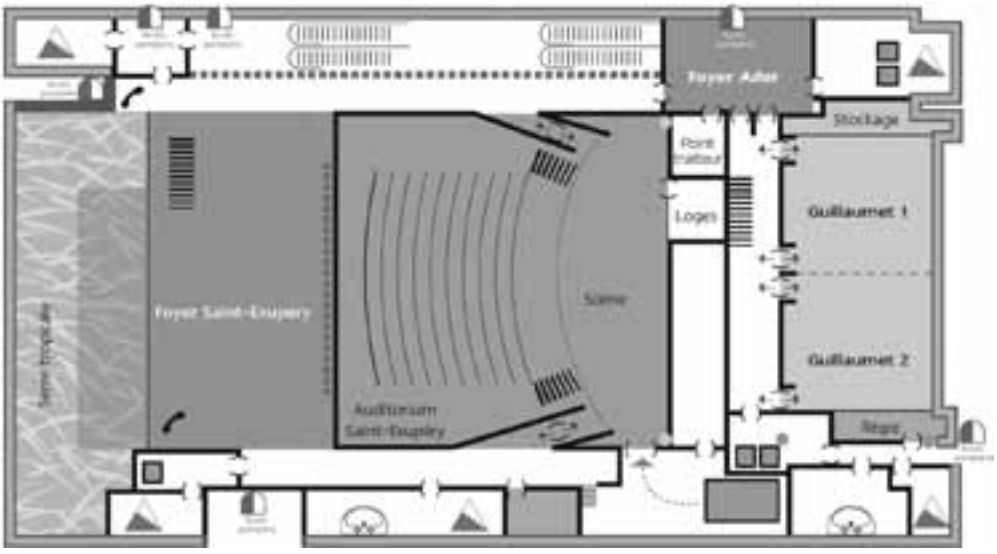


Level 2

Room Guillaumet 1:
Conferences 7833, 7835A

Room Guillaumet 2:
Conferences 7836, 7838A

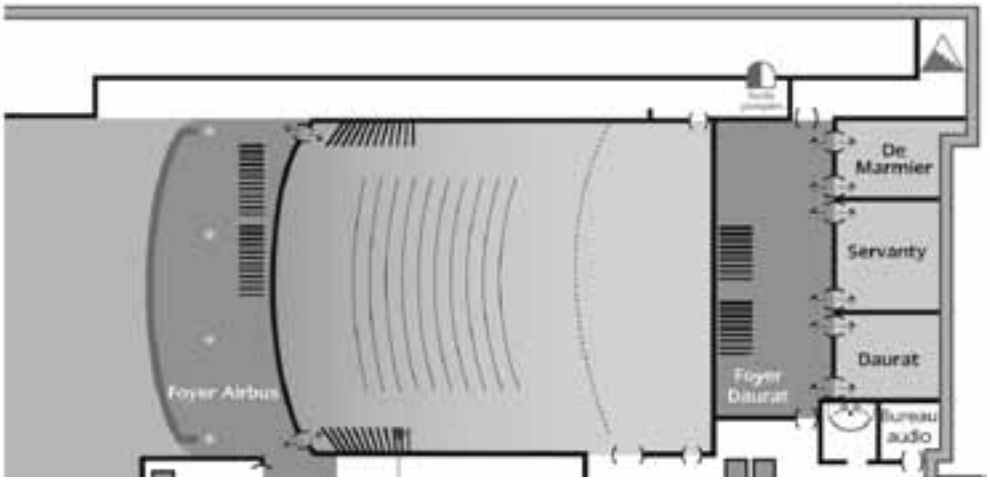
Auditorium St Exupéry:
Plenary Session



Level 3

Room Daurat:
Conferences 7824, 7838B

Room Servanty:
Conference 7831



Daily Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY

Remote Sensing

Conferences

Conf. 7824: **Remote Sensing for Agriculture, Ecosystems, and Hydrology** *(Neale, Maltese)* p. 18

Conf. 7825: **Remote Sensing of the Ocean, Sea Ice, and Large Water Regions 2009** *(Bostater, Mertikas, Neyt, Velez-Reyes)* p. 23

Conf. 7826: **Sensors, Systems, and Next-Generation Satellites** *(Meynart, Neeck, Shimoda*) p. 25

Conf. 7828: **Optics in Atmospheric Propagation and Adaptive Systems** *(Stein, Gonglewski)* p. 34

Conf. 7827: **Remote Sensing of Clouds and the Atmosphere** *(Picard, Comerón, Schäfer, van Weele)* p. 31

Conf. 7830: **Image and Signal Processing for Remote Sensing** *(Bruzzone)* p. 38

Conf. 7829: SAR Image A**nalysis, Modeling, and Techniques** *(Notarnicola)* p. 36

Conf. 7831: **Remote Sensing for Environmental Monitoring, GIS Applications, and Geology** *(Ulrich, Civco)* p. 41

Conf. 7832: **Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing** *(Singh, Pappalardo)* p. 44

Security+Defence

Conferences

Conf. 7833: **Unmanned/Unattended Sensors and Sensor Networks V** *(Carapezza)* p. 53

Conf. 7837: **Passive Millimetre-Wave and Terahertz Imaging and Technology** *(Krapels, Salmon)* p. 63

Conf. 7834: **Electro-Optical and Infrared Systems: Technology and Applications** *(Huckridge)* p. 56

Conf. 7838A: **Optics and Photonics for Counter-Terrorism and Crime-Fighting** *(Lewis)* p. 65

Conf. 7835A: **Electro-Optical Remote Sensing** *(Kamerman, Steinvall, Lewis)* p. 58

Conf. 7835B: **Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing** *(Bishop, Gonglewski)* p. 60

Conf. 7838B: **Optical Materials in Defence Systems Technology** *(Kajzar, Lindgren)* p. 67

Conf. 7836: **Technologies for Optical Countermeasures** *(Titterton, Richardson)* p. 61

Special Events

Joint Session—Conf. 7824 & Conf. 7826, p. 18, 26

SPIE Security + Defence Plenary Session 15.30 to 17.30, p. 6

SPIE Remote Sensing Plenary Session 17.45 to 19.30, p. 7

Welcome Reception 19.45 to 21.30, p. 5

GOSAT Workshop, p. 5

Joint Session— Conf. 7827 & Conf. 7832, p. 5

Posters 17.45 to 19.15, p. x

Joint Session—Conf. 7829 & Conf. 7830, p. x

Joint Session—Conf. 7825 & Conf. 7826, p. 5

EXHIBITION, Tues. 10.00 to 17.00 and Wed. 10.00 to 16.00 p. x

photo courtesy of D-Viet

Welcome Reception

Location: Town Hall, Salle Illustre

Monday 20 September, 19.30 to 21.30

All attendees are invited to relax, socialise, and enjoy light refreshments. Please remember to wear your conference registration badges. Dress is casual.

GOSAT Workshop

Tuesday 21 September, 13.00 to 17.00
Location: Diamant

The Workshop will focus on introduction to GOSAT data and the GOSAT research announcement. Attendance is free of charge and open to all SPIE Remote Sensing and SPIE Security + Defence registered participants.

Round Table Discussion

Tuesday 21 September, 16.30
Location: Guillaumet 2

Conference 7838A, Optics and Photonics for Counterterrorism and Crime Fighting

Security + Defence 2010 is a splendid opportunity for the counter-terrorism and crimefighting delegates to interact with the broader defence community. Following the Monday plenary talk comparing and contrasting crime and security issues with those found in defence, a round table discussion has been scheduled on Tuesday. The discussion is open to everyone; plan to attend and debate real solutions to hard problems. Further opportunity to meet and talk will be around the C-T and crimefighting poster session.

Poster Session

Tuesday 21 September, 17.45 to 19.15

Poster presenters can begin to post their papers at 10.00 on Tuesday. Each poster presenter is provided a space 0.95 x 1.20m in which to display a summary of the paper. Poster presenters will stand by their posters from 17.45 to 19.15 to answer questions. Poster presenters who have not set up by 17.00 on Monday will be considered a “no show” and their manuscript will not be published. Posters must be removed at the end of the poster session since the poster boards will then be removed and the remaining posters discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Joint Sessions

A Special Joint Session on Lidar Measurements during Recent Eyjafjallajökull Volcanic Eruption

Monday 20 September
Location: Argos

Conference 7827, RS of Clouds and the Atmosphere and Conference 7832, Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing

The eruption of the Eyjafjallajökull volcano is a clear example – certainly an extreme one, but of not so small probability – of the impact, direct or indirect, that atmospheric aerosols can have on the daily life of thousands of people and on the economy worldwide. This event has been tracked in Europe by ground-based lidars and other optical remote sensing instruments such as sun-photometers. In particular, the range resolution capability of lidars has allowed gathering four-dimensional (space and time) data on the evolution of the ash clouds, their movement, and their optical properties. The extensive observation made by different lidars throughout Europe, once analyzed and compared, will be of crucial importance in assessing the real impact of the ash and can be used for validation and assimilation into dispersion models. The special session on lidar measurements of the Eyjafjallajökull aerosols will highlight some of the contributions of lidar techniques towards understanding of the event and of its impact.

A Special Joint Session on Airborne Remote Sensing

Thursday 23 September
Location: Diamant

Conference 7826, RS Sensors, Systems, and Next-Generation Satellites and Conference 7225, RS of the Ocean, Sea Ice, and Large Water Regions 2010

This joint session will address airborne remote sensing systems and the use of these systems on aerial platforms.

Monday 20 September 15.30 to 17.15 | Auditorium Saint-Exupéry

Welcome and Introduction
2010 Symposium Chairs

15.30 to 15.40

David H. Titterton, Defence Science and Technology Lab., United Kingdom

Reinhard R. Ebert, Fraunhofer-IOSB Institute of Optronics, System Technologies and Image Exploitation, Germany

Bernard Rosier, ONERA, The French Aerospace Lab., France

15.40 to 16.20

Optronics for Security, Defense and Space Applications

Emmanuel Rosencher, ONERA, Chief Scientist of the Physics Branch, and Professor, Ecole Polytechnique (France)

The challenges of Optronics can be easily described: Observe, detect, identify, localize and measure with the highest accuracy, with the highest informative content, at the largest possible distance, at any time, under any condition in order to anticipate and protect. I shall describe the main lines of Optonics R and D in ONERA, The French Aerospace Lab, dedicated to take up these challenges, mostly active imaging, infrared detection and sources, hyperspectral imaging, lidars, micro-OPOs (optical parametric oscillators), fiber lasers, spectroscopy, cold atoms devices, nano-optics, adaptative optics, … The current frontiers of these different topics will be briefly sketched.

Biography: **Prof. Emmanuel Rosencher** graduated from the Ecole Polytechnique (1975) and the Ecole Supérieure des Télécommunications (1977). He owns a doctorate in Applied Mathematics (Paris, 1978) and a Physics Habilitation degree (Grenoble, 1986). He is a pioneer in the field of nanophysics and quantum devices, with early studies on ultrathin epitaxial metal films which led to Metal Base Transistors and optical properties of quantum wells, which led to the Quantum Well Infrared Photodetector devices (QWIP) as well as new non linear optics devices. He has published more than 160 papers in top international scientific journals (Nature, Science, Applied Physics Letters,..) and filed more than 30 international patents. He has been awarded numerous scientific prizes; he is Chevalier de l'Ordre National du Mérite et de la Légion d'Honneur and is Fellow of the IEEE, Optical Society of America (OSA) and Institute of Physics (IoP). He is also Professor in the Department of Physics at the Ecole Polytechnique (France) , teachning Semiconductor and Optoelectronics device physics. He is Chief Scientist of the ONERA Physics Branch which is conducting research in radars and electromagnetism, optronics, micro and nanotechnologies and space physics.

16.20 to 17.00

European photonics research for security

Jean-Thierry Audren, European R&T Director, Optronics and Defense Division Sagem Defense and Security, France

In most of the European countries support for military optoelectronics R&T is decreasing. As a result, R&T orientation is in the hand of industries that develop technologies strongly tailored to their market need. It is also an incentive to deeper cooperation with research centres and sought of alternative funding sources. European FP7 is one of them. The Photonics21 technology platform is a perfect tool to achieve such results. Photonics21 has recently published its second Strategic Research Agenda (SRA) "Lighting the way ahead" in which sensors and security have a prominent position. The research orientations proposed in the SRA are mainly deriving from market analysis and trends.

After a presentation of the scene, Photonics21 will be presented. General findings of the SRA with a specific focus on sensors and security will be presented showing where the drivers of the future are.

Biography: **Jean-Thierry Audren** graduated as an engineer in 1974 from the "Ecole Nationale Supérieure d'Electronique et d'Electromécanique de Caen". From 1975 to 1992 he worked for SFIM developing navigation and guidance equipment for aeronautics and defence, moving from the position of R&D engineer to head of R&D department. From 1992 to 1999 he was in charge of Research & Technologies at SFIM, including intellectual property management. During this period he extended the photonics portfolio of SFIM thanks to the strong activity of SFIM in defence optronics. From 1999 when SFIM was taken over by Sagem he has continuously been working in Jean-François Coutris (Executive VP, Chief Operating Officer Sagem Optronics and Defence Division) team as Business Development Deputy Director and now as European R&T Director.

Since the beginning of Photonics21, he has been running Working Group 5 and has supervised the writing of both Strategic Research Agendas for WG-5. He has also worked to support Jean-François Coutris in his position as member of the Photonics21 Executive Board. As a result, he has an in-depth experience and knowledge of Photonics21 and the people who are involved in its operations.Jean-Thierry Audren hold 40 patents in avionics and optronics.

17.00 to 17.15

The Hard Problems of Counter-Terrorism and Crime Fighting need Novel Technology Ideas to Solve them: round table discussion preview

Adam Ogilvie-Smith, Office for Security & Counter-Terrorism, United Kingdom

Prof. Ogilvie-Smith will compare fighting crime and countering terrorism with the challenges of the defence environment, and invite cross-fertilisation between the two communities through the mechanism of a round table discussion.

Monday 20 September 17.35 to 19.05 | Auditorium Saint-Exupéry

Welcome and Introduction

2010 Symposium Chairs

17.35. to 17.45

Steven P. Neeck, NASA Headquarters (USA)

Karin Stein, Fraunhofer-IOSB Institute of Optronics, System Technologies and Image Exploitation (Germany)

17.45. to 18.25

The CNES and Earth Observation: Past, Current and Future Perspectives

Pascale Ultré-Guérard, Earth Observation Program at the Strategy and Programs Directorate, CNES, France

The French Earth observation programme is introduced in the present-day context including GMES (Global Monitoring for environment and Security) European programme and GEOSS (Global Earth Observation System of Systems). As a R&D agency, numerous projects at CNES are currently in their preparatory phases. The projects may be designed as contributions to a mission, instruments (IASI for meteorology, Megha Tropiques for water cycle), or platform (e.g. SMOS for soil moisture and salinity), or both (Calipso for clouds), or complete design of the architecture of the mission (e.g. Pléiades for high resolution imagery or Parasol a microsatellite dedicated to aerosols measurement).

CNES has a long tradition in working with the scientific community on innovative concepts (e.g. CFOSAT for sea surface characterization), and a number of these projects have been dedicated to research. Most of the projects presented are carried out in cooperation with the most important players in space today.

The lecture will briefly introduce the CNES, French space agency through a few numbers and facts, and then will focus on the CNES strategy in Earth observation. A summary of the historical success (Meteosat, SPOT family) will be followed with review of the present day projects in exploitation (IASI, Parasol, Calipso, Demeter, SPOT5, Jason), development (SMOS, Megha Tropiques, Swarm, Vénµs, Pléiades, CFOSAT) and in preparation (SWOT, IASI NG, Mistigri). Examples of applications in different areas such as climate change, water cycle, land cover, oceanograph will be given.

Biography: **Pascale Ultré-Guérard** has acted as the Head of Earth Observation Program at the Strategy and Programs Directorate of CNES (French Space Agency) since January 2006. She is in charge of coordinating the CNES space programs (satellites and balloons) related to Earth Observation for research, applications and defense domains. She represents CNES in several assemblies: CEOS, WMO, ESA program board for Earth Observation among others. Pascale Ultré-Guérard manages a team of 12 experts (e.g. oceanography, atmosphere, solid Earth, land monitoring, defense, applications, cartography, European programs).

Prior to 2006 she worked as a Program manager in Solid Earth Sciences and managed several space programs and initiatives at national, European, and international level in the field of Earth sciences and applications, in terms of space mission preparation and data exploitation for the user community. Pascale Ultré-Guérard was in charge of the missions dedicated to Solid Earth and Geodesy: OERSTED, CHAMP, SWARM, DEMETER, DORIS systems, Laser Stations. She was also in charge of the applications of the Earth Observation systems for the Solid Earth (including geohazards) studies in the French scientific community (SPOT, Pléiades HR, Envisat…). She was also secretary of the groups of scientific experts in charge of the evaluation of projects and research proposals submitted to CNES: the group dedicated to Solid Earth Sciences and, at a higher level, the group (TOSCA) covering all the scientific activities in the Earth Observation, which advises the Earth Observation delegation for its scientific program definition.

Pascale Ultré-Guérard received her PhD in geomagnetic field modeling from IPGP, Institut de Physique du Globe de Paris. She worked on the preparation of the OERSTED mission as well as the first OERSTED data before she joined CNES.

18.25 to 19.05

RADARSAT Applications Program: Status and Activities

Vernon Singhroy, Canada Centre for Remote Sensing, Canada

The Canada Centre for Remote Sensing works closely with the Canadian Space Agency to develop Remote Sensing applications for Canadian Government uses. With the launch of RADARSAT-1 in 1995, and RADARSAT 2 in 2007 the Canada Centre for Remote Sensing has developed a number of strategic applications for natural resource management and exploration, climate change, and disaster management. This presentation provides examples of these applications exploring the advanced SAR capabilities of RADARSAT such as high resolution, multi-incidence, polarimetry and interferometry, as well as the synergies with other advanced SAR and optical systems. Future application of RADARSAT constellation proposed to be launched in 2014 for rapid revisits and arctic mapping and monitoring will be presented.

Biography: **Prof Dr Vern Singhroy** is a senior research scientist at the Canada Centre for Remote Sensing in Ottawa, where he is developing Earth Observation (EO) techniques for geological and geohazard applications. He is also the principal scientist for the Canadian Space Agency RADARSAT Constellation to be launched in 2014. He has published extensively in scientific journals, proceedings and books. He was the Editor-in-Chief of the Canadian Journal of Remote Sensing for seven years. Dr Singhroy is also member of the editorial board for the Encyclopaedia of Remote Sensing and several international remote sensing journals. He is Professor of Earth Observation at the International Space University in Strasbourg, France, and Adjunct Professor in Planetary and Earth Sciences at the University of New Brunswick and McMaster Universities in Canada.

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Co-located Events

Conference dates
19–22 September 2011

Clarion Congress Hotel
Prague, Czech Republic

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Exhibition Hours

Level-1

Tuesday 21 September . . . . . .10.00 to 17.00
Wednesday 22 September . . . . . .10.00 to 16.00

Registration Hours

Sunday, 19 September . . . . . 15.00 to 18.00
Monday, 20 September. . . . . 7.30 to 18.30
Tuesday, 21 September . . . . . 8.00 to 17.00
Wednesday, 22 September. . . . . 8.00 to 17.00
Thursday, 23 September. . . . . 8.00 to 16.00

Cashier Services

The SPIE Europe cashier can assist with registration payments, receipts, and badge corrections.

- *Registration Payments* - If you are paying by cash or cheque as part of your onsite registration, wish to add a special event requiring payment, or have questions regarding your registration please see the onsite cashier at the Cashier station at the registration desk.
- *Receipts* - Preregistered attendees who did not receive a receipt prior to the meeting may obtain a new copy of their registration receipt onsite at the Cashier's desk.
- *Badge Corrections* - Attendees who need a correction to their badge information onsite may do so at the Cashier's desk. Please have your badge removed from the badge holder, marked with your changes, and ready to hand to the attendant upon approaching the counter.

Message Centre

The Centre de Congrès Pierre Baudis Centre switchboard number is +33 (0) 5 62304000. Messages will be taken during registration hours. Attendees should check the message boards at the message centre on a daily basis.

Speaker Check In Desk

- All Conference rooms will have a computer workstation, LCD projector, screen, lapel microphone, and laser pointer.
- For pre-presentation checks, presenters may use the AV desk situated in Mermoz room to test their presentation.

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Wireless Internet Services will be available - speed may vary depending on the number of users online. Wired Internet is available in the Latéocère room.

Photography/Video Policy

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Individuals not complying with this policy will be asked to surrender their film and to leave the exhibition hall.

Underage Persons on the Exhibition Floor

For safety and insurance reasons, no person under 16 years old will be allowed on the exhibit floor during move-in and move-out. During open exhibition hours, only children over 12 years old accompanied by an adult will be allowed on the exhibit floor.

No Unauthorized Solicitation in the Exhibition

Please note that while all meeting attendees are invited to the exhibition, any attendee who is observed to be soliciting business in the aisles or other public spaces, in another company's booth, or in violation of any portion of the SPIE Exhibition Policy, will be asked to leave immediately. Additional penalties may be applied. Please report any violations you may observe to show management.

Unsecured Items

Personal belongings such as briefcases, backpacks, coats, book bags, etc. should not be left unattended in meeting rooms or public areas. These items will be subject to removal by security upon discovery.

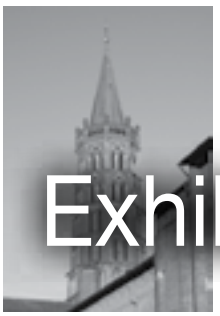

Exhibit Guide

Don’t miss Europe's top Security + Defence exhibiton

Exhibition Hours

Tuesday 21 September . . . . . 10.00 to 17.00
Wednesday 22 September . . . . . 10.00 to 16.00

Exhibitor List *(Current as of 8/18/2010)*

ABB, Analytical Measurement	**#508**
AIM Infrarot-Module GmbH	**#611**
AMS Technologies SARL	**#201**
ASD Inc.	**#402**
BFI OPTiLAS	**#605**
DILAS Diodenlaser GmbH	**#407**
Durham Precision Optics	**#505**
Electro Optics Magazine	**#601**
EM4, Inc.	**#303**
ESL Defence Limited	**#610**
Headwall Photonics	**#502**
HI Tech Detection System (HTDS)	**#608**
IBL Innovative Berlin Laser GmbH	**#406**
IDIL Fibres Optiques	**#205**
Institute for Environmental Solutions	**#105**
Iridian Spectral Technologies	**#204**
ITRES Research Ltd.	**#405**
iXFiber SAS	**#305**
Keopsys	**#504**
Labsphere	**#604**
LightGuideOptics Germany	**#104**
LOT-Oriel	**#103**
MANLIGHT	**#301**
New Imaging Technologies (NIT)	**#603**
NKT Photonics	**#106**
Nufern	**#607**
Ophir Optics Europe GmbH	**#408**
Opton Laser International	**#203**
Optoprim	**#606**
Perkin Elmer	**#609**
PHASICS SA	**#302**
Photoniques	**#101**
Photonis France S.A.S.	**#401**
Picolas GmbH	**#107**
Quantel	**#602**
Raptor Photonics Ltd.	**#102**
SCD-SemiConductor Devices	**#304**
SOFRADIR	**#501**
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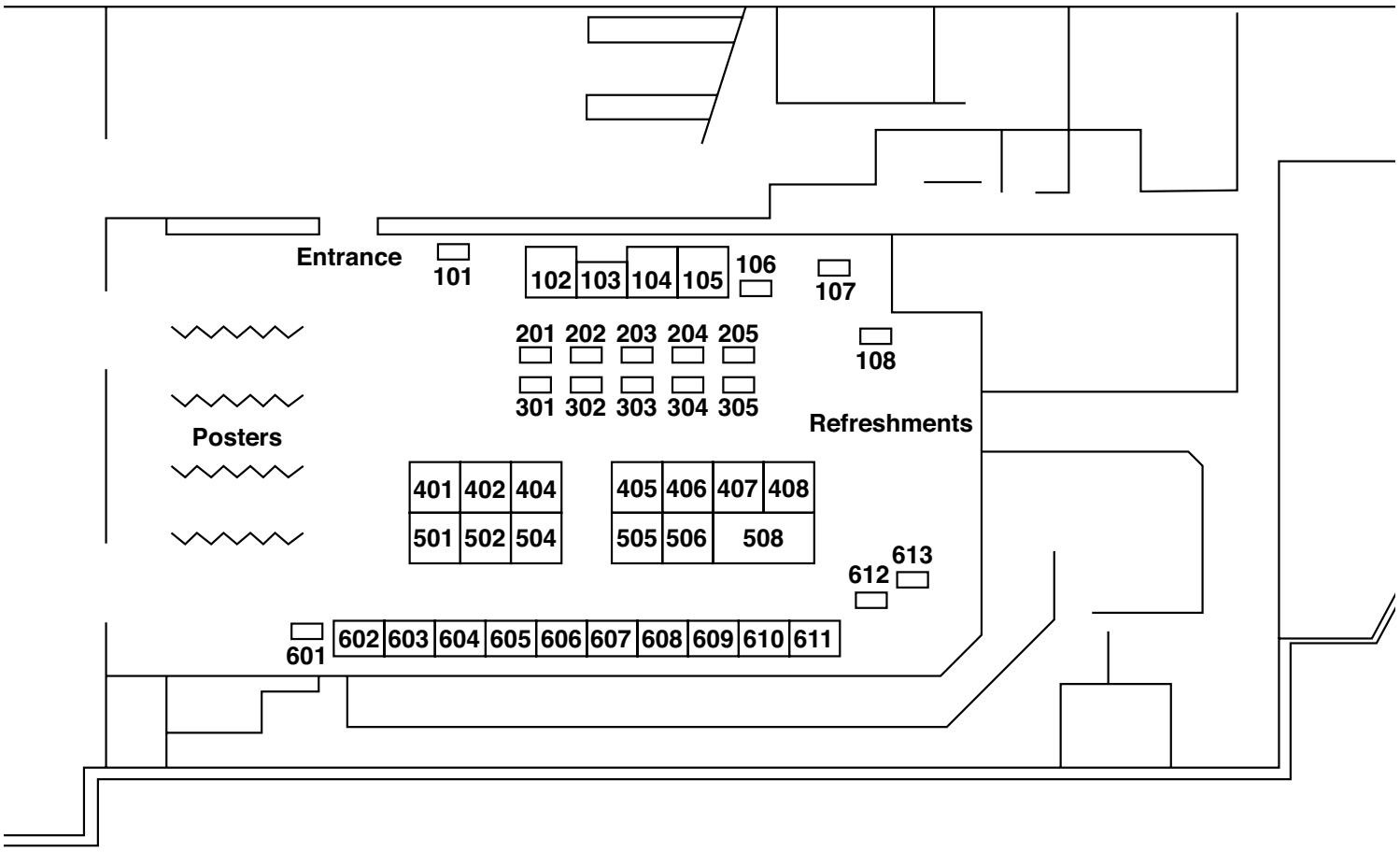

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AIM Infrarot-Module GmbH #611

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AMS Technologies SARL #201

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33164864600; fax 33169078719
fr_info@ams.de; www.ams.de

AMS Technologies is a leading pan-European distributor of high-tech components and systems today. AMS Technologies represents approved global technology leaders and new to market companies that develop innovative, leading edge products in the fields of optoelectronics (lasers, detectors, fiber products), thermal management (heat sinks and water coolers) and high voltage electronics (RF reed relays for military communications). Contact: Sébastien Calanville, Sales Director, scalanville@ams.de.

ASD Inc. #402

SPIE Corporate Member

2555 55th St Ste 100, Boulder, CO, USA, 80301
303/444-6522; fax 303/444-6825
info@asdi.com; www.asdi.com

ASD Inc. is the global leader in high-performance analytical instrumentation solutions, unparalleled in providing laboratory-grade remote sensing and material measurement results in the field and on-site. ASD puts the best, fastest and most accurate spectroscopic instruments to work in more than 70 countries across the world. For more information, please visit www.asdi.com. Contact: Nate Bloomingdale, Technical Sales, nate.bloomindale@asdi.com.

Exhibitor Listings

BFI OPTiLAS #605

La Petite Montagne Sud-Lisses, 4 allee du Cantal, Evry Cedex 1834, France, F-91018
33 1 60 79 59 00; fax 33 1 60 79 89 01
sales@bfioptilas.com; www.bfioptilas.com

DILAS Diodenlaser GmbH #407

SPIE Corporate Member

Galileo-Galilei-Str 10, Mainz-Hechtsheim, Germany, 55129
49 6131 9226 0; fax 49 6131 9226 253
sales@dilas.de; www.DILAS.com

DILAS, the diode laser company, develops and manufactures high-power semiconductor laser components, modules and systems within the industrial and defense markets enabling applications in high-energy lasers, illumination, gated imaging, targeting, range finding, LIDAR and many others. Contact: Dr. Jörg Neukum, Director Marketing & Sales, sales@dilas.de; Marko Hofmann, Sales Engineer, m.hofmann@dilas.de.

Durham Precision Optics #505

Centre For Advanced Instrumentation, Netpark Research Institute, Sedgefield, United Kingdom, TS21 3FB
44(0) 1913344822; fax 44(0) 1913344844
d.j.robertson@durham.ac.uk

Durham Precision Optics offer a service for the Ultra Precision Diamond Machining of optics and optical structures. They have extensive manufacturing, metrology and test capabilities in areas such as diamond machining of freeform surfaces, raster flycutting, ball end milling and ultra precision grinding. DPO have experience across a wide range of applications including ophthalmics, astronomy instrumentation, space optics, solar concentrators, etc. Contact: David Robertson, Professor, d.j.robertson@durham.ac.uk; David Ryder, Precision Engineer, d.a.ryder@durham.ac.uk.

Electro Optics Magazine #601

The Spectrum Building, The Michael Young Centre, Purbeck Rd, Cambridge, United Kingdom, CB2 8PD
44 1223 211170; fax 44 1223 211107
sales@europascience.com; www.electrooptics.com

EM4, Inc. #303

SPIE Corporate Member

7 Oak Park, Bedford, MA, 01730
781/275-7501; fax 781/275-7569
sales@em4inc.com; www.em4inc.com

Manufacturer of high reliability, hermetically packaged, fiber pigtailed and free space optoelectronic components and subsystems for harsh environments: terrestrial, marine and aerospace. Featuring: 100 mW DFB lasers (C and L band, 5 GHz direct mod); 10W multimode pumps(780nm-980nm); 800mW SM pumps (915nm-1064nm); < 10 ns rise/fall time AOM's (530nm, 1060nm & 1550nm); 20 GHz detectors; HP fiber coupled isolators. Contact: Winn Gatewood, CSR, wgatewood@em4inc.com; Basil Garabet, CEO, bgarabet@em4inc.com.

ESL Defence Limited #610

16 Compass Point, Ensign Way, Hamble, Southampton, UK, SO31 4RA
44(0) 23 8045 5110; fax 44(0) 23 8074 4200
esl@esldefence.co.uk; ww.esldefence.co.uk

ESL Defence Limited, a subsidiary of AAI Corporation, is a highly innovative company with capabilities in research, technology, system design, development, manufacturing and product support. ESL are world-leaders in the provision of total-spectrum test equipment for confidence testing, evaluation and training of Defensive Aid Suites and self-protection systems across all domains. Contact: Maria House, Senior Secretary, maria.house@esldefence.co.uk.

Headwall Photonics #502

SPIE Corporate Member

601 River St, Fitchburg, MA, USA, 01420
978/353-4100; fax 978/342-7083
information@headwallphotonics.com;
www.headwallphotonics.com

HI Tech Detection System (HTDS) #608

Parc d'activités du Moulin de Massy, 3, Rue du Saule Trapu – BP 246, MASSY Cedex, FRANCE, 91 882
33 1 6486 2828; fax 33 1 6907 6954
info@hrsa.fr; www.hrsa.fr

IBL Innovative Berlin Laser GmbH #406

Am Schlangengraben 16, Berlin, Germany, 13597
49 30 33774-0; fax 49 30 33774-477
contact@ib-laser.com; www.ib-laser.de

New Product: compact and portable high power Nd:YAG lasers compact pulsed Ho:YAG 120 mJ/100Hz/20 ns.

IB Laser produces diode-pumped solid-state lasers for different applications in industries: machining, semiconductor, LIDAR, air- and spaceborne instruments, in defence and photovoltacis industry and science. We offer continuously pumped q-switched lasers with average powers from 10W up to 400W and pulsed-pumped q-switched lasers with pulse energies of 1 mJ (@ 1064 nm) and 250 µJ (@ 355 mm) at repetition rates of up to 4 kHz and up to 400mJ @ 500Hz (@ 1064 nm), also with single frequency option. Contact: Manuel Toplak, Key Account Manager, contact@ib-laser.com; Anja Fluck, Assistant Marketing & Sales, a.fluck@ib-laser.com.

IDIL Fibres Optiques #205

21 Rue Louis de Broglie, Lannion, France, F-22300
33 2 96 05 40 20; fax 33 2 96 05 40 25
info@idil.fr; www.idil.fr

Institute for Environmental Solutions #105

Lidlauks Priekuli Parish, Priekuli Local Municipality, Latvia, LV-4101
37 1 61127951; fax 37 1 61127955
lidlauks@videsinstituts.lv; www.videsinstituts.lv

New Product: Research flights to test airborne sensors for a wide variety of applications and mapping surveys.

Institute for Environmental Solutions is an applied research organisation focusing on use of airborne remote sensing (lidar, hyperspectral, thermal) for environmental surveys and management of natural resources. IES is developing a flying laboratory for testing different types of sensors and sensor systems for a wide variety of applications. Contact: Inese Suija-Markova, Executive Director, inese.suija@videsinstituts.lv; Gundars Skudrins, Chairman of Board, lidlauks@videsinstituts.lv.

Iridian Spectral Technologies #204

IPF M50, 1200 Montreal Rd, Ottawa, ON, Canada, K1A 0R6
613/741-4513; fax 613/741-9986
Sales@iridian.ca; www.iridian.ca

Iridian Spectral Technologies #204

IPF M50, 1200 Montreal Rd , Ottawa, ON, Canada, K1A 0R6
613/741-4513; fax 613/741-9986
Sales@iridian.ca; www.iridian.ca

IRIDIAN provides optical thin film solutions and coating services. The company is a leading global supplier. Our optical filters and coatings offer the highest levels of performance and durability at competitive prices. From Prototype to volume production. Currently our products cover the wavelength range from 300nm to 2 micrometers. In the development stage we can cover filters up to 15 micrometer in wavelength. Filter sizes vary from sub-millimeter dimensions to 300mm in length. Contact: Nikki Bulgarea, Manager Sales & Marketing, sales@iridian.ca.

ITRES Research Ltd. #405

3553 31st St NW Ste 110, Calgary, AB,
Canada, T2L 2K7
403/250-9944; fax 403/250-9916
info@itres.com; www.itres.com

iXFiber SAS #305

Rue Paul Sabatier, Lannion, France, 22300
33 2 96 04 10 50; fax 33 2 96 04 10 60
info@ixfiber.com; www.ixfiber.com

Keopsys #504

21 Rue Louis de Broglie, Lannion, France, F-22300
33 296 050 800; fax 33 296 050 801
sales@keopsys.com; www.keopsys.com

Labsphere #604

27 Rue Des Clozeaux, Bures Sur Yvette, France, F-91440
33 169072184; fax 33 169077138

Labsphere is a leading provider of instruments and systems designed to simplify light measurement. We design, produce and sell precision radiometric and photometric test and measurement products for applications in the aerospace, electronic imaging, LED, lighting, medical imaging and electro-optics industries. Our employees have a strong commitment to providing the highest level of service, technical and product application support to our customers worldwide. Contact: Nadine Cariou, European Sales Manager, ncariou@labsphere.com; Richard Corbyn, Director of International Business Development, rcorbyn@labsphere.com.

LightGuideOptics Germany #104

Industriestrasse 33, Rheinbach, Germany, 53359
49 22 26 15 85 0; fax 49 22 26 15 85 20
info@lgoptics.de; www.lgoptics.de

New Product: Fused end bundles for high temperature, high power applications like UV curing, oven inspections, lasers.

We are manufacturer of optical fibres for UV and NIR range with different coatings like Acrylate, Nylon, Tefzel, or Polyimide. Optical fibre cables with all known connectors or custom designed solutions. Optical fibre bundles with different terminations like round to round or round to line, fused end bundles, sorted bundles for applications like spectroscopy, analytical measurement, UV curing, high power cables and systems for industrial applications like laser welding or marking. Contact: Peter Taenzer, Manager Sales & Marketing, taenzer@lgoptics.de; Wolfgang Mielke, CEO, mielke@lgoptics.de.

LOT-Oriel #103

Zac de la Bond, 15 rue du Buisson aux Fraises,
Massy, France, F-91300
33 1 69 19 49 49; fax 33 1 69 19 49 30
contact@lot-oriel.fr; www.lot-oriel.fr

LOT-Oriel is a European wide distribution organization specialised in optical equipments and metrology. Since over 30 years, the local presence in the main countries of the EU has been established through local subsidiaries. Each of these offices have their own technical staff for a reliable support and aftersales. The presentation at SPIE in Toulouse will emphasize the new imaging products such as infrared cameras, hyperspectral imaging systems and thermal imaging equipment as well as optical characterizing equipments. Will be shown/supported:

- SWIR and NIR cameras from Xenics, incl. High speed
- Latest generation of MWIR and LWIR cameras from Xenics - Belgium
- Hyperspectral cameras and airborn image acquisition from Specim – Finland
- FTM measuring equipments from Optikos – USA

MANLIGHT #301

4, rue Louis de Broglie, Lannion, France, 22300
33 296 042000; fax 33 29604 2705
info@manlight.com; www.manlight.com

New Product: New low power consumption miniaturized 30µJ 1.5µm pulsed fiber laser.

Manlight, based in Lannion - France, is a leader in designing and manufacturing high power and high performances 1.0µm and 1.5µm pulsed or CW fiber lasers and amplifiers for LIDAR applications. Contact: Bruno LEFEVRE, Sales & Marketing Director, blefevre@manlight-alcen.com.

New Imaging Technologies (NIT) #603

9 rue Charles Fourier, Evry, France, 91000
33 1 60 76 46 48
info@new-imaging-technologies.com;
www.new-imaging-technologies.com

New Product: NSC1001 is an HDR LOG CMOS sensor operating under both rolling and global shutter mode.

New Imaging Technologies (NIT) aims to provide world class design of CMOS optical and imaging sensors to industrial, research, medical and defense organizations around the globe. Contact: Yang Ni, PhD, Chief Technical Officer, yang.ni@new-imaging-technologies.com; Nicolas Baroan, Marketing & Sales Engineer, nicolas.baroan@new-imaging-technologies.com.

NKT Photonics #106

SPIE Corporate Member

Blokken 84, Birkeroed, Denmark, 3460
45 4348 3900; fax 45 4348 3901
laser_sales@nktphotonics.com; http://www.nktphotonics.com

New Product: Koheras Fiber Lasers: precise lasers for Sensing & Defense applications. SuperK White Light Systems.

NKT Photonics A/S is the result of a merger in 2009 between Crystal Fibre A/S and Koheras A/S. NKT Photonics will lead the way in the development of the photonics industry by setting new standards for fiber based lasers and light sources. From the design and manufacture of advanced photonic crystal fibers to the volume production. With over ten years of know-how, IP and experience, NKT Photonics strives to continually be the market leader in everything we do. Contact: Arnaud Bout, Sales Manager France, abo@nktphotonics.com; Chuong Tran, VP Sales & Marketing, cht@nktphotonics.com.

Nufern #607

SPIE Corporate Member

7 Airport Park Rd, East Granby, CT, 06026
860/408-5000; fax 866/844-0210
info@nufern.com; www.nufern.com

Nufern® is a leading U.S. manufacturer of specialty optical fibers, fiber lasers and amplifiers serving diverse markets. Current products include over 300 standard fibers and range from sub-assemblies to complete turn-key fiber lasers and amplifiers. From its headquarters in East Granby, Connecticut, USA, Nufern's integrated fiber and fiber laser teams also provide rapid and cost-effective OEM fiber laser design, assembly and contract manufacturing services. Contact: Kristoff Feliksik, Director Of Sales & Engineering Europe, kfeliksik@nufern.eu; Andrzej Szkotnicki, Sales & Application Engineer Europe, aszkotnicki@nufern.eu.

Ophir Optics Europe GmbH #408

Heinrich-Wild-Strasse 204, Heerbrugg,
Switzerland, CH-9435
41 71 722 2081; fax 41 71 722 2080
ir-optics@ophiropt.ch; www.ophiropt.ch

New Product: New IR-Zoom Lenses for cooled and uncooled detectors. New Anti-Narcissus Hard Carbon Coatings.

IR Lens Systems for 3-5 and 8-12 microns for cooled and uncooled detectors. OEM Lens Systems and Components, either built-to-print or built-to-spec. Advanced designs with aspheric and diffractive elements and highly efficient IR-coatings. Reflective metal optics for VIS and IR. Contact: Gaby Mühle, Marketing & Sales Manager, gaby.muehle@ophiropt.ch.

Opton Laser International #203

Parc Club Orsay Université, 99 Rue Jean Rostand,
Orsay Cedex, France, F-91893
33 1 69410405; fax 33 1 69413290
ventes@optonlaser.com; www.optonlaser.com

Opton Laser is a leading supplier in photonics on the European market. The company offers a rich range of high quality products from the most innovative worldwide manufacturers. We are actively presents on the following markets: SCIENTIFIC–INDUSTRIAL–BIOPHOTONICS - MILITARY–AEROSPACE–TELECOMMUNICATIONS– ENVIRONMENT. Opton Laser is based in Orsay, the heart of the most important scientific community in Europe. We have an international reputation as an exigent and professional partner. Contact: Laurence Duchard, Engineer, laurence.duchard@optonlaser.com.

Optoprim #606

21-23 rue Aristide Briand, Vanves, France, F-92170
33 1 4190 6180; fax 33 1 4190 6189
info@optoprim.com; www.optoprim.com

Perkin Elmer #609

3 rue du Saule Trapu, BP246, Bat HTDS,
Massy Cedex, France, 91882
33 1 6486 2824

PerkinElmer is a leader and pioneer in Optoelectronics components for Remote Sensing and Defense applications. The company design and manufacturing capabilities offers both COTS and custom solutions for optical receivers, Si and InGaAs photodiodes with a specialty on Avalanche Photodiodes, Pulsed Laser Diodes, Pyroelectric and Thermopile sensors. New capabilities are developing for Illumination solutions based on LED custom design.

PHASICS SA #302

XTEC Bât. 404, Campus de L'Ecole Polytechnique, Route de Saclay, Palaiseau, France, 91128
33 1 69 3 89 99/95; fax 33 1 69 3389 88
contact@phasics.fr; www.phasics.fr

New Product: Phasics presents SID4 DWIR: the first dual-band wavefront sensor (3-5µm & 8-14µm) for IR metrology.

PHASICS, a French company based in the Paris region, manufactures high resolution (up to 400x300 simultaneous measurement points) wave front sensors based on its innovative technology: 4-wave lateral shearing interferometry. These solutions answer both scientific and industrial needs and are ideal for laser characterization and optical metrology. PHASICS also proposes adaptive optics loops for laser spot optimization and beam shaping. Contact: Raphael Serra, Technical Sales Engineer, contact@phasics.fr; Marie-Begona Lebrun, General Manager, contact@phasics.fr.

Photoniques #101

52-54 ave du 8 mai 1945, Sarcelles, France, 95200
33 0134 0423 23; fax 33 0134 3813 99
contact@photoniques.com; http://www.photoniques.com

Photonis France S.A.S. #401

B Avenue Roger Roncier, 19100 Brive-La-Gaillerde, France
33 555 863 700; fax 33 555 863 774
sales@photonis.com; www.photonis.com

PHOTONIS develops, produces and markets innovative sensors for detecting and amplifying very low levels of light and radiation Industry and Science, Medical and Night Vision: Image Intensifiers, ICCDs and HPDs, Long-Life™ Microchannel Plates, Channeltron® Electron Multipliers, TOF and Advanced Performance detectors. To see our complete line of products, visit www.photonis.com. Contact: Dr Emile Schyns, Product Manager MCPs and I&S Detectors, e.schyns@photonis.com; Mr Rene Glazenborg, Product Manager IIT and HPDs, r.glazenborg@photonis.com.

Picolas GmbH #107

Kaiserstr. 100, Herzogenrath-Kohlscheid, Germany, 52134
+49 2407 563580; fax +49 2407 5635829
info@picolas.de; www.picolas.de

New Product: Distribution of the high quality diode lasers from Focuslight.

The PicoLAS GmbH is specialized in the development and manufacturing of drivers for diode lasers. PicoLAS's diode laser drivers are compact, efficient, and have achieved a market prominence: They provide extreme short currents and high performance for use with applications of semiconductor lasers. As OEM current sources, they offer the first pulse durations of less than one nanosecond (\<1ns). Contact: Stefan Walter, Head of Sales, swalter@picolas.de; Agnes Voelker, Manager Marketing and Sales, svoelker@picolas.de.

Quantel #602

2 bis ave du Pacifique, Les Ulis Cedex, France, F-91941
33 1 6929 1700; fax 33 1 6929 1729
quantel@quantel.fr; www.quantel.fr

Quantel was founded in 1970 and since then has built up worldwide a strong leading position in the field of solid state lasers. The group employs about 300 people in Europe, USA and Germany. At the headquarters and in its subsidiaries, Quantel designs, manufactures, and markets advanced flash-lamp pumped lasers, diode-pumped solid-state lasers, laser diodes, medical laser systems and fiber-laser solutions for a variety of industrial, scientific, medical, military, and aerospace applications. Contact: Philippe Aubourg, Sales Manager, philippe.aubourg@quantel.fr; Olivier Rabot, Contract Manager, olivier.rabot@quantel.fr.

Raptor Photonics Ltd. #102

Willowbank Business Park, Larne, Country Antrim, Northern Ireland, United Kingdom, BT40 2SF
44 2828 270 141; fax 44 2828 275 685
info@raptorphotonics.com; www.raptorphotonics.com

Raptor Photonics Limited offers a full line of high performance, ultra low light digital & analogue cameras, which are optimized for day/night surveillance, homeland security and scientific applications. Raptor specializes in complete cameras and core engine solutions using EMCCD, CMOS and SWIR sensor technology. The extreme low light capability of Raptor's cameras makes them ideal in a variety of applications, including Border & Coastal Surveillance, Airport & Port Surveillance and Airborne/Land EO systems.

SCD-SemiConductor Devices #304

SPIE Corporate Member

PO Box 2250, Haifa, Israel, IL-31021
972 4 990 2535; fax 972 4 990 2627
marketing@scd.co.il; www.scd.co.il

New Product: PELICAN-D is a 640 x 512 elements, 15µm pitch, InSb 2D MWIR DIGITAL IDCA.

Semi Conductor Devices (SCD) develops and manufactures cooled and uncooled infrared detectors and laser diodes. SCD offers off-the-shelf and custom-designed detectors in various configurations. SCD's products are applied in IR seekers, thermal imagers, smart munitions, night navigation systems, laser rangefinders and laser designators. Among SCD's products: InSb two dimensional arrays 320x256, 640x512 and 1280x1024; MCT 240x1, TDI 288x4 and 480x6, VOx Microbolometers 320x256 and 640x512. Contact: Fabian Schapiro, Marketing Manager, fabian@scd.co.il; Roger Smith, Marketing Manager, roger_smith@scd.co.il.

SOFRADIR #501

43-47 rue Camille Pelletan, Chatenay-Malabry, France, F-92290
33 1 41 13 45 30; fax 33 1 46 61 58 84
sofradir@sofradir.com; www.sofradir.com

New Product: Bicolor VGA format, LWIR VGA format, MWIR VGA format with digital interface.

Sofradir is the No. 1 supplier in Europe for 2nd and 3rd generation IR MCT detectors and the No. 2 ranking worldwide. With its subsidiaries ULIS and Sofradir EC, the group employs 500 people for a revenue of 120 M€. Sofradir's detectors are battlefield proven and operating in space. They include linear arrays and staring arrays, from ultracompact and low power Epsilon (384x288 15µm pitch) to JUPITER (1280x1024 15µm pitch), and many custom design products. Contact: Marc Larive, Marketing Manager, marc.larive@sofradir.com; Jacques Chautemps, Sales for Space Projects, jacques.chautemps@sofradir.com.

Spiricon GmbH #408

An der Strusbek 60-62, Ahrensburg, Germany, D-22926
49 4102 6671802; fax 49 4102 6671803
sales@spiricon.com; www.spiricon.de

New Product: XEVA InGaAs systems with BeamGage software, Pyrocam III with BeamGage software.

Spiricon GmbH as member of the Ophir group markets Europe-wide the Ophir-Spiricon laser beam analysers which are camera based systems for complete beam diagnosis in real-time. The wavelength range is from UV to FIR and includes Pyroelectric as well as InGaAs matrix detectors. All measurements are based on Spiricon's patented Ultracal offset correction which strictly conforms to ISO 11146-3:2004. M2 measurements are included. Contact: Juergen Reingruber, General Manager, reingruberj@spiricon.de.

SwissOptic AG #404

Heirich-Wild-Str, Heerbrugg, Switzerland, CH-9435
41 71727 3074; fax 41 71727 4686
swissoptic@swissoptic.com; www.swissoptic.com

SwissOptic AG - Solutions in Optics. The Berliner Glas Group is one of the leading European providers of optical key components, assemblies and systems. With our understanding of optical systems and optical production techniques, we develop and integrate optics, mechanics and electronics into innovative system solutions. These solutions are applied in e.g. observation devices, target- and fire-control systems, armored vehicles or head-up displays for helicopters and jets. Contact: Dario Fusinato, Sales Manager, dario.fusinato@swissoptic.com; Hans-Peter Stäheli, Sales Manager, hans-peter.staeheli@swissoptic.com.

ULIS #202

PO Box 27 Zone Industrielle, Veurey Voroize, France, F-38113
33 4 76 5374 70; fax 33 4 76 5374 80
ulis@ulis-ir.com; www.ulis-ir.com

New Product: ULIS' PICO640 17 micron LWIR is a 640 x 480 video quality (VGA) infrared sensor.

ULIS manufactures high-volume infrared detectors for low-cost, low power, lightweight IR cameras. It offers a range of small and large form factor IR products for industrial, professional and security applications. ULIS' IR detectors are key components of IR equipment increasingly used in energy audits in buildings, thermography, security & surveillance and night vision driving for motor vehicles, as well as fire-fighting and lightweight military equipment. Contact: Jean-Louis Lauront, Sales Engineer, ulis@ulis-ir.com.

Product Categories

Astronomy
Durham Precision Optics

Cameras and CCD Components
Photonis France S.A.S.
Spiricon GmbH
SwissOptic AG
ULIS

Chemical & Biological Sensing
ABB, Analytical Measurement
Opton Laser International

Displays
SwissOptic AG

Distributor or Reseller
Opton Laser International

Electronic Imaging Components, Equipment, Systems
ABB, Analytical Measurement
AIM Infrarot-Module GmbH
New Imaging Technologies (NIT)
Spiricon GmbH
ULIS

Fiber Optic Components, Equipment, Systems
AMS Technologies SARL
LightGuideOptics Germany
NKT Photonics

Finished Optics, Filters, & Coatings, Optical Fabrication Equipment
Ophir Optics Europe GmbH
SwissOptic AG

High Speed Imaging and Sensing
ABB, Analytical Measurement
AIM Infrarot-Module GmbH
ASD Inc.
Labsphere
Nufern

Infrared Sources, Detectors, Systems
ABB, Analytical Measurement
AIM Infrarot-Module GmbH
AMS Technologies SARL
ASD Inc.
DILAS Diodenlaser GmbH
NKT Photonics
Ophir Optics Europe GmbH
Opton Laser International
PHASICS
SCD-SemiConductor Devices
SOFRADIR
Spiricon GmbH
ULIS

Lasers and Other Light Sources, Laser Accessories, Laser Systems
AMS Technologies SARL
DILAS Diodenlaser GmbH
EM4, Inc.
ESL Defence Limited
IBL Innovative Berlin Laser GmbH
LightGuideOptics Germany
MANLIGHT
NKT Photonics
Nufern
Opton Laser International
Quantel
SCD-SemiConductor Devices

Law Enforcement Technologies
AIM Infrarot-Module GmbH
ULIS

Life Sciences
EM4, Inc.
NKT Photonics

Metrology, Inspection and Process Control
Durham Precision Optics
PHASICS

Optical Components
AMS Technologies SARL
Durham Precision Optics
ESL Defence Limited
Nufern
Ophir Optics Europe GmbH
Opton Laser International
SwissOptic AG

Optical Detectors
ESL Defence Limited
New Imaging Technologies (NIT)
PHASICS
Photonis France S.A.S.
SOFRADIR

Optical Fibers
LightGuideOptics Germany
NKT Photonics
Nufern

Optical Test and Measurement Equipment, Interferometer
ABB, Analytical Measurement
AMS Technologies SARL
ESL Defence Limited
Labsphere

New Imaging Technologies (NIT)
PHASICS
Spiricon GmbH

Optics Manufacturing
Durham Precision Optics
Ophir Optics Europe GmbH
SwissOptic AG

Photonics Equipment Manufacturer
Labsphere

Sensor & Sensor Systems
ESL Defence Limited
Institute for Environmental Solutions
Labsphere
LightGuideOptics Germany
New Imaging Technologies (NIT)
Nufern
PHASICS
Photonis France S.A.S.
SCD-SemiConductor Devices
Spiricon GmbH
ULIS

Software
Institute for Environmental Solutions

Vacuum, Cooling, Gas Handling Equipment
AIM Infrarot-Module GmbH

SPIE Remote Sensing

Conferences: 20-23 September 2010
Exhibition: 21-22 September 2010

Centre de Congrès Pierre Baudis
Toulouse, France

Steven P. Neeck
NASA Headquarters (USA)
2010 Symposium Chair

Karin Stein
Fraunhofer-IOSB Institute of Optronics, System Technologies and Image Exploitation
2010 Symposium Co-Chair

Technical Conferences

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Remote Sensing for Agriculture, Ecosystems, and Hydrology

Conference Chairs: **Christopher M. U. Neale,** Utah State Univ. (USA); **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

Conference Co-Chair: **Katja Richter,** Ludwig-Maximilians-Univ. München (Germany)

Programme Committee: **Guido D'Urso,** Univ. degli Studi di Napoli Federico II (Italy); **Richard A. M. de Jeu,** Vrije Univ. Amsterdam (Netherlands); **Goffredo La Loggia,** Univ. degli Studi di Palermo (Italy); **Francesco Vuolo,** Univ. of Southampton (United Kingdom)

Monday 20 September

Opening Remarks

Room: Servanty . . . . . Mon. 08.30 to 08.40

Antonino Maltese, Univ. degli Studi di Palermo (Italy)

SESSION 1

Room: Servanty . . . . . Mon. 08.40 to 10.00

Land Use and Change Detection

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

08.40: **Quantification and assessment of urban surface reflection ratios and their effect on aerosol retrieval using high spatial resolution LANDSAT retrievals**, Barry Gross, Ana Picon, Madhalvan Bomidi, Fred Moshary, Samir Ahmed, The City College of New York (United States) . . . . . [7824-01]

09.00: **Mapping of large irrigated areas in central Asia using MODIS timeseries**, Miriam Machwitz, Jan Boethe, Doris Klein, Christopher Conrad, Julius-Maximilians-Univ. Würzburg (Germany); Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . [7824-02]

09.20: **Analysis of vegetation pasture climate response on Sahel region through long term remote sensing information**, Mirco Boschetti, Pietro A. Brivio, Consiglio Nazionale delle Ricerche (Italy); Etienne Bartholome, European Commission Joint Research Ctr. (Italy); Francesco Nutini, Stefano Bocchi, Univ. degli Studi di Milano (Italy) . . . . . [7824-03]

09.40: **Characteristics of vegetation coverage variations and numerical simulation on the impact of its on regional climate in Huanghe-Huaihe-Haihe zone**, Huailiang Chen, Zixuan Du, Henan Institute of Meteorological Science (China) and Key Lab. of Agrometeorological Safeguard and Applied Technique (China); Ziping Zhou, Henan Meteorological Bureau (China); Zhongyang Liu, Henan Institute of Meteorological Science (China) and Key Lab. of Agrometeorological Safeguard and Applied Technique (China); Yantao Wei, Henan Meteorological Bureau (China) . . . . . [7824-04]

Coffee Break . . . . . 10.00 to 10.20

SESSION 2

Room: Servanty . . . . . Mon. 10.20 to 12.30

Biophysical Vegetation Variable Retrieval

Session Chair: **Katja Richter,** Ludwig-Maximilians-Univ. München (Germany)

10.20: **TBA** *(Invited Paper)***,** Fred Baret, Ctr. de Recherches d'Avignon (France) . . . . . [7824-104]

10.50: **Preparatory analyses and development of algorithms for agricultural applications in the context of the EnMAP hyperspectral mission**, Katja Richter, Tobias Hank, Wolfram Mauser, Ludwig-Maximilians-Univ. München (Germany). . . . . [7824-06]

11.10: **Changes in vegetation greenness following the 2006 drought in the southeast United States**, Sergio Bernardes, Marguerite Madden, The Univ. of Georgia (United States) . . . . . [7824-07]

11.30: **Statistical derivation of fPAR and LAI for irrigated cotton and rice in Uzbekistan by combining multi-temporal Rapid Eye data and ground measurements**, Andrea Ehammer, Julius-Maximilians-Univ. Würzburg (Germany) and Univ. Innsbruck (Austria); Sebastian Fritsch, Christopher Conrad, Julius-Maximilians-Univ. Würzburg (Germany); John Lamers, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7824-08]

11.50: **Carbon partitioning as validation methods for crop yield and CO_2 sequestration monitoring in Asia using a photosynthetic-sterility model**, Daijiro Kaneko, Matsue National College of Technology (Japan) and Remote Sensing Environmental Monitor, Inc. (Japan); Peng Yang, Chinese Academy of Agricultural Sciences (China) and Chinese Academy of Agricultural Sciences (China); Toshiro Kumakura, Nagaoka Univ. of Technology (Japan) . . . . . [7824-09]

12.10: **Inter-annual variation of NDVI over Korea Peninsula using harmonic analysis**, In-hwan Kim, Kyung-Soo Han, Kyoung-Jin Pi, Soo-Jae Park, Sang-il Kim, Pukyong National University (Korea, Republic of) . . . . . [7824-10]

Lunch Break . . . . . 12.30 to 13.40

SESSION 3

Room: Servanty . . . . . Mon. 13.40 to 14.40

Drought and Crop Monitoring

Session Chair: **Francesco Vuolo,** Univ. of Southampton (United Kingdom)

13.40: **Mapping crop distribution in administrative districts of southwest Germany using multi-sensor remote sensing data**, Achim Goessl, Christopher Conrad, Julius-Maximilians-Univ. Würzburg (Germany); Annekatrin Metz, Thomas Esch, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Christoph Konrad, European Institute for Energy Research (Germany); Gerold Goettlicher, EnBW Energie Baden-Württemberg AG (Germany); Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7824-11]

14.00: **A case study on the early warning of agricultural drought**, Jinlong Fan, Xiaoyu Zhang, China Meteorological Administration (China) . . . . . [7824-90]

14.20: **Airborne multispectral and thermal remote sensing for detecting the onset of crop stress caused by multiple factors**, Yanbo Huang, Steven J. Thomson, USDA Agricultural Research Service (United States) . . . . . [7824-13]

SESSION 4

Room: Servanty . . . . . Mon. 14.40 to 17.30

Joint Session: SMOS

Session Chairs: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy); **Yann H. Kerr,** Ctr. d'Etudes Spatiales de la Biosphère (France)

Joint Session with Conference 7826, Sensors, Systems, and Next-Generation Satellites

14.40: **SMOS: from concept to operations and from operation to the next generation** *(Invited Paper)*, Yann H. Kerr, Ctr. National d'Études Spatiales (France); Philippe Waldteufel, Lab. des Sciences du Climat et de l'Environnement (France); Francois Cabot, Bernard Rougé, Ctr. d'Etudes Spatiales de la Biosphère (France); Eric Anterrieu, Univ. de Toulouse (France); Philippe Richaume, Ctr. d'Etudes Spatiales de la Biosphère (France); Achim R. Hahne, Susanne Mecklenburg, European Space Research and Technology Ctr. (Netherlands) . . . . . [7826-82]

15.10: **SMOS's first in flight results**, Yann H. Kerr, Ctr. National d'Études Spatiales (France); Philippe Waldteufel, Lab. des Sciences du Climat et de l'Environnement (France); Philippe Richaume, François Cabot, Ctr. National d'Études Spatiales (France); Jordi Font, Institut de Ciències del Mar (Spain); Steven Delwart, Achim R. Hahne, European Space Research and Technology Ctr. (Netherlands); Susanne Mecklenburg, European Space Research and Technology Ctr. (Italy). . . . . [7824-14]

Coffee Break . . . . . 15.30 to 15.50

15.50: **Global soil moisture maps using SMOS**, Yann H. Kerr, Philippe Richaume, François Cabot, Ctr. National d'Études Spatiales (France); Philippe Waldteufel, Lab. des Sciences du Climat et de l'Environnement (France); Jean Pierre Wigneron, Institut National de la Recherche Agronomique (France); Ali Mahmoodi, Array Systems Computing, Inc. (Canada) . . . . . [7824-15]

16.10: **SMOS soil moisture values evaluation over Sahelian area**, Claire Gruhier, Ctr. d'Etudes Spatiales de la Biosphère (France); Thierry Pellarin, Univ. de Grenoble (France); Yann H. Kerr, Ctr. d'Etudes Spatiales de la Biosphère (France); Manuela Grippa, Univ. Paul Sabatier (France) . . . . . [7824-16]

16.30: **Disaggregation as a top-down approach for evaluating 40 km resolution SMOS data using point-scale measurements: application to AACES'10**, Olivier Merlin, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-17]

16.50: **Event detection of hydrological processes with passive L-band data from SMOS**, Ahmad AlBitar, Elsa Jacquette, Yann H. Kerr, Arnaud Mialon, François Cabot, Ctr. d'Etudes Spatiales de la Biosphère (France); Arnaud Quesney, Capgemini Sud (France); Philippe Richaume, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-18]

17.10: **SMOS CATDS level 3 global products over land, Jacquette Elsa, Ahmad AlBitar,** Arnaud Mialon, Yann H. Kerr, Ctr. d'Etudes Spatiales de la Biosphère (France); Quesney Arnaud, Capgemini Sud (France); François Cabot, Philippe Richaume, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-19]

Remote Sensing Plenary Session

Monday 20 September, 17.35 to 19.05

For details see page 7

Tuesday 21 September

SESSION 5

Room: Daurat . . . . . Tues. 9.00 to 10.00

Lidar and Radar Applications in Hydrology I

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

09.00: **Agricultural vegetation classification with SVM and polarimetric SAR data**, Sandrine Daniel, Ctr. d'Etudes Spatiales de la Biosphère (France) and ONERA (France); Sebastien Angelliaume, ONERA (France); Sophie Allain-Bailhache, Univ. de Rennes 1 (France); Pascale Dubois-Fernandez, ONERA (France); Eric Pottier, Univ. de Rennes 1 (France) . . . . . [7824-20]

09.20: **Remote sensing of arboreous plants by laser induced fluorescence technique**, Oleg Romanovskii, Olga V. Kharchenko, Anatolii I. Grishin, Gennadii G. Matvienko, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) . . . . . [7824-21]

09.40: **Assessment of ENVISAT ASAR data for rice monitoring based on three years experiments**, Xiaoyan Zhao, Shenbin Yang, Shuanghe Shen, Nanjing Univ. of Information Science & Technology (China); Bin Bai Li, Jiangsu Academy of Agricultural Sciences (China) . . . . . [7824-22]

Coffee Break . . . . . 10.00 to 10.30

SESSION 6

Room: Daurat . . . . . Tues. 10.30 to 12.10

Lidar and Radar Applications in Hydrology II

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

10.30: **P-band SAR study of tropical forest in French Guyana**, Sandrine Daniel, Ctr. d'Etudes Spatiales de la Biosphère (France) and ONERA (France); Pascale Dubois-Fernandez, ONERA (France); Thuy Le Toan, Ctr. d'Etudes Spatiales de la Biosphère (France); Jérome Chave, Ctr. Interuniversitaire de Calcul de Toulouse (France); Lilian Blanc, CIRAD (French Polynesia); Malcolm W. J. Davidson, European Space Research and Technology Ctr. (Netherlands) . . . . . [7824-24]

10.50: **Evaluating TerraSAR-X for the identification of tillage occurrence over an agricultural area in Canada**, Anna M. Pacheco, Agriculture and Agri-Food Canada (Canada) . . . . . [7824-25]

11.10: **Tree crown detection in high resolution optical and LIDAR images of tropical forest**, Jia Zhou, Univ. Montpellier 2 (France) and INRIA Sophia Antipolis - Méditerranée (France); Christophe Proisy, Institut de Recherche pour le Développement (France); Xavier Descombes, Josiane B. Zerubia, INRIA Sophia Antipolis - Méditerranée (France); Pierre Couteron, Institut de Recherche pour le Développement (France) . . . . . [7824-27]

11.30: **Successful strategies for using LiDAR to characterize particles from point and diffuse area sources**, Michael D. Wojcik, Christian Marchant, Kori D. Moore, Randal S. Martin, William C. Bradford, Utah State Univ. (United States) . . . . . [7824-28]

11.50: **TBA**

Lunch/Exhibition Break . . . . . 12.10 to 13.30

SESSION 7

Room: Daurat . . . . . Tues. 13.30 to 15.20

Energy Balance and Evapotranspiration

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

13.30: **Surface flux processes and evolution of characteristic eddy scales over dry land and irrigated surfaces in response to saturation deficit advection** *(Invited Paper)*, John H. Prueger, Joe Alfieri, William P. Kustas, Agricultural Research Service (United States); Lawrence E. Hipps, Christopher M. U. Neale, Utah State Univ. (United States); Jerry L. Hatfield, Agricultural Research Service (United States) . . . . . [7824-29]

14.00: **Estimation of crop water requirements using remote sensing and geographic information system**, Mohammed A. El-Shirbeny, NARSS (Egypt) . . . . . [7824-61]

14.20: **Application of SEBAL for estimating crop evapotranspiration over Cyprus: the case of groundnuts in the district of Pafos, Cyprus**, Giorgos C. Papadavid, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [7824-31]

14.40: **Water and energy balance modelling of agricultural areas by remote sensing**, Ana Andreu, Univ. de Córdoba (Spain); M. Patrocinio González-Dugo, Francisco Muñoz-Padilla, Pedro Gavilán, Instituto de Agricultura Sostenible (Spain); María José Polo-Gómez, Univ. de Córdoba (Spain) . . . . . [7824-32]

15.00: **A critical analysis of three remote sensing-based actual evapotranspiration assessment methods over sparse agricultural areas**, Carmelo Cammalleri, Giuseppe Ciraolo, Goffredo La Loggia, Mario Minacapilli, Univ. degli Studi di Palermo (Italy) . . . . . [7824-33]

Coffee Break . . . . . 15.20 to 15.50

SESSION 8

Room: Daurat . . . . . Tues. 15.50 to 17.50

Precision Farming and Irrigation Management

Session Chair: **Katja Richter,**
Ludwig-Maximilians-Univ. München (Germany)

15.50: **Evaluation of new remote sensing systems for the estimation of crop water requirements in precision farming**, Francesco Vuolo, Univ. of Southampton (United Kingdom); Katja Richter, Ludwig-Maximilians-Univ. München (Germany); Carlo De Michele, Ariespace s.r.l. (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy)[7824-34]

16.10: **A national system for monitoring the population of agricultural pests using an integrated approach of remote sensing data from in-situ automated traps and satellite images**, Panayiotis Philimis, Elias Psimolophitis, CNE Technology Ltd. (Cyprus); George M. Georgiou, Novatex Solutions Ltd. (Cyprus); Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Cyprus Univ. of Technology (Cyprus) . . . . . [7824-35]

16.30: **Spectral vegetation indices from field spectroscopy intended for evapotranspiration purposes for spring potatoes in Cyprus**, Giorgos C. Papadavid, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [7824-36]

16.50: **Using remote sensing indices to discriminate irrigated from rainfed cropping in a temperate climate: a case study of potatoes in England**, Shamal Mohammed, Keith Weatherhead, Jerry Knox, Cranfield University (United Kingdom) . . . . . [7824-37]

17.10: **Estimating leaf area index considering the crop geometry effection**, Wenjiang Huang, National Engineering Research Ctr. for Information Technology in Agriculture (China) . . . . . [7824-38]

17.30: **Early detection of Ganoderma boninense: continuum removed analysis of the oil palm hyperspectral properties,** Nisfariza Mohd Noor Maris, Univ. of Malaya (Malaysia); Michael D. Steven, Doreen S. Boyd, Univ. of Nottingham (United Kingdom); Idris Abu Seman, Malaysian Palm Oil Board (Malaysia); Helmi Zulhaidi Mohd Shafri, Univ. Putra Malaysia (Malaysia). . . . . [7824-39]

Posters—Tuesday
Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Energy Balance and Evapotranspiration

Estimation of crop water requirements using remote sensing and geographic information system, Mohammed A. El-Shirbeny, NARSS (Egypt) . . . . . [7824-61]

Modeling the gap fraction and bidirectional gap fraction of discontinuous canopies, Feng Zhao, Zheng Ji, Beijing Univ. of Aeronautics and Astronautics (China) . . . . . [7824-62]

In-situ hyperspectral data analysis for varied coverage estimation of submerged plant Vallisneria spiralis in Hangzhou Bay Wetland, Qian Cheng, Xiuju Wu, Zhejiang Gongshang University (China) . . . . . [7824-63]

Quantitative estimation of chlorophyll a and total suspended matter concentration using Quickbird image and field spectral features in Hangzhou Bay, China, Xiuju Wu, Zhejiang Gongshang Univ. (China); Qian Cheng, Zhejiang Gongshang University (China) . . . . . [7824-64]

Dynamic thresholds for land surface change detection using image differencing, Sangill Kim, Kyung-Soo Han, In-Hwan Kim, Jong-Min Jong-Min, Kyoung-Jin Pi, Pukyong National University (Korea, Republic of) . . . . . [7824-65]

Analysis of the spectral response of Tamarix spp vegetation to the soil saline based on ground spectral measurements, Guli Jiapaer, Xinjiang Institute of Ecology and Geography (China) . . . . . [7824-66]

Precision Farming and Irrigation Management

Polarimetric millimetre wave SAR for precision farming applications, Helmut W. Essen, Dirk Nüssler, Christian Krebs, Hartmut Schimof, Winfried Johannes, Alfred Wahlen, Fraunhofer FHR (Germany) . . [7824-67]

Study on prediction model of rice yield under high temperature stress with hyperspectral remote sensing, Xiaojin Xie, Shenbin Yang, Shuanghe Shen, Ying Xue Li, Nanjing Univ. of Information Science & Technology (China); Bin Bai LI, Jiangsu Academy of Agricultural Sciences (China) . . . . . [7824-68]

MODIS estimates of annual evapotranspiration of irrigated crops in the Nile delta based on the FAO method: application to the Nile river budget, Vincent Simonneaux, Ctr. d'Etudes Spatiales de la Biosphère (France); Mohamed Abdrabbo, Samir Saleh, Mosaad Kotb Hassanein, Central Lab. for Agricultural Climate (Egypt); Abdelghani Chehbouni, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-69]

Land Use and Change Detection

Use of satellite remote sensing for analysis of environmental impacts due to urbanization, Maria A. Zoran, National Institute of Research & Development for Optoelectronics (Romania) . . . . . [7824-70]

A research on IKONOS shadow extraction in urban region based on the principal component fusion information distort, Cunjun Li, Jihua Wang, Xingang Xu, Wenjiang Huang, National Engineering Research Ctr. for Information Technology in Agriculture (China). . . . . [7824-72]

Quality evaluation of MODIS time series filtering techniques, Katja Richter, Ludwig-Maximilians-Univ. München (Germany); Clement Atzberger, European Commission Joint Research Ctr. (Italy). . . . [7824-73]

Denoising and wavelet-based feature extraction of time-series MODIS NDVI and application in land use/land cover mapping in agricultural region, Shengwei Zhang, Suying Chen, Zhen Wang, Yuping Lei, Institute of Genetics and Developmental Biology (China) . . . [7824-74]

Summertime thermal environment characteristics in the central Korea using Landsat TM data, Jinki Park, Jong Hwa Park, Sang Il Na, Chungbuk National Univ. (Korea, Republic of) . . . . . [7824-75]

Estuarine and Coastal Applications

Spectroradiometric characteristics of inland water bodies infestated by Oscillatoria Rubescens algae, Giuseppe Ciraolo, Goffredo La Loggia, Antonino Maltese, Univ. degli Studi di Palermo (Italy) . . . . . [7824-76]

Trophic level evolution of Valencia lake using remote sensing, Carmen I. Goitia, Fundación Instituto de Ingeniería (Venezuela) . . . . . [7824-77]

Coupling a hydro-maritime model and remotely sensed techniques to assess the shoreline positioning uncertainty: the Marsala coast study case, Giorgio Manno, Carlo Lo Re, Giuseppe Ciraolo, Antonino Maltese, Univ. degli Studi di Palermo (Italy). . . . . [7824-78]

Hydrological and Ecosystem Modelling

Use of SPOT-VEGETATION data for the monitoring of snow-covered areas over the Moroccan High-Atlas mountain range, Abdelghani Boudhar, Univ. Cadi Ayyad (Morocco); Benoit Duchemin, Ctr. d'Etudes Spatiales de la Biosphère (France); Lahoucine Hanich, Univ. Cadi Ayyad (Morocco); Lionel Jarlan, Ctr. d'Etudes Spatiales de la Biosphère (France) and Météorologie Nationale Marocaine (Morocco); Philippe Maisongrande, Ctr. National d'Études Spatiales (France); Gilles Boulet, Vincent Simonneaux, Abdelghani Chehbouni, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-79]

The climatic changes on agriculture and ecosystem environment influence estimate and counterplan for the northeast of China, Nanping Xu, Meteorological Bureau of Heilongjiang (China) . . . . [7824-81]

Satellite-derived techniques of estimating precipitation in case of flood over Cyprus, Argyro Nisantzi, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [7824-80]

Numerical simulation of the light field in the hydrologic system using in-situ inherent optical properties and matrix-operator method, Bangyi Tao, The Second Institute of Oceanography, SOA (China) and Shanghai Institute of Technical Physics (China); Zhihua Mao, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [7824-82]

Integrated GIS/AHP-based flood disaster risk assessment and zonation: a case study of Henan Province, China, Junling Li, Huailiang Chen, Zhongyang Liu, Chunhui Zou, Henan Institute of Meteorological Science (China) . . . . . [7824-83]

Spectrum variation of typical mixed-pixel of MODIS imagery in agricultural area in north China plain, Zhen Wang, Suying Chen, Yuping Lei, Institute of Genetics and Developmental Biology (China) . . . [7824-84]

Surface soil humidity retrieval using remote sensing techniques: a triangle method validation, Antonino Maltese, Fulvio Capodici, Carmelo Cammalleri, Goffredo La Loggia, Univ. degli Studi di Palermo (Italy) . . . . . [7824-85]

Lidar and Radar Applications in Hydrology

A field experiment over wheat with ground-based microwave radiometer, Shengli Wu, China Meteorological Administration (China) . . . . . [7824-23]

Surface soil humidity retrieval by means of a semi-empirical coupled SAR model, Fulvio Capodici, Antonino Maltese, Giuseppe Ciraolo, Univ. degli Studi di Palermo (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Goffredo La Loggia, Univ. degli Studi di Palermo (Italy) . . . . . [7824-86]

Vegetation and Crop Monitoring

Wednesday 22 September

SESSION 9

Room: Daurat . . . . . Wed. 08.50 to 10.10

Vegetation and Crop Monitoring

Session Chair: **Katja Richter,**
Ludwig-Maximilians-Univ. München (Germany)

Coffee Break . . . . . 10.10 to 10.30

SESSION 10

Room: Daurat . . . . . Wed. 10.30 to 11.30

Estuarine and Coastal Applications

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

Lunch/Exhibition Break . . . . . 11.30 to 13.20

SESSION 11

Room: Daurat . . . . . .Wed. 13.20 to 15.20

Hydrological and Ecosystem Modelling I

Session Chair: **Goffredo La Loggia,** Univ. degli Studi di Palermo (Italy)

13.20: **Leaf area index and fraction of photosynthetically active radiation fluctuations in New York Harriman Park**, Todd M. Holden, Sunil Dehipawala, Eric Cheung, Tayyaba Nasar, Paul J. Marchese, George Tremberger, Jr., Tak D. Cheung, Queensborough Community College (United States). . . . . [7824-49]

13.40: **Integrated modeling of the water cycle in semi arid watersheds based on ground and satellite data: the SudMed project**, Abdelghani Chehbouni, Ctr. d'Etudes Spatiales de la Biosphère (France); Brahim Berjami, Agence du Bassin Hydraulique du Tensift (Morocco); Gilles Boulet, Ctr. d'Etudes Spatiales de la Biosphère (France); Ahmed Chehbouni, Univ. Cadi Ayyad (Morocco); Laurent Drapeau, Benoit Duchemin, Ctr. d'Etudes Spatiales de la Biosphère (France); Noura Guemouria, Lahoucine Hanich, Cadi Ayyad Univ. (Morocco); Lionel Jarlan, Ctr. d'Etudes Spatiales de la Biosphère (France) and Direction de la Météorologie Nationale Marocaine (Morocco); Hakim Kharrou, Office Régional de Mise en Valeur Agricole du Haouz (Morocco); Said Khabba, Cadi Ayyad Univ. (Morocco); Michel Le Page, Ctr. d'Etudes Spatiales de la Biosphère (France) and Cadi Ayyad Univ. (Morocco); Sylvain Mangiarotti, Bernard Mougenot, Vincent Simonneaux, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-50]

14.00: **NARMA/GEOLAND2 contribution to Congo river basin hydrology understanding by means of Earth observation**, Mirco Boschetti, Pietro Alessandro Brivio, Consiglio Nazionale delle Ricerche (Italy); Etienne Bartholome, European Commission Joint Research Ctr. (Italy); Francesco Nutini, Stefano Bocchi, Univ. degli Studi di Milano (Italy) . . . . . [7824-51]

14.20: **Revising land cover and use classification of northern areas for climate modeling**, Markus Törmä, Pekka Härmä, SYKE Finnish Environment Institute (Finland); Tiina Markkanen, Finnish Meteorological Institute (Finland); Suvi Hatunen, SYKE Finnish Environment Institute (Finland); Ali Nadir Arslan, Finnish Meteorological Institute (Finland). . . . . [7824-52]

14.40: **Studying the Recreational Potential of Chitgar Forest Park in Iran using GIS and RS Techniques**, Jafar Oladi, Univ. of Mazandaran (Iran, Islamic Republic of); Dlavar Bozorgnia, Cultural Heritage Handicrafts and Tourism Org (Iran, Islamic Republic of); Masoumeh Rezvanfar, Univ. of Mazandaran (Iran, Islamic Republic of). . . . . [7824-103]

15.00: **Analysis of a meso-β Scale convective system during a brief torrential rain event in northeast China**, Meiying Yuan, China Meteorological Administration (China) . . . . . [7824-54]

Coffee Break . . . . . 15.20 to 15.50

SESSION 12

Room: Daurat . . . . . .Wed. 15.50 to 17.30

Hydrological and Ecosystem Modelling II

Session Chair: **Goffredo La Loggia,** Univ. degli Studi di Palermo (Italy)

15.50: **Thermal inertia model for soil water content retrieval using thermal and multispectral images**, Antonino Maltese, Carmelo Cammalleri, Giuseppe Ciraolo, Francesco D'Asaro, Mario Minacapilli, Univ. degli Studi di Palermo (Italy). . . . . [7824-55]

16.10: **Satellite-derived techniques of estimating precipitation in case of flood over Cyprus**, Argyro Nisantzi, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [7824-80]

16.30: **Remote sensing indicators to identify slightly and moderately salt-affected soils based on MODIS Terra and geochemical data**, Moncef Bouaziz, Joerg Matschullat, Richard Gloaguen, Technische Univ. Bergakademie Freiberg (Germany) . . . . . [7824-57]

16.50: **Snow evolution in Sierra Nevada (Spain) from an energy balance model corrected by Landsat TM data**, Javier Herrero, Miriam Carpintero, Vanessa Piña, Cristina Aguilar, Univ. de Granada (Spain) and Univ. de Córdoba (Spain); María J. Polo, Univ. de Córdoba (Spain) and Univ. de Granada (Spain) . . . . . [7824-58]

17.10: **A physical model for LAI retrieval: directional second derivative of canopy spectrum**, Binyan Yan, Wenjie Fan, Xiru Xu, Peking Univ. (China) . . . . . [7824-59]

Wednesday-Thursday 22-23 September 2010 • Proceedings of SPIE Vol. 7825

Remote Sensing of the Ocean, Sea Ice, and Large Water Regions 2010

Conference Chairs: **Charles R. Bostater, Jr.,** Florida Institute of Technology (USA); **Stelios P. Mertikas,** Technical Univ. of Crete (Greece); **Xavier Neyt,** Royal Belgian Military Academy (Belgium); **Miguel Velez-Reyes,** Univ. de Puerto Rico Mayagüez (USA)

Programme Committee: **Karine Caillault,** ONERA (France); **Eurico J. D'Sa,** Louisiana State Univ. (USA); **Alex Gilerson,** The City College of New York (USA); **Ana M. Martins,** Univ. dos Açores (Portugal)

Tuesday 21 September

Posters—Tuesday

Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Research on the merging of multi-source remotely sensed SST products, Peng Guo, Henan Institute of Meteorological Science (China) and Beijing Normal Univ. (China) and China Mining Association (China); Yanchen Bo, Beijing Normal Univ. (China) . . . . . [7825-24]

Radar and optic investigations of surface wave variability in Black Sea shelf zone, Victor V. Bakhanov, Nikolai A. Bogatov, Aleksei V. Ermoshkin, Emma M. Zuikova, Olga N. Kemarskaya, Victor I. Titov, Institute of Applied Physics (Russian Federation) . . . . . [7825-25]

In-orbit measurement simulation for geostationary ocean color instruments using coupled multi-layer ocean and atmospheric models, Dongok Ryu, Eun-Song Oh, Sehyun Seong, Ki-Beom Ahn, Kil-Jae Jung, Jinhee Yu, Soomin Jeong, Yonsei Univ. (Korea, Republic of); Yukyung Jeong, I&A Tech, Inc. (Korea, Republic of); Sug-Whan Kim, Yonsei Univ. (Korea, Republic of) . . . . . [7825-26]

The influence of wind roughness on the time characteristics of impulse airborne ocean lidars, Alexander G. Luchinin, Institute of Applied Physics (Russian Federation) . . . . . [7825-27]

Effects of suspended matter concentration on algae spectrum's characteristic positions in Hangzhou Bay, China, Qian Cheng, Xiuju Wu, Zhejiang Gongshang Univ. (China) . . . . . [7825-28]

Wednesday 22 September

Opening Remarks

Room: Diamant . . . . . Wed. 08.45 to 08.50

Charles R. Bostater, Jr., Florida Institute of Technology (USA)

SESSION 1

Room: Diamant . . . . . Wed. 08.50 to 11.20

Water Column Properties & SST Imaging and Algorithms

Session Chair: **Eurico J. D'Sa,** Univ. de Puerto Rico Maygüez (USA)

08.50: **Effects of a frontal passage on surface salinity distribution along the Louisiana-Texas coast from ocean color and model outputs** *(Invited Paper)*, Eurico J. D'Sa, Louisiana State Univ. (United States); Dong S. Ko, U.S. Naval Research Lab. (United States) . . . . . [7825-01]

09.20: **Empirical orthogonal function (EOF) analysis of sea-surface temperature and chlorophyll in the eastern Bering Sea**, Puneeta Naik, Eurico D'Sa, Louisiana State Univ. (United States) . . . . . [7825-02]

09.40: **Validation of ocean color satellite sensors using coastal observational platform in Long Island Sound**, Soe M. Hlaing, Amir Ibrahim, Ioannis Ioannou, Alberto Tonizzo, Alex Gilerson, Samir Ahmed, The City College of New York (United States) . . . . . [7825-03]

Coffee Break . . . . . 10.00 to 10.30

10.30: **Assessment of Spatiotemporal Nutrient Pollution Impacts in the Tampa Bay Estuary System Using MODIS Images** *(Invited Paper)*, Ni-Bin Chang, Univ. of Central Florida (United States); Ammarin Daranpob, University of Central Florida (United States); Jeffrey Yang, USEPA National Risk Management Research Laboratory (United States) . . . . . [7825-05]

11.00: **Detection of surface algal blooms using the newly developed algorithm surface algal bloom index (SABI)**, Fahad A. Alawadi, Univ. of Southampton (United Kingdom) . . . . . [7825-06]

SESSION 2

Room: Diamant . . . . . Wed. 11.20 to 12.00

SAR, Microwave & Altimetry: RS of Water I

Session Chair: **Stelios P. Mertikas,** Technical Univ. of Crete (Greece)

11.20: **SRAL, a radar altimeter designed to measure several surface types**, Yves Le Roy, Marc Deschaux-Beaume, Thales Alenia Space (France); Constantin E. Mavrocordatos, Franck Borde, European Space Agency (Netherlands) . . . . . [7825-07]

11.40: **Microwave satellite data to quantify effects of global climate change on arctic rivers**, Zsófia Kugler, Budapest Univ. of Technology and Economics (Hungary) . . . . . [7825-08]

Lunch/Exhibition Break . . . . . 12.00 to 13.20

SESSION 3
Room: Diamant . . . . . .Wed. 13.20 to 15.10

SAR, Microwave & Altimetry: RS of Water II

Session Chair: **Stelios P. Mertikas,** Technical Univ. of Crete (Greece)

13.20: **Oil spill classification based on multi-spectral remotely sensed images using an ensemble of SVMs** *(Invited Paper)*, Linda Corucci, Univ. di Pisa (Italy); Fabio Nardelli, Flyby S.r.l. (Italy); Marco Cococcioni, Univ. di Pisa (Italy) . . . . . [7825-09]

13.50: **Optimization of RADARSAT-2 SAR imagery for vessel detection applications**, Keith D. R. Beckett D.V.M., Alan A. Thompson, Anthony P. Luscombe, George Stirling, MacDonald, Dettwiler & Associates Ltd. (Canada) . . . . . [7825-10]

14.10: **Radar altimetry mission on Iridium NEXT LEO constellation**, Om P. Gupta, Iridium Satellite LLC (United States) . . . . . [7825-11]

14.30: **Absolute calibration of Jason satellite radar altimeters at Gavdos Cal/Val facility using independent techniques**, Stelios P. Mertikas, Antonis Daskalakis, Vasileios Tserolas, Technical Univ. of Crete (Greece); Walter Hausleitner, Space Research Institute (Austria); Ilias N. Tziavos, Aristotle Univ. of Thessaloniki (Greece); Vassilis Zervakis, Univ. of the Aegean (Greece); Xenophon Frantzis, Achilles Tripolitsiotis, Technical Univ. of Crete (Greece); George S. Vergos, Aristotle Univ. of Thessaloniki (Greece); Panagiotis Partsinevelos, Demitris Andrikopoulos, Technical Univ. of Crete (Greece) . . . . . [7825-12]

14.50: **Simulation and evaluation for measuring directional ocean wave spectrum from SWIM on CFOSAT**, Ren Lin, Pan Delu, Mao Zhihua, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [7825-13]

Coffee Break . . . . . 15.10 to 15.40

SESSION 4
Room: Diamant . . . . . .Wed. 15.40 to 17.30

Water Surface and Subsurface Sensing

Session Chair: **Xavier Neyt,** Royal Belgian Military Academy (Belgium)

15.40: **Experimentally based simulations on modulated lidar for shallow underwater target detection and localization** *(Invited Paper)*, Vincent Jezequel, Univ. de Bretagne Occidentale (France) and Univ. Européen de Bretagne (France); Frédéric Audo, Ecole Nationale d'Ingenieurs de Brest (France); Fabrice Pellen, Bernard Le Jeune, Univ. de Bretagne Occidentale (France) and Univ. Européen de Bretagne (France) . . . . . [7825-14]

16.10: **Sensitivity of the above water polarized reflectance to the water composition**, Alberto Tonizzo, Amir Ibrahim, Jing Zhou, Soe Min Hlaing, Ioannis Ioannou, Alex Gilerson, Barry Gross, Fred Moshary, Samir Ahmed, The City College of New York (United States) . . . . . [7825-15]

16.30: **Investigation of surface roughness with optical methods**, Viktor I. Titov, Institute of Applied Physics (Russian Federation) . . . . . [7825-16]

16.50: **Image analysis for water surface & subsurface features in shallow waters**, Charles R. Bostater, Jr., Florida Institute of Technology (United States) . . . . . [7825-17]

17.10: **Airborne validation of a new-style ultraviolet push-broom camera for ocean oil spills pollution surveillance**, Da-yi Yin, Xiaoxian Huang, Wei-Feng Qian, Y. X. Huang, Yu-Min Li, Qi Feng, Shanghai Institute of Technical Physics (China) . . . . . [7825-29]

Thursday 23 September

SESSION 5
Room: Diamant . . . . . .Thurs. 09.00 to 12.10

Joint Session: Airborne Remote Sensing: Programs and Data Sets

Session Chair: **Klaus Schäfer,**
Karlsruher Institut für Technologie (Germany)

Joint Session with Conference 7826:
Sensors, Systems, and Next-Generation Satellites

09.00: **NASA's Airborne Science Program** *(Invited Paper)*, Randall T. Albertson, NASA Dryden Flight Research Ctr. (United States); Bruce A. Tagg, NASA Headquarters (United States); Susan M. Schoenung, NASA Ames Research Ctr. (United States) . . . . . [7826-83]

09.30: **EUFAR, the European Facility for Airborne Research, becomes 10**, Ils Reusen, VITO NV (Belgium); Jean-Louis Brenguier, Meteo-France CNRM (France) . . . . . [7826-95]

09.50: **Using hyperspectral remote sensing for identification and mapping the forest fire promoter: rhododendron**, Guoxiang Liu, Jeffery S. Allen, Clemson Univ. (United States); Kang Lu, Towson Univ. (United States); Lucy Brudnak, USDA Forest Service (United States) . . . [7825-19]

Coffee Break . . . . . 10.10 to 10.40

10.40: **Airborne surveillance of water basins with hyperspectral FLS-Lidar** *(Invited Paper)*, Sergey M. Babichenko, Valeri Alekseyev, Aleksei Lisin, Jüri Lapimaa, Larisa Poryvkina, Sergei Shchemelyov, Innokenti Sobolev, Daniel Gastón, Laser Diagnostic Instruments AS (Estonia) . . . . . [7825-20]

11.10: **Bathymetric and topographic airborne LiDAR for mapping the flood risk from sea-level rise and extreme wave events in the Basque coast**, Guillem Chust, Pedro Liria, Ainhoa Caballero, AZTI-Tecnalia (Spain); Marta Marcos, El Instituto Mediterráneo de Estudios Avanzados (Spain); Ángel Borja, AZTI-Tecnalia (Spain) . . . . . [7825-21]

11.30: **An oil slick information retrieval method overcoming the influence of sun glitter, based on AISA+ airborne hyper-spectral image**, Yuanzeng Zhan, Tianming Mao, Fang Gong, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . [7825-22]

11.50: **Integration, testing and calibration of airborne imagers for land & water applications**, Charles R. Bostater, Jr., Florida Institute of Technology (United States) . . . . . [7825-23]

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Sensors, Systems, and Next-Generation Satellites

Conference Chairs: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands); **Steven P. Neeck,** NASA Headquarters (USA); **Haruhisa Shimoda,** Japan Aerospace Exploration Agency (Japan)

Programme Committee: **Shahid Habib,** NASA Goddard Space Flight Ctr. (USA); **Yann H. Kerr,** Ctr. d'Etudes Spatiales de la Biosphère (France); **Olivier Saint-Pe,** EADS Astrium (France); **Philippe M. Teillet,** Univ. of Lethbridge (Canada); **Xiaoxiong Xiong,** NASA Goddard Space Flight Ctr. (USA)

Monday 20 September

Welcome and Introduction
Room: Ariane 1 . . . . . Mon. 08.50 to 09.00

Roland Meynart, European Space Research and Technology Ctr. (Netherlands); **Steven P. Neeck,** NASA Headquarters (USA); **Haruhisa Shimoda,** Japan Aerospace Exploration Agency (Japan)

SESSION 1
Room: Ariane 1 . . . . . Mon. 09.00 to 10.30

Japanese Missions I
Session Chair: **Haruhisa Shimoda,**
Japan Aerospace Exploration Agency (Japan)

09.00: **Overview of Japanese Earth observation programs** *(Invited Paper)*, Haruhisa Shimoda, Japan Aerospace Exploration Agency (Japan). . . . . [7826-01]

09.30: **Disaster monitoring for the Abruzzo earthquake in Italy with ALOS/PALSAR observations**, Noriyuki Kawano, Japan Aerospace Exploration Agency (Japan). . . . . [7826-02]

09.50: **On orbit status of TANSO on GOSAT**, Hiroshi Suto, Akihiko Kuze, Kei Shiomi, Masakatsu Nakajima, Japan Aerospace Exploration Agency (Japan). . . . . [7826-03]

10.10: **Calibration of operational GOSAT Level 1 products**, Kei Shiomi, Tomoko Kina, Shuji Kawakami, Toshiaki Takeshima, Japan Aerospace Exploration Agency (Japan). . . . . [7826-04]

Coffee Break . . . . . 10.30 to 11.00

SESSION 2
Room: Ariane 1 . . . . . Mon. 11.00 to 12.20

Japanese Missions II
Session Chair: **Haruhisa Shimoda,**
Japan Aerospace Exploration Agency (Japan)

11.00: **GOSAT higher level Product status 1.5 year after the launch**, Hiroshi Watanabe, Hironari Ishihara, Nobuyuki Kikuchi, Kenji Hayashi, Fumie Kawazoe, Fumiho Takahashi, Tatsuya Yokota, National Institute for Environmental Studies (Japan) . . . . . [7826-05]

11.20: **Status of GCOM-W1 development and expected meteorological applications**, Daisaku Uesawa, Keiji Imaoka, Misako Kachi, Hideyuki Fujii, Japan Aerospace Exploration Agency (Japan); Masahiro Kazumori, Japan Meteorological Agency (Japan); Marehito Kasahara, Norimasa Ito, Keizo Nakagawa, Japan Aerospace Exploration Agency (Japan); Taikan Oki, The Univ. of Tokyo (Japan). . . . . [7826-06]

11.40: **Engineering Model activity of the Second-generation Global Imager(SGLI)**, Haruhisa Shimoda, Kazuhiro Tanaka, Japan Aerospace Exploration Agency (Japan). . . . . [7826-07]

12.00: **Development status of Japanese spaceborne cloud profiling radar for EarthCARE mission**, Kazuyuki Okada, Toshiyoshi Kimura, Hirotaka Nakatsuka, Kenji Sato, Yoshihiro Seki, Yasuo Sakaide, Japan Aerospace Exploration Agency (Japan); Hiroshi Kumagai, Nobuhiro Takahashi, Yuichi Ohno, Hiroaki Horie, National Institute of Information and Communications Technology (Japan) . . . . . [7826-08]

Lunch Break . . . . . 12.20 to 13.50

SESSION 3
Room: Ariane 1 . . . . . Mon. 13.50 to 15.10

Japanese Missions III
Session Chair: **Haruhisa Shimoda,**
Japan Aerospace Exploration Agency (Japan)

13.50: **Status of development of the GPM Dual-frequency Precipitation Radar (DPR), algorithm development, and ground validation activities**, Misako Kachi, Riko Oki, Shuji Shimizu, Takuji Kubota, Naofumi Yoshida, Yasutoshi Hyakusoku, Takeshi Miura, Kinji Furukawa, Masahiro Kojima, Japan Aerospace Exploration Agency (Japan); Toshio Iguchi, National Institute of Information and Communications Technology (Japan) and Japan Aerospace Exploration Agency (Japan); Kenji Nakamura, Nagoya Univ. (Japan) and Japan Aerospace Exploration Agency (Japan) . . . . . [7826-09]

14.10: **Development status of Japanese Advanced Land Observing Satellite-2**, Yoshihisa Arikawa, Yuji Osawa, Yasushi Hatooka, Shinichi Suzuki, Yukihiro Kankaku, Japan Aerospace Exploration Agency (Japan). . . . . [7826-10]

14.30: **Current status of ALOS-3 (Advanced Land Observing Satellite-3)**, Tadashi Imai, Haruyoshi Katayama, Hiroko Imai, Yasushi Hatooka, Shinichi Suzuki, Yuji Osawa, Japan Aerospace Exploration Agency (Japan) . . . . . [7826-11]

14.50: **Recent results from the Superconducting submillimeter wave limb emission sounder (SMILES) onboard ISS/JEM**, Masato Shiotani, Kyoto Univ. (Japan); Masahiro Takayanagi, Makoto Suzuki, Takuki Sano, Japan Aerospace Exploration Agency (Japan) . . . . . [7826-12]

Coffee Break . . . . . 15.10 to 15.40

PLEASE NOTE:
Session 4, European Missions and Joint Session: SMOS, run concurrently

SESSION 4

Room: Ariane 1 . . . . . Mon. 15.40 to 17.10

European Missions I

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

15.40: **Status of ESA Earth observations missions** *(Invited Paper)*, Roland Meynart, European Space Research and Technology Ctr. (Netherlands) . . . . . [7826-13]

16.10: **The GOCE gravity gradiometer**, Daniel Lamarre, European Space Research and Technology Ctr. (Netherlands); Max Bard, Thales Alenia Space (France); Jean-Pierre Marque, ONERA (France); Stefano Cesare, Thales Alenia Space (Italy). . . . . [7826-14]

16.30: **Aspects of the Earthcare Satellite and its payload**, Robert V. Gelsthorpe, Arnaud Heliere, Jerzy Lemanczyk, Abelardo Perez-Albinana, Kotska Wallace, Alain Lefebvre, European Space Agency (Netherlands) . . . . . [7826-15]

16.50: **The EarthCARE multispectral imager thermal infrared optical unit detection system design**, Mark Chang, Luis E. Gomez-Rojas, Matthew G. Maher, Guy C. Baister, Trevor Wood, David M. Woods, Gordon R. Hopkinson, Mark Skipper, Matthew Price, Surrey Satellite Technology Ltd. (United Kingdom) . . . . . [7826-16]

SESSION JS1

Room: Daurat. . . . . Mon. 14.40 to 17.30

Joint Session: SMOS

Session Chairs: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy); **Yann H. Kerr,** Ctr. d'Etudes Spatiales de la Biosphère (France)

Joint Session with Conference 7824, Remote Sensing for Agriculture, Ecosystems, and Hydrology

14.40: **SMOS: from concept to operations and from operation to the next generation** *(Invited Paper)*, Yann H. Kerr, Ctr. National d'Études Spatiales (France); Philippe Waldteufel, Lab. des Sciences du Climat et de l'Environnement (France); Francois Cabot, Bernard Rougé, Ctr. d'Etudes Spatiales de la Biosphère (France); Eric Anterrieu, Univ. de Toulouse (France); Philippe Richaume, Ctr. d'Etudes Spatiales de la Biosphère (France); Achim R. Hahne, Susanne Mecklenburg, European Space Research and Technology Ctr. (Netherlands) . . . . . [7826-82]

15.10: **SMOS's first in flight results**, Yann H. Kerr, Ctr. National d'Études Spatiales (France); Philippe Waldteufel, Lab. des Sciences du Climat et de l'Environnement (France); Philippe Richaume, François Cabot, Ctr. National d'Études Spatiales (France); Jordi Font, Institut de Ciències del Mar (Spain); Steven Delwart, Achim R. Hahne, European Space Research and Technology Ctr. (Netherlands); Susanne Mecklenburg, European Space Research and Technology Ctr. (Italy). . . . . [7824-14]

Coffee Break . . . . . 15.10 to 15.30

15.50: **Global soil moisture maps using SMOS**, Yann H. Kerr, Philippe Richaume, François Cabot, Ctr. National d'Études Spatiales (France); Philippe Waldteufel, Lab. des Sciences du Climat et de l'Environnement (France); Jean Pierre Wigneron, Institut National de la Recherche Agronomique (France); Ali Mahmoodi, Array Systems Computing, Inc. (Canada) . . . . . [7824-15]

16.10: **SMOS soil moisture values evaluation over Sahelian area**, Claire Gruhier, Ctr. d'Etudes Spatiales de la Biosphère (France); Thierry Pellarin, Univ. de Grenoble (France); Yann H. Kerr, Ctr. d'Etudes Spatiales de la Biosphère (France); Manuela Grippa, Univ. Paul Sabatier (France) . . . . . [7824-16]

16.30: **Disaggregation as a top-down approach for evaluating 40 km resolution SMOS data using point-scale measurements: application to AACES'10**, Olivier Merlin, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-17]

16.50: **Event detection of hydrological processes with passive L-band data from SMOS**, Ahmad AlBitar, Elsa Jacquette, Yann H. Kerr, Arnaud Mialon, François Cabot, Ctr. d'Etudes Spatiales de la Biosphère (France); Arnaud Quesney, Capgemini Sud (France); Philippe Richaume, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-18]

17.10: **SMOS CATDS level 3 global products over land,** Jacquette Elsa, Ahmad AlBitar, Arnaud Mialon, Yann H. Kerr, Ctr. d'Etudes Spatiales de la Biosphère (France); Quesney Arnaud, Capgemini Sud (France); François Cabot, Philippe Richaume, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7824-19]

Remote Sensing Plenary Session

Monday 20 September, 17.35 to 19.05

For details see page 7

Tuesday 21 September

SESSION 5
Room: Ariane 1 . . . . . Tues. 08.45 to 10.25

European Missions II

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

08.45: **Design and development of the Sentinel-2 Multi Spectral Instrument and satellite system**, Vincent Chorvalli, Vincent H. Cazaubiel, EADS Astrium (France); Stefan Bursch, Mario Welsch, Heinz Sontag, EADS Astrium GmbH (Germany); Philippe Martimort, Umberto Del Bello, Omar Sy, Paolo Laberinti, François Spoto, European Space Research and Technology Ctr. (Netherlands). . . . . [7826-17]

09.05: **Sentinel 3: overview on optical payload and L1/L2 processor development**, Jens Nieke, Johannes Frerick, Constantin E. Mavrocordatos, Bruno Berruti, Helge Rebhan, European Space Research and Technology Ctr. (Netherlands) . . . . . [7826-18]

09.25: **Status of the Sea & Land Surface Temperature Radiometer (SLSTR) for the Sentinel 3 GMES Mission**, Peter Coppo, Massimo Cosi, Selex-Galileo (Italy); Jens Nieke, European Space Research and Technology Ctr. (Netherlands); Dave Smith, RAL (United Kingdom); Wolfgang Engel, JENOPTIK (Germany). . . . . [7826-19]

09.45: **Design and development of the Sentinel-3 Microwave Radiometer payload**, Marc Bergadà, Patricia Brotons, Yolanda Camacho, Leila Díez, Ataúlfo Gamonal, José Luis García, Raquel González, Alberto Pacheco, Miguel Á. Palacios, EADS CASA Espacio (Spain); Ulf Klein, European Space Research and Technology Ctr. (Netherlands) . . . . . [7826-20]

10.05: **Status of the Ocean and Land Colour imager (OLCI) for the Sentinel 3 GMES Mission**, Yves Delclaud, Thierry Garnier, Jean-Bernard Riti, Thales Alenia Space (France); Jens Nieke, Juergen Stroede, European Space Research and Technology Ctr. (Netherlands) . . . . . [7826-96]

Coffee Break . . . . . 10.25 to 10.50

SESSION 6
Room: Ariane 1 . . . . . Tues. 10.50 to 12.10

European Missions III

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

10.50: **Feasibility studies for the follow-on EUMETSAT polar system**, Stefano Banfi, Peter Schluessel, Dorothee Diebel, Paul Clarke, European Organisation for the Exploitation of Meteorological Satellites (Germany); Maurizio Betto, Chung-Chi Lin, Ville Kangas, Stefan Kraft, Paolo Bensi, ESA-ESTEC (Netherlands); Isabel Zerfowski, DLR (Germany); Muriel Saccoccio, Thierry Maciaszek, CNES (France). . . . . [7826-21]

11.10: **METimage: a multispectral imaging radiometer for the EUMETSAT Polar System follow-on satellite mission**, Frank Schmülling, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Alexander Pillukat, Jena-Optronik GmbH (Germany); Isabel Zerfowski, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . [7826-22]

11.30: **Megha-Tropiques satellite mission: sensors performances**, Nadia Karouche, Ctr. National d'Études Spatiales (France); Garuda Raju, ISRO Satellite Ctr. (India). . . . . [7826-23]

11.50: **PROBA-V, a vegetation satellite**, Guillaume Huby, GEOSYS SA (France); Richard P. Kleihorst, Flemish Institute for Technological Research (Belgium); Karim Mellab, European Space Research and Technology Ctr. (Netherlands). . . . . [7826-24]

Lunch/Exhibition Break . . . . . 12.10 to 13.30

SESSION 7
Room: Ariane 1 . . . . . Tues. 13.30 to 15.20

US Missions I

Session Chair: **Steven P. Neeck,** NASA Headquarters (USA)

13.30: **NASA Earth Science Flight Program status** *(Invited Paper)*, Steven P. Neeck, Stephen M. Volz, NASA Headquarters (United States) . . . . . [7826-25]

14.00: **Accurate monitoring of terrestrial aerosols and total solar irradiance: the NASA Glory mission**, Brian Cairns, NASA Goddard Institute for Space Studies (United States); Gregg A. Kopp, Univ. of Colorado at Boulder (United States); Bryan A. Fafaul, Steve E. Pszcolka, NASA Goddard Space Flight Ctr. (United States); Michael I. Mishchenko, NASA Goddard Institute for Space Studies (United States); Hal Maring, NASA Headquarters (United States) . . . . . [7826-26]

14.20: **Aquarius/SAC-D: an international remote sensing satellite mission measuring sea surface salinity**, Amit Sen, David Durham, Jet Propulsion Lab. (United States); Daniel Caruso, Carlos Falcon, Comision Nacional de Actividades Espaciales (Argentina) . . . . . [7826-27]

14.40: **The Orbiting Carbon Observatory Instrument: Performance of the OCO Instrument and plans for the OCO-2 Instrument**, Randy Pollock, Jet Propulsion Lab. (United States); Robert E. Haring, Hamilton Sundstrand - Energy, Space & Defense - Pomona (United States); James R. Holden, Dean L. Johnson, Andrea Kapitanoff, Jet Propulsion Lab. (United States); David Mohlman, Hamilton Sundstrand - Energy, Space & Defense - Pomona (United States); Jeffrey M. Oseas, Charles Phillips, David Randall, Jet Propulsion Lab. (United States); David Rechsteiner, Hamilton Sundstrand - Energy, Space & Defense - Pomona (United States); Jose Rivera, Jose I. Rodriguez, Mark A. Schwochert, Jet Propulsion Lab. (United States); Brian M. Sutin, Hamilton Sundstrand - Energy, Space & Defense - Pomona (United States) . . . . . [7826-28]

15.00: **Global precipitation measurement (GPM) implementation**, Steven P. Neeck, Ramesh K. Kakar, NASA Headquarters (United States); Arthur Y. Hou, Art A. Azarbarzin, NASA Goddard Space Flight Center (United States). . . . . [7826-29]

Coffee Break . . . . . 15.20 to 15.50

SESSION 8
Room: Ariane 1 . . . . . Tues. 15.50 to 17.30

US Missions II

Session Chair: **Steven P. Neeck,** NASA Headquarters (USA)

15.50: **The Jason-3 Mission: completing the transition of ocean altimetry from research to operations**, Parag Vaze, Jet Propulsion Laboratory (United States); Steven Neeck, National Aeronautics and Space Administration (United States); Walid Bannoura, Joseph Green, Angelo Wade, Michael Mignogno, National Oceanic and Atmospheric Administration (United States); Gerard Zaouche, Veronique Couderc, Centre National D'Etudes Spatiales (France); Eric Thouvenot, Centre National D'Etudes Spatiales (CNES) (France); Francois Parisot, European Organisation for the Explortation of Mereorological Satellites (EUMETSAT) (Germany) . . . . . [7826-30]

16.10: **NASA's soil moisture active and passive (SMAP) mission**, Kent Kellogg, Eni G. Njoku, S. T. Thurman, Wendy N. Edelstein, Michael W. Spencer, Gun-Shing Chen, Jet Propulsion Lab. (United States); Dara Entekhabi, Massachusetts Institute of Technology (United States); Peggy E. O'Neill, Jeffrey Piepmeier, NASA Goddard Space Flight Ctr. (United States); Molly E. Brown, Science Systems and Applications, Inc. (United States); Neil F. Martin, NASA Goddard Space Flight Ctr. (United States); Jared K. Entin, NASA Headquarters (United States). . . . . [7826-31]

16.30: **Ice, clouds and land elevation (ICESat-2) mission**, Douglas D. McLennan, NASA Goddard Space Flight Ctr. (United States) . . . [7826-32]

16.50: **CLARREO cornerstone of the Earth Observing System: measuring decadal change through accurate emitted infrared and reflected solar spectra and radio occultation**, Stephen P. Sandford, NASA Langley Research Ctr. (United States) . . . . . [7826-33]

17.10: **Hyperspectral infrared imager (HyspIRI): NASA's decadal survey land imager,** Michael J. Abrams, Simon Hook, Jet Propulsion Lab. (United States). . . . . [7826-34]

Posters—Tuesday
Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Research of stabilization technology for tethered aerostat electro-optical imaging platform, Weihu Zhou, The Academy of Opto-Electronics (Dominica); Yawei Wang, BeiHang Univ. (Egypt); Xiaoquan Han, Qian Wang, The Academy of Opto-Electronics (China). . . . . [7826-84]

Design of FPGA-based EMCCD imaging spectral equipment's electronic system, Zhipeng Xu, Qianting Zhou, Jun Wei, Shanghai Institute of Technical Physics (China) . . . . . [7826-85]

Radiometric calibration of multi-spectral scanner of ZY-1 satellite, Linhua Yang, Shanping Jiang, Beijing Institute of Satellite Environment Engineering (China) . . . . . [7826-86]

Remote sensing cubesat, Ayman Mahmoud, National Authority for Remote Sensing and Space Sciences (Egypt); Tamer T. Elazhary, Ain Shams Univ. (Egypt); Amal Zaki, National Authority for Remote Sensing and Space Sciences (Egypt) . . . . . [7826-88]

Sub-pixel registration method for phase diversity wavefront sensor using spatial light modulator, Norihide Miyamura, The Univ. of Tokyo (Japan). . . . . [7826-89]

New technique for spacecraft navigation, George Dekoulis, Lancaster Univ. (United Kingdom) . . . . . [7826-90]

Metric for pseudo-invariant calibration test sites, Gyanesh Chander, U.S. Geological Survey (United States); Xiaoxiong (Jack) Xiong, NASA Goddard Space Flight Ctr . (United States); Dennis L. Helder, South Dakota State Univ. (United States); Amit Angal, Science Systems and Applications, Inc. (United States); Taeyoung (Jason) Choi, Aisheng Wu, Sigma Space Corp. (United States) . . . . . [7826-91]

Protecting the source of drink water in Lianyungang of China using remote sensing, Hongchun Peng, Haiying Li, Meiping Sun, Huaihai Institute of Technology (China) . . . . . [7826-92]

Study on urban heat island of Lian Yungang based on remote sensing, Haiying Li, Hongchun Peng, Meiping Sun, Huaihai Institute of Technology (China) . . . . . [7826-93]

Technology of land use remote sensing monitoring and control at regional scale, chunyan lu, Beijing Univ. of Posts and Telecommunications (China). . . . . [7826-94]

Image simulator for spatially imaging Fourier Transform spectrometer 'HJ1A-HSI', Bing Zhang, Wenjuan Zhang, Lianru Gao, Ctr. for Earth Observation and Digital Earth (China); Wei Zhang, Hefei Univ. of Technology (China) . . . . . [7826-97]

Wednesday 22 September

SESSION 9
Room: Ariane 1 . . . . . Wed. 08.30 to 10.10

SWOT Mission

Session Chair: **Steven P. Neeck,** NASA Headquarters (USA)

08.30: **The Surface Water and Ocean Topography Mission (SWOT): a mission concept to study the world's oceans and fresh water**, Parag Vaze, Jet Propulsion Lab. (United States); Vincent Albuys, Vincent Albuys (France); Daniel Esteban-Fernandez, Lee-Lueng Fu, Ernesto Rodriguez, Jet Propulsion Lab. (United States); Thierry Lafon, Juliette Lambin, Alain Mallet, Centre National D'Etudes Spatiales (CNES) (United States) . . . . . [7826-35]

08.50: **The Surface Water and Ocean Topography Mission (SWOT): the Ka-band Radar Interferometer (KaRIn) for water level measurements at all scales**, Ernesto Rodriguez, Parag Vaze, Daniel Esteban-Fernandez, Jet Propulsion Laboratory (United States). . [7826-36]

09.10: **The Surface Water and Ocean Topography Mission (SWOT): KaRIn error budget for centimetric spaceborne radar interferometry**, Daniel Esteban-Fernandez, Jet Propulsion Laboratory (United States); Parag Vaze, Jet Propulsion Lab. (United States); Ernesto Rodriguez, Lee-Lueng Fu, Jet Propulsion Laboratory (United States); Douglas Alsdorf, Ohio State University, Columbus, Ohio (United States) . . . . . [7826-37]

09.30: **KaRIn on SWOT: modeling and simulation of near-nadir Ka-band interferometric SAR images**, Roger Fjørtoft, Alain Mallet, Jean-Marc Gaudin, Nadine Pourthie, Christine Lion, Ctr. National d'Études Spatiales (France); Fifamè N. Koudogbo, Javier Duro, Patrick Ordoqui, Altamira Information (Spain); Alain Arnaud, Altamira Information (France); Christian Ruiz, Capgemini Sud (France) . . . . . [7826-38]

09.50: **The Surface Water and Ocean Topography Mission (SWOT): results of a multi-month assimilation for discharge estimation of the Ohio River using high-resolution simulated SWOT data**, Delwyn Moller, Remote Sensing Solutions, Inc. (United States); Kostas Andreadis, Ohio State University, Columbus, Ohio (United States); Ernesto Rodriguez, Jet Propulsion Laboratory (United States) . . . . . [7826-39]

Coffee Break . . . . . 10.10 to 10.40

SESSION 10
Room: Ariane 1 . . . . . Wed. 10.40 to 12.00

Missions and Sensing I

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

10.40: **The Atmospheric Processes on Climate and its Changes (APOCC) Initiative**, Martin Bergeron, Canadian Space Agency (Canada) . . . . . [7826-40]

11.00: **The Stratosphere Troposphere Exchange Processes (STEP) mission concept: a candidate for the Atmospheric Processes Of Climate Change (APOCC) mission**, Doug A. Degenstein, Univ. of Saskatchewan (Canada) . . . . . [7826-41]

11.20: **Technological evolutions on the FTS instrument for follow-on missions to SCISAT Atmospheric Chemistry Experiment**, Jacques Giroux, Serge Y. Fortin, Guillaume Girard, Marc-André Soucy, ABB Inc. (Canada) . . . . . [7826-42]

11.40: **TBA** . . . . . [7826-43]

Lunch/Exhibition Break . . . . . 12.00 to 13.40

SESSION 11
Room: Ariane 1 . . . . . .Wed. 13.40 to 15.00

Missions and Sensing II

Session Chair: **Steven P. Neeck,** NASA Headquarters (USA)

13.40: **Architecting constellations of 'operational' earth monitoring satellites (Part II),** Douglas B. Helmuth, Lockheed Martin Corp. (United States) . . . . . .[7826-45]

14.00: **Development of immersed diffraction grating for the TROPOMI-SWIR spectrometer,** Aaldert van Amerongen, SRON Netherlands Institute for Space Research (Netherlands); Huib Visser, Robert Vink, TNO (Netherlands); Tonny Coppens, Ruud W. M. Hoogeveen, SRON Netherlands Institute for Space Research (Netherlands) . . .[7826-46]

14.20: **High-precision scanner control system,** Yoshiho Yanagita, Kazuhiko Aoki, NEC Corp. (Japan); Toshihiro Kurii, NEC TOSHIBA Space Systems, Ltd. (Japan) . . . . . .[7826-47]

14.40: **Correction of heavily distorted aerial three-line imagery by means of optical orientation measurement,** Jürgen Wohlfeil, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . .[7826-48]

Coffee Break . . . . . .15.00 to 15.30

SESSION 12
Room: Ariane 1 . . . . . .Wed. 15.30 to 17.30

FPA I

Session Chair: **Olivier Saint-Pe,** EADS Astrium (France)

15.30: **Shortwave detector for hyperspectral imaging in the frame of EnMAP,** Dominique Huebner, Andreas Bauer, Luis-Dieter Haas, Holger Bitterlich, Martin Bruder, Markus Haiml, Stefan Rutzinger, Karl C. Hofmann, Karl-Martin Mahlein, Hans-Peter Nothaft, Richard Wollrab, Johann Ziegler, AIM INFRAROT-MODULE GmbH (Germany) . . .[7826-49]

15.50: **Two-dimensional focal plane detector arrays for LWIR/VLWIR space and airborne sounding missions,** Stefan Hanna, Andreas Bauer, Holger Bitterlich, Martin Bruder, Luis-Dieter Haas, Markus Haiml, Karl C. Hofmann, Karl-Martin Mahlein, Hans-Peter Nothaft, Andreas Weber, Richard Wollrab, Johann Ziegler, AIM INFRAROT-MODULE GmbH (Germany) . . . . . .[7826-50]

16.10: **Sofradir detectors for hyperspectral applications from visible up to LWIR,** Bruno Fièque, Philippe Chorier, Patrick Maillart, Bertrand Terrier, SOFRADIR (France) . . . . . .[7826-51]

16.30: **LWIR and VLWIR detectors development at SOFRADIR for space applications,** Anne Delannoy, Philippe Chorier, Bertrand Terrier, SOFRADIR (France). . . . . .[7826-52]

16.50: **Enhanced broadband (11-15 µm) QWIP FPAs for space applications,** Alexandru Nedelcu, Alcatel-Thales III-V Lab. (France); Ybe Creten, IMEC (Belgium); Vincent Guériaux, Arnaud Berurier, Toufiq Bria, Nadia Brière de l'Isle, Alcatel-Thales III-V Lab. (France); Chris A. Van Hoof, IMEC (Belgium) . . . . . .[7826-53]

17.10: **Development of multi-spectral QWIPs for extrasolar planets imaging,** Alexandru Nedelcu, Alcatel-Thales III-V Lab. (France); Eric J. Pantin, Commissariat à l'Énergie Atomique-Saclay (France) . . . .[7826-54]

Thursday 23 September

PLEASE NOTE:
Sessions 13 and 14 run concurrently with the Joint Session on Airborne Remote Sensing: Programs and Data Sets

SESSION 13
Room: Ariane 1 . . . . . .Thurs. 08.40 to 10.00

FPA II

Session Chair: **Olivier Saint-Pe,** EADS Astrium (France)

08.40: **The design, manufacture and characterization of the SWIR channel detector for the Proba-V mission**, Jonas L. Bentell, Peet Verbeke, Xenics NV (Belgium); Koen Vanhollebeke, Univ. Gent (Belgium); Alexandre de Kerckhove, Thomas Bocquet, Xenics NV (Belgium); Alexander Short, European Space Research and Technology Ctr. (Netherlands); Jan P. Vermeiren, Xenics NV (Belgium) . . . . . .[7826-55]

09.00: **Design of CMOS sensor fill factor and active area shape for optimal MTF and SNR**, Cynthia Liu, Jer Lin, Michael Tseng, National Space Organization (Taiwan). . . . . .[7826-56]

09.20: **Analytical modeling of MTF and QE of CCD and CMOS image sensors**, Ibrahima Djité, Institut Supérieur de l'Aéronautique et de l'Espace (France). . . . . .[7826-57]

09.40: **CMOS detectors for space applications: from R&D to operational program with large volume foundry**, Philippe Martin-Gonthier, Institut Supérieur de l'Aéronautique et de l'Espace (France) . . . . . .[7826-58]

Coffee Break . . . . . .10.00 to 10.30

SESSION 14
Room: Ariane 1 . . . . . .Thurs. 10.30 to 12.10

FPA III

Session Chair: **Olivier Saint-Pe,** EADS Astrium (France)

10.30: **Hybrid avalanche photodiode ranging and photon-counting altimeter**, Benoit Dupont, Bart Dierickx, Caeleste (Belgium); Stephen J. Bellis, J. Carlton Jackson, SensL (Ireland); Arnaud Defernez, Caeleste (Belgium) . . . . . .[7826-59]

10.50: **Evaluation of 10MeV proton irradiation on 5.5 Mpixel scientific CMOS image sensor**, Paul Vu, Boyd A. Fowler, Brian G. Rodricks, Stephen W. Mims, Wang Li, Fairchild Imaging (United States). . .[7826-60]

11.10: **Radiation damage in CMOS image sensors: testing and hardening challenges brought by deep sub-micrometer CIS processes**, Vincent Goiffon, ISAE (France); Philippe Martin-Gonthier, Institut Supérieur de l'Aéronautique et de l'Espace (France) . . . .[7826-61]

11.30: **EarthCARE BBR detectors performance characterization**, Christian Proulx, Martin Allard, Tim Pope, Bruno Tremblay, Fraser Williamson, INO (Canada); John Delderfield, Dave Parker, RAL (United Kingdom) . . . . . .[7826-62]

11.50: **Evaluation of a COTS microbolometer in space environment tests**, Herve Geoffray, Ctr. National d'Études Spatiales (France). [7826-63]

SESSION JS2
Room: Diamant . . . . . .Thurs. 09.00 to 12.10

Joint Session: Airborne Remote Sensing: Programs and Data Sets

Session Chair: **Klaus Schäfer,**
Karlsruher Institut für Technologie (Germany)

Joint Session with Conference 7825: Remote Sensing of the Ocean, Sea Ice, and Large Water Regions 2010

09.00: **NASA's Airborne Science Program** *(Invited Paper)*, Randall T. Albertson, NASA Dryden Flight Research Ctr. (United States); Bruce A. Tagg, NASA Headquarters (United States); Susan M. Schoenung, NASA Ames Research Ctr. (United States) . . . . . .[7826-83]

09.30: **EUFAR, the European Facility for Airborne Research, becomes 10**, Ils Reusen, VITO NV (Belgium); Jean-Louis Brenguier, Meteo-France CNRM (France) . . . . . .[7826-95]

09.50: **Using hyperspectral remote sensing for identification and mapping the forest fire promoter: rhododendron**, Guoxiang Liu, Jeffery S. Allen, Clemson Univ. (United States); Kang Lu, Towson Univ. (United States); Lucy Brudnak, USDA Forest Service (United States) . . .[7825-19]

Coffee Break . . . . . .10.10 to 10.20

10.40: **Airborne surveillance of water basins with hyperspectral FLS-Lidar** *(Invited Paper)*, Sergey M. Babichenko, Valeri Alekseyev, Aleksei Lisin, Jüri Lapimaa, Larisa Poryvkina, Sergei Shchemelyov, Innokenti Sobolev, Daniel Gastón, Laser Diagnostic Instruments AS (Estonia). . . . . .[7825-20]

11.10: **Bathymetric and topographic airborne LiDAR for mapping the flood risk from sea-level rise and extreme wave events in the Basque coast**, Guillem Chust, Pedro Liria, Ainhoa Caballero, AZTI-Tecnalia (Spain); Marta Marcos, El Instituto Mediterráneo de Estudios Avanzados (Spain); Ángel Borja, AZTI-Tecnalia (Spain). . . . . .[7825-21]

11.30: **An oil slick information retrieval method overcoming the influence of sun glitter, based on AISA+ airborne hyper-spectral image**, Yuanzeng Zhan, Tianming Mao, Fang Gong, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . .[7825-22]

11.50: **Integration, testing and calibration of airborne imagers for land & water applications**, Charles R. Bostater, Jr., Florida Institute of Technology (United States); Mate Kovacs, Marine & Environmental Optics Lab. (United States). . . . . .[7825-23]

Lunch Break . . . . . .12.10 to 13.20

PLEASE NOTE:
Sessions 15 and 16 run concurrently with Session 17

SESSION 15
Room: Ariane 1 . . . . . .Thurs. 13.20 to 15.00

Calibration I

Session Chair: **Philippe M. Teillet,** Univ. of Lethbridge (Canada)

13.20: **Aqua MODIS 8-year on-orbit operation and calibration**, Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Amit Angal, Science Systems and Applications, Inc. (United States); William Barnes, Joint Ctr. for Earth Systems Technology (United States) [7826-64]

13.40: **Terra MODIS band 2 electronic crosstalk: cause, impact, and mitigation**, Junqiang Sun, Sigma Space Corp. (United States); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States); Nianzeng Che, Sigma Space Corp. (United States); Amit Angal, Science Systems and Applications, Inc. (United States) . . . . . [7826-65]

14.00: **Tracking long-term stability of the response versus angle for the MODIS thermal emissive bands with observations over clear ocean**, Aisheng Wu, I-Wen Chu, Sigma Space Corp. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States) . . . . . [7826-66]

14.20: **Time-dependent response versus scan angle and its uncertainty for MODIS reflective solar bands**, Junqiang Sun, Sigma Space Corp. (United States); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States); Hongda Chen, Sigma Space Corp. (United States); Amit Angal, Science Systems and Applications, Inc. (United States); Xu Geng, Aisheng Wu, Sigma Space Corp. (United States) . . . . . [7826-68]

14.40: **Using CEOS reference standard test sites to track the calibration stability of NOAA-19 AVHRR reflective solar channels**, Aisheng Wu, Sigma Space Corp. (United States); Amit Angal, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Changyong Cao, National Environmental Satellite, Data, and Information Service (United States) . . . . . [7826-69]

Coffee Break . . . . . 15.00 to 15.30

SESSION 16
Room: Ariane 1 . . . . . .Thurs. 15.30 to 16.50

Calibration II

Session Chair: **Xiaoxiong J. Xiong,**
NASA Goddard Space Flight Ctr. (USA)

15.30: **The CEOS Cal/Val Portal: a new instrument for the cal/val community**, Alessandro Burini, ESA ESRIN (Italy); Gyanesh Chander, U.S. Geological Survey (United States); Nigel Fox, National Physical Lab. (United Kingdom); Philippe Goryl, ESA ESRIN (Italy) . . . . . [7826-70]

15.50: **Multiple vicarious calibration using combined accuracy estimation**, Stefan Livens, Sindy Sterckx, Flemish Institute for Technological Research (Belgium) . . . . . [7826-71]

16.10: **Characterization of a double monochromator**, Leibo Ding, John W. Cooper, Sigma Space Corp. (United States); Matthew G. Kowalewski, Goddard Earth Sciences and Technology Ctr. (United States); Gilbert R. Smith, Sigma Space Corp. (United States); James J. Butler, NASA Goddard Space Flight Ctr. (United States) . . . . . [7826-72]

16.30: **Onboard spectral calibration for the Japanese hyperspectral sensor**, Kenji Tatsumi, Nagamitsu Ohgi, Hisashi Harada, Toneo Kawanishi, Japan Resources Observation System and Space Utilization Organization (Japan); Fumihiro Sakuma, Japan Resources Observation System and Space Utilization Organization (Japan) and NEC TOSHIBA Space Systems, Ltd. (Japan); Yoshito Narimatsu, Hitomi Inada, Takahiro Kawashima, NEC TOSHIBA Space Systems, Ltd. (Japan); Akira Iwasaki, The Univ. of Tokyo (Japan) . . . . . [7826-73]

SESSION 17
Room: Diamant . . . . . .Thurs. 13.40 to 17.10

Global Earth Observation System of Systems

Session Chair: **Shahid Habib,** NASA Goddard Space Flight Ctr. (USA)

13.40: **A decade of disaster and natural hazards monitoring with the ASTER instrument on NASA's terra platform**, Michael J. Abrams, Jet Propulsion Lab. (United States). . . . . [7826-74]

14.00: **Future plans for NASA/GSFC flight missions**, Lisa W. Callahan, NASA Goddard Earth Sciences and Technology Ctr. (United States) . . . . . [7826-98]

14.20: **Remote Sensing-based Correlation Analysis between UVB-Exposure and Skin Cancer- Recent Trend in the Continental US**, Ni-Bin Chang, Univ. of Central Florida (United States); Rui Feng, University of Pennsylvania (United States); Zhiqiang Gao, Chinese Academy of Science (China); Wei Gao, Colorado State University (United States) . . . . [7826-75]

14.40: **A remote sensing soil disturbance model of Valley Fever pathogen propagation in southern Arizona**, Frederick S. Pianalto, The Univ. of Arizona (United States) . . . . . [7826-76]

Coffee Break . . . . . 15.00 to 15.30

15.30: **Monitoring of ambient fine particulate matter concentrations from space: application to European and African cities**, Jean-Francois Léon, Cathy Liousse, Corinne Galy-Lacaux, Thierno Doumbia, Observatoire Midi-Pyrénées (France); Hélène Cachier, Lab. des Sciences du Climat et de l'Environnement (France) . . . . . [7826-77]

15.50: **Overview of remote sensing applications for assessing and monitoring natural hazards in Cyprus**, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus); Skevi Perdikou, Frederick Institute of Technology (Cyprus) . . . . . [7826-78]

16.10: **Satellite remote sensing, GIS and sun-photometers for monitoring PM10 in Cyprus: issues on public health**, Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Alexandros Matsas, Vassilis P. Trigkas, Argyro Nisantzi, Cyprus Univ. of Technology (Cyprus) . . [7826-79]

16.30: **a survey of the six imperial mausoleums of the southern Song dynasty using multi-remote sensing methods**, Weiping Zhu, Hangzhou Normal Univ. (China); Bangbin Wang, Zhejiang Univ. (China); Junfeng Xu, Hangzhou Normal Univ. (China); Shiqiang Huang, East China Investigation and Design Institute (China) . . . . . [7826-80]

16.50: **Identification of informal settlements areas using object oriented analysis**, Housein A. Mashee, Technical Collage in Riyadh (Saudi Arabia) . . . . . [7826-81]

Tuesday-Thursday 21-23 September 2010 • Proceedings of SPIE Vol. 7827

Remote Sensing of Clouds and the Atmosphere

Conference Chairs: **Richard H. Picard,** Air Force Research Lab. (USA); **Klaus Schäfer,** Karlsruhe Institute of Technology (Germany); **Adolfo Comeron,** Univ. Politècnica de Catalunya (Spain); **Michiel van Weele,** Koninklijk Nederlands Meteorologisch Instituut (Netherlands)

Programme Committee: **Aldo Amodeo,** Consiglio Nazionale delle Ricerche (Italy); **Evgueni I. Kassianov,** Pacific Northwest National Lab. (USA); **Christopher J. Mertens,** NASA Langley Research Ctr. (USA); **Nicolaos I. Sifakis,** National Observatory of Athens (Greece); **Konradin Weber,** Fachhochschule Düsseldorf (Germany)

Tuesday 21 September

SESSION JS1

Room: Argos . . . . . Tues. 13.50 to 17.30

Joint Session: Lidar Measurements during Recent 2010 Eyjafjallajökull Volcanic Eruption

Session Chairs: **Upendra N. Singh,** NASA Langley Research Ctr. (USA); **Adolfo Comeron,** Univ. Politècnica de Catalunya (Spain); **Klaus Schäfer,** Karlsruher Institut für Technologie (Germany)

Joint Session with Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing (Conference 7832)

13.50: **EARLINET observations of the Eyjafjallajökull ash plume over Europe** *(Invited Paper)*, Gelsomina Pappalardo, Aldo Amodeo, Consiglio Nazionale delle Ricerche (Italy); Albert Ansmann, Leibniz Institut für Troposphärenforschung (Germany); Arnoud Apituley, Rijksinstituut voor Volksgezondheid en Milieu (Netherlands); Lucas Alados-Arboledas, Univ. de Granada (Spain); Dimitris S. Balis, Aristotle Univ. of Thessaloniki (Greece); Christine Böckmann, Univ. Potsdam (Germany); Anatoli Chaikovsky, Institute of Physics (Belarus); Adolfo Comeron, Univ. Politècnica de Catalunya (Spain); Giuseppe D'Amico, Consiglio Nazionale delle Ricerche (Italy); Volker Freudenthaler, Ludwig-Maximilians-Univ. München (Germany); Ivan V. Grigorov, Institute of Electronics (Bulgaria); Ove K. Gustafsson, Swedish Defence Research Agency (Sweden); Stefan Kinne, Holger Linne, Max-Planck-Institut für Meteorologie (Germany); Fabio Madonna, Consiglio Nazionale delle Ricerche (Italy); Ina Mattis, Leibniz Institut für Troposphärenforschung (Germany); Lucia Mona, Consiglio Nazionale delle Ricerche (Italy); Detlef Müller, Leibniz Institut für Troposphärenforschung (Germany); Valentin Mitev, Observatoire Cantonal de Neuchâtel (Switzerland); Doina N. Nicolae, National Institute of Research & Development for Optoelectronics (Romania); Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Maria Rita Perrone, Univ degli Studi di Lecce (Italy); Aleksander Pietruczuk, Institute of Geophysics (Poland); Manuel Pujadas, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Je . . . . . [7832-17]

14.20: **Eyjafjallajökull volcano ash plume detection in the frame of the new constituting Lidar network Leonet**, Simone Lolli, Leosphere France (France); Sebastien Conil, Andra (France); Alain Dabas, Meteo France (France); Dave Donovan, KNMI (Netherlands); Sven-Erik Gryning, Torben Mikkelsen, Risø (Denmark); Hugo Ricketts, University of Manchester (United Kingdom); Laurent Sauvage, Leosphere France (France); Geraint Vaughan, University of Manchester (United Kingdom); Joerg Walter, University Leipzig (Germany); Frank Wienhold, ETHZ (Switzerland) . . . . . [7832-18]

14.40: **Lidar observations of the Eyjafjallajökull volcanic ash plume at Leipzig, Germany**, Matthias Tesche, Albert Ansmann, Anja Hiebsch, Ina Mattis, Jörg Schmidt, Patric Seifert, Ulla Wandinger, Leibniz Institute for Tropospheric Research (Germany) . . . . . [7832-19]

15.00: **Characterization of the Eyjafjallajökull ash-plume by means of Lidar measurements over the Munich EARLINET-site**, Silke Gross, Volker Freudenthaler, Josef Gasteiger, Franziska Schnell, Matthias Wiegner, Ludwig-Maximilians-Univ. München (Germany) . . . . . [7832-20]

Coffee Break 15.20

15.50: **Mix of volcanic ash and Saharan dust over Romania during Eyjafjallajokull eruption**, Doina N. Nicolae, Anca V. Nemuc, Livio Belegante, National Institute of Research & Development for Optoelectronics (Romania) . . . . . [7832-21]

16.10: **EARLINET observations of the Eyjafjallajökull ash plume over Greece**, Dimitris S. Balis, Elina Giannakaki, Aristotle Univ. of Thessaloniki (Greece); Rodanthi Elizabeth Mamouri, Panayiotis Kokkalis, Alexandros Papayannis, Giorgos Tsaknakis, ... [7832-22]

16.30: **Airborne measurements of the Eyjafjallajökull volcanic ash plume over north-western part of Germany by means of an optical particle counter and a passive mini-DOAS remote sensing system mounted on a light sport aircraft**, Konradin Weber, Christian Fischer, Günther Van Haren, Tobias Pohl, Andreas Vogel, Univ. of Applied Sciences Düsseldorf (Germany) . . . . . [7832-23]

16.50: **Optical properties characterization of Iceland volcanic particles by UV polarization Lidar at Lyon, SW Europe**, Alain Miffre, Gregory David, Benjamin Thomas, Univ. Claude Bernard Lyon 1/CNRS (France); Patrick Rairoux, Univ. Claude Bernard Lyon 1/CNRS (Germany) . . . . . [7832-24]

17.10: **Temporal and spatial structure of a volcanic ash cloud - ground-based remote sensing and numerical modeling,** Klaus Schäfer, Stefan M. Emeis, Wolfgang Junkermann, Peter Suppan, Karlsruher Institut für Technologie (Germany); Wolfgang Fricke, Harald Flentje, Werner Thomas, Stefan Gilge, Deutscher Wetterdienst (Germany); Ludwig Ries, Frank Meinhard, Umweltbundesamt (Germany); Matthias Wiegner, Volker Freudenthaler, Silke Gross, Ludwig-Maximilians-Univ. München (Germany); Christoph Münkel, Vaisala GmbH (Germany); Josef Cyrys, Anette Peters, Michael Pitz, Jürgen Schnelle-Kreis, Helmholtz Zentrum München GmbH (Germany); Hendrik Elbern, Rhenish Institute of Environmental Research (Germany); Bernhard Vogel, Karlsruher Institut für Technologie (Germany) . . . . . [7832-25]

Posters—Tuesday

Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Remote Sensing of Clouds

A dual frequency millimetre wave radar for cloud characterization, Helmut W. Essen, Stefan Sieger, Fraunhofer FHR (Germany) . . . [7827-34]

Atmospheric Profiling of Aerosols, Trace Gases and Meteorological Parameters

Validation for current GOES platforms of the fog detection product proposed by Ellrod (2000), Caitlin J. Hart, Rochester Institute of Technology (United States) and The College at Brockport, State Univ. of New York (United States) and Cooperative Institute for Meteorological Satellite Studies (United States); Gustavo Pereira, The College at Brockport, State Univ. of New York (United States) . . . . . [7827-12]

A novel method to retrieve atmospheric water vapor using MODIS data, Xinming Wang, C4ISR National Defence Science and Technology Key Lab. (China) . . . . . [7827-35]

A method analyzing aerosol particle shape and scattering based on imaging, Shiyong Shao, Yongbang Yao, Ruizhong Rao, Anhui Institute of Optics and Fine Mechanics (China). . . . . [7827-36]

Detection of hazardous storms over South Africa using MSG/SEVIRI image data, Caroline H. Hardy, Andre L. Nel, Univ. of Johannesburg (South Africa). . . . . [7827-37]

AERONET and Euroskyrad (ESR) aerosol optical depth intercomparison on Cimel CE318 and Prede POM01 radiometers, Víctor Estellés, Univ. de València (Spain); Monica Campanelli, Instituto di Scienze dell'Atmosfera e del Clima (Italy); Timothy J. Smyth, Plymouth Marine Lab. (United Kingdom); Pilar Utrillas, Univ. de València (Spain) . . . . . [7827-38]

The infrared scatter characteristics of dust aerosol and cloud droplet particle, Zengzhou Hao, Fang Gong, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [7827-39]

Remote Sensing by FTIR, DOAS, and Other Spectrometric Methods

Development of a VDI guideline for passive FTIR measurements in the atmosphere, Klaus Schäfer, Karlsruher Institut für Technologie (Germany); Roland Harig, Technische Univ. Hamburg-Harburg (Germany); Thomas Blumenstock, Karlsruher Institut für Technologie (Germany); Norbert Höfert, Verein Deutscher Ingenieure (Germany); Konradin Weber, Fachhochschule Düsseldorf (Germany) . . . . . [7827-40]

Temporal and spatial characteristics of atmospheric methane in the Yangtze River basin and the analysis of the main environmental impact factors, Hongxiu Wan, Nanjing Institute of Geography and Limnology (China) and Nanjing Univ. (China); Zhihao Qin, Nanjing Univ. (China); Yuanbo Liu, Nanjing Institute of Geography and Limnology (China); Yongming Xu, Xiuying Zhang, Nanjing Univ. (China) . . . . [7827-41]

Lidar, Radar, and Passive Atmospheric Measurement Techniques

Mapping temporal evolution of precipitable water vapor (PWV) in troposphere by interferometric SAR and GPS data, Pedro J. B. Mateus, Giovanni Nico, João C. Fernandes, Univ. of Lisbon (Portugal) . . . [7827-42]

Interpolating MERIS and GPS measurements of precipitable water vapor (PWV) to estimate atmospheric phase delay maps, Pedro J. B. Mateus, Giovanni Nico, João C. Fernandes, Univ. of Lisbon (Portugal) . . . . . [7827-43]

Comparison of precipitable water vapor (PWV) maps derived by GPS, SAR interferometry and numerical forecasting models, Pedro J. B. Mateus, Giovanni Nico, Ricardo Tomé, João C. Fernandes, Pedro Miranda, Univ. of Lisbon (Portugal) . . . . . [7827-44]

Cloud detection and characterization, Sanmei Li, China Meteorological Administration (China) and Institute of Urban Meteorology (China) . . . . . [7827-45]

Remote Sensing of the Middle and Upper Atmosphere

Investigation of ionospheric slab thickness over Cyprus during minimum solar activity, Haris Haralambous, Frederick Univ. (Cyprus); George Dekoulis, Lancaster Univ. (United Kingdom) . . . . . [7827-46]

Correlated space and ground studies of geomagnetic plasma disturbances, George Dekoulis, Lancaster Univ. (United Kingdom) . . . . . [7827-47]

Wednesday 22 September

Welcome and Introduction

Room: Argos . . . . . Wed. 09.20 to 9.30

Richard H. Picard, Air Force Research Lab. (USA)

SESSION 1

Room: Argos . . . . . Wed. 09.30 to 10.10

Remote Sensing of Clouds

Session Chair: **Evgueni I. Kassianov,** Pacific Northwest National Lab. (USA)

09.30: **Estimating scaled cloud optical thickness from SEVIRI by implementing a semi-analytical cloud retrieval algorithm**, Praveen K. Pandey, Flemish Institute for Technological Research (Belgium) and Katholieke Univ. Leuven (Belgium); Koen De Ridder, Flemish Institute for Technological Research (Belgium); Nicole Van Lipzig, Katholieke Univ. Leuven (Belgium) . . . . . [7827-02]

09.50: **The use of EUMETSAT cloud mask product for astronomical site testing**, Marc S. Sarazin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) . . . . . [7827-03]

Coffee Break . . . . . 10.10 to 10.40

SESSION 2

Room: Argos . . . . . Wed. 10.40 to 12.00

Lidar, Radar, and Passive Atmospheric Measurement Techniques

Session Chair: **Adolfo Comeron,** Univ. Politècnica de Catalunya (Spain)

10.40: **Atmospheric boundary layer height estimation by adaptive Kalman filtering of Lidar data**, Sergio Tomás, Francesc Rocadenbosch, Michaël Sicard, Univ. Politècnica de Catalunya (Spain) . . . . . [7827-05]

11.00: **Supercooled large drop detection with NASA's Icing Remote Sensing System**, David J. Serke, National Ctr. for Atmospheric Research (United States); Andrew L. Reehorst, NASA Glenn Research Ctr. (United States); Marcia K. Politovich, National Ctr. for Atmospheric Research (United States) . . . . . [7827-06]

11.20: **Application of continuous remote sensing of mixing layer height for assessment of airport air quality**, Klaus Schäfer, Stefan M. Emeis, Carsten Jahn, Maria Hoffmann, Karlsruher Institut für Technologie (Germany); Costas Helmis, George Sgouros, National and Kapodistrian Univ. of Athens (Greece); Ralf Kurtenbach, Peter Wiesen, Bergische Univ. Wuppertal (Germany); Evi Anamaterou, Michael O'Connor, Athens International Airport S.A. (Greece); Christoph Münkel, Vaisala GmbH (Germany) . . . . . [7827-07]

11.40: **Comparison of different methods for long-term continuous remote sensing of mixing layer height**, Klaus Schäfer, Stefan M. Emeis, Carsten Jahn, Roman Friedl, Markus Höß, Karlsruher Institut für Technologie (Germany); Christoph Münkel, Vaisala GmbH (Germany) . . . . . [7827-08]

Lunch/Exhibition Break . . . . . 12.00 to 14.00

SESSION 3

Room: Argos . . . . . Wed. 14.00 to 15.20

Atmospheric Profiling of Aerosols, Trace Gases, and Meteorological Parameters I

Session Chair: **Adolfo Comeron,** Univ. Politècnica de Catalunya (Spain)

14.00: **Retrieval of atmospheric CO_2 and CH_4 from GOSAT short wave infrared observations using PPDF-based method**, Andrey I. Bril, Sergey Oshchepkov, Yukio Yoshida, Isamu Morino, Osamu Uchino, Tatsuya Yokota, National Institute for Environmental Studies (Japan) . . . . [7827-09]

14.20: **The quest for an OCO (Orbiting Carbon Observatory) re-flight**, Ralph R. Basilio, Thomas R. Livermore, Y. Janet Shen, H. R. Pollock, Jet Propulsion Lab. (United States) . . . . . [7827-10]

14.40: **The Atmospheric Infrared Sounder (AIRS) on the NASA Aqua Spacecraft: a general remote sensing tool for understanding atmospheric structure, dynamics and composition**, Thomas S. Pagano, Moustafa T. Chahine, Eric J. Fetzer, Jet Propulsion Lab. (United States) . . . . . [7827-11]

15.00: **Wavelet modelling of the tropospheric refractivity structure from GPS slant delay observations located in the tropical Tahiti Island**, Jonathan Serafini, Lydie Sichoix, Jean-Pierre Barriot, Univ. de la Polynésie Française (French Polynesia) . . . . . [7827-13]

Coffee Break . . . . . 15.20 to 15.50

SESSION 4

Room: Argos . . . . . Wed. 15.50 to 16.50

Atmospheric Profiling of Aerosols, Trace Gases, and Meteorologica Parameters II

Session Chairs: **Klaus Schäfer,** Karlsruher Institut für Technologie (Germany); **Michiel van Weele,** Koninklijk Nederlands Meteorologisch Instituut (Netherlands)

15.50: **Spectro-radiometric measurements of non-variant targets intended for the removal of atmospheric effects from satellite images: the case study of Lemesos area in Cyprus**, Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Alexandros Matsas, Vassilis P. Trigkas, Cyprus Univ. of Technology (Cyprus); Adrianos Retalis, National Observatory of Athens (Greece); Nektarios Chrysoulakis, Institute of Applied and Computational Mathematics-FORTH (Greece) . . . . . [7827-14]

16.10: **Accuracy assessment of atmospheric correction algorithms using sun-photometers (AERONET), Lidar system and in-situ spectroradiometers**, Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Cyprus Univ. of Technology (Cyprus) . . . . . [7827-15]

16.30: **New method of deducing the refractive index of individual aerosol particles**, Wenyue Zhu, Xuebin Li, Heli Wei, Jie Zhan, Anhui Institute of Optics and Fine Mechanics (China). . . . . [7827-17]

Thursday 23 September

SESSION 5

Room: Argos . . . . . .Thurs. 09.20 to 10.00

Atmospheric Profiling of Aerosols, Trace Gases, and Meteorological Parameters III

Session Chairs: **Klaus Schäfer,** Karlsruher Institut für Technologie (Germany); **Michiel van Weele,** Koninklijk Nederlands Meteorologisch Instituut (Netherlands)

9.20: **CHRISTINE: code for high resolution satellite mapping of optical thickness and of Ångstrom exponent**, Nicolaos I. Sifakis, National Observatory of Athens (Greece); Christos Iossifidis, National Technical Univ. of Athens (Greece); Charalambos C. Kontoes, National Observatory of Athens (Greece). . . . . [7827-20]

09.40: **Study of AERONET data of nearby stations: application to infer astronomical extinction coefficient at elevated altitudes**, Aziza Bounhir, Zouhair Z. Benkhaldoun, Univ. Cadi Ayyad (Morocco). . [7827-21]

Coffee Break . . . . . 10.00 to 10.30

SESSION 6

Room: Argos . . . . . .Thurs. 10.30 to 11.50

Remote Sensing by FTIR, DOAS, and Other Spectrometric Methods

Session Chair: **Konradin Weber,** Fachhochschule Düsseldorf (Germany)

10.30: **Long-term air quality study by DOAS within Beijing**, Klaus Schäfer, Peter Suppan, Karlsruher Institut für Technologie (Germany); Yuesi Wang, Jinyian Xin, Hong Ling, Institute of Atmospheric Physics (China) . . . . . [7827-22]

10.50: **An infrared hyperspectral sensor for remote sensing of gases in the atmosphere,** Samer Sabbah, Peter Rusch, Jörn-Hinnrich Gerhard, Sigma ElectroOptics (Germany); Roland Harig, Gerhard, Sigma ElectroOptics (Germany) and Hamburg Univ. of Technology (Germany) [7827-49]

11.10: **Carbonyl compounds and generation of tropospheric ozone**, Taieb Gasmi, Saint Louis Univ., Madrid Campus (Spain) . . . . . [7827-23]

11.30: **Development of wireless gas detector by laser doping technique in silicon carbide**, Geunsik Lim, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Tariq Manzur, S&T Lead, I&EW (United States); Aravinda Kar, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States) . . . . . [7827-24]

Lunch Break . . . . . 11.50 to 13.20

SESSION 7

Room: Argos . . . . . .Thurs. 13.20 to 14.20

Remote Sensing of the Middle and Upper Atmosphere

Session Chair: **Christopher J. Mertens,** NASA Langley Research Ctr. (USA)

13.20: **Comparison of statistical models for atmospheric limb radiance structure**, Carine Quang, Valérie Rialland, Antoine Roblin, ONERA (France); Francis Dalaudier, Lab. Atmosphères, Milieux, Observations Spatiales (France) . . . . . [7827-25]

13.40: **Low-latitude thermal semidiurnal tide: longitudinal and seasonal variations based on ground-based measurements from Arecibo and Maui, space-based measurements by SABER, and modeling with GSWM-02**, Jonathan S. Friedman, Arecibo Observatory (United States); Xiaoli Zhang, Xinzhao Chu, Jeffrey M. Forbes, Univ. of Colorado at Boulder (United States) . . . . . [7827-26]

14.00: **STORM-E model geomagnetic storm corrections to E-region electron densities developed from TIMED/SABER near-infrared limb emission measurements**, Christopher J. Mertens, NASA Langley Research Ctr. (United States); Xiaojing Xu, Science Systems and Applications, Inc. (United States); Jose Fernandez, NASA Langley Research Ctr. (United States); Dieter Bilitza, George Mason Univ. (United States); Martin G. Mlynczak, NASA Langley Research Ctr. (United States) . . . . . [7827-27]

SESSION 8

Room: Argos . . . . . .Thurs. 14.20 to 15.00

Radiative Transfer I

Session Chair: **Christopher J. Mertens,** NASA Langley Research Ctr. (USA)

14.20: **Putting Terra CERES instruments on the same radiometric scale**, Z. Peter Szewczyk, Science Systems and Applications, Inc. (United States); Kory J. Priestley, Norman G. Loeb, NASA Langley Research Ctr. (United States); G. Louis Smith, National Institute of Aerospace (United States) . . . . . [7827-28]

14.40: **The OMPS Limb Profiler instrument: two-dimensional retrieval algorithm**, Didier F. Rault, NASA Langley Research Ctr. (United States) . . . . . [7827-29]

Coffee Break . . . . . 15.00 to 15.30

SESSION 9

Room: Argos . . . . . .Thurs. 15.30 to 16.50

Radiative Transfer II

Session Chair: **Richard H. Picard,** Air Force Research Lab. (USA)

15.30: **Retrieval of intensive aerosol properties from MFRSR observations: partly cloudy cases**, Evgueni I. Kassianov, James C. Barnard, Connor Flynn, Charles N. Long, Larry K. Berg, Pacific Northwest National Lab. (United States). . . . . [7827-30]

15.50: **The effect of turbulent temperature fluctuations on vapor detection by ground-based passive infrared sensors at near horizon line of sight**, Avishai Ben-David, U.S. Army Edgewood Chemical Biological Ctr. (United States); Agustin I. Ifarraguerri, SAIC (United States) . . . . . [7827-31]

16.10: **Recent advances in the simulation of partly cloudy scenes**, Steven C. Richtsmeier, Robert L. Sundberg, Spectral Sciences, Inc. (United States). . . . . [7827-48]

16.30: **Monte Carlo modeling in the problem of LIDAR remote sensing of clouds from satellites,** Boris A. Kargin, Arseny B. Kargin, Institute of Computational Mathematics and Mathematical Geophysics (Russian Federation); Maksim V. Lavrov, Novosibirsk State Univ. (Russian Federation) . . . . . [7827-33]

Closing Remarks

Room: Argos . . . . . .Thurs. 16.50 to 17.00

Richard H. Picard, Air Force Research Lab. (USA)

Monday-Tuesday 20-21 September 2010 • Proceedings of SPIE Vol. 7828

Optics in Atmospheric Propagation and Adaptive Systems

Monday 20 September

Welcome and Introduction

Room: Ariane 2 . . . . . Mon. 13.40 to 13.50

Karin Stein, Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB (Germany)

SESSION 1

Room: Ariane 2 . . . . . Mon. 13.50 to 16.40

Modelling of the Environment

Session Chair: **Karin Stein,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

13.50: **Overview of MATISSE-v2.0** *(Invited Paper)*, Luc Labarre, Karine Caillault, Sandrine Fauqueux, Claire Malherbe, Pierre Simoneau, ONERA (France) . . . . . [7828-01]

14.20: **Multiresolution infrared optical properties for Gaussian sea surfaces: theoretical validation in the one-dimensional case**, Sandrine Fauqueux, Karine Caillault, Pierre Simoneau, Luc Labarre, ONERA (France) . . . . . [7828-02]

14.40: **EOSTAR Pro: a flexible extensive library to assess EO sensor performance**, Marianne A. C. Degache, Alexander M. J. van Eijk, TNO Defence, Security and Safety (Netherlands); Dimitris Tsintikidis, Stephen M. Hammel, Space and Naval Warfare Systems Command (United States) . . . . . [7828-03]

Coffee Break . . . . . 15.00 to 15.30

15.30: **Neon: the UK Met Office electro-optic Tactical Decision Aid-current and future capability** *(Invited Paper)*, Warren Lewis, Met Office (United Kingdom). . . . . [7828-04]

16.00: **Global predictions of the optical sensing through turbulence**, Sylvain Cheinet, Institut Franco-Allemand de Recherches de Saint-Louis (France); Yvonick Hurtaud, Ctr. d'Expertise Parisien (France); Karin R. Weiss-Wrana, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); A. Beljaars, European Ctr. for Medium-Range Weather Forecasts (United Kingdom) . . . . . [7828-05]

16.20: **High-speed and high-power VCSELs based on InP suitable for MEMS technology,** Tobias Gruendl, Technische Univ. München (Germany) . . . . . [7828-06]

Remote Sensing Europe 2010: Plenary Session

Monday 20 September, 17.35 to 19:05 hrs

For details see p. 7

Tuesday 21 September

SESSION 2

Room: Ariane 2 . . . . . Tues. 08.40 to 10.00

Characterization of Atmospheric Turbulence

Session Chair: **Marc J. F. Séchaud,** ONERA (France)

08.40: **Study of turbulence effects for a free-space optical link over water**, Ruth Mackey, Mingzhou Chen, National Univ. of Ireland, Galway (Ireland); Andrew J. Lambert, UNSW@ADFA (Australia) and National Univ. of Ireland, Galway (Ireland); David S. Mackey, Alexander V. Goncharov, National Univ. of Ireland, Galway (Ireland) . . . . . [7828-07]

09.00: **Preliminary results of the FATMOSE atmospheric propagation trials, carried out in the False Bay, South Africa, from November 2009-July 2010**, Arie N. de Jong, TNO Defence, Security and Safety (Netherlands) . . . . . [7828-08]

09.20: **Passive cross-wind remote sensing using optical turbulence-induced fluctuations**, Omer Porat, Joseph Shapira, Soreq Nuclear Research Ctr. (Israel) . . . . . [7828-09]

09.40: **Cn_2 profile measurement from Shack-Hartmann data: experimental validation and exploitation**, Nicolas Védrenne, Aurélie Montmerle Bonnefois, Clélia Robert, Vincent Michau, Joseph Montri, Bruno Fleury, ONERA (France) . . . . . [7828-10]

Coffee Break . . . . . 10.00 to 10.30

SESSION 3

Room: Ariane 2 . . . . . Tues. 10.30 to 11.50

Propagation through Turbulent Media

Session Chair: **Denis Dion, Jr.,** Defence Research and Development Canada (Canada)

10.30: **The effect of dense aerosol cloud on the 3D information contain of flash Lidar**, Gregoire Tremblay, AEREX avionique inc. (Canada); Xiaoying Cao, Royal Military College of Canada (Canada); Gilles A. Roy, Defence Research and Development Canada (Canada) . [7828-11]

10.50: **Description of a remotely-controlled Short Wave Infrared (SWIR) skyglow measurement system**, John D. Gonglewski, Air Force Research Lab. (United States); David C. Dayton, Applied Technology Associates (United States) . . . . . [7828-12]

11.10: **Spatial and temporal variability of SWIR air glow measurements**, David C. Dayton, Applied Technology Associates (United States); Michael Myers, John D. Gonglewski, Air Force Research Lab. (United States). . . . . [7828-13]

11.30: **Problems related to the beam propagation in the tubulent atmosphere**, Fedor V. Shugaev, Evgeni N. Terentiev, Ludmila S. Shtemenko, Tatiana A. Petrova, Olga I. Dokukina, Lomonosov Moscow State Univ. (Russian Federation) . . . . . [7828-14]

Lunch/Exhibition Break . . . . . 11.50 to 13.20

SESSION 4
Room: Ariane 2 . . . . . Tues. 13.20 to 16.10

Adaptive Optic Systems

Session Chair: **John D. Gonglewski,** Air Force Research Lab. (USA)

13.20: **Fast, computer-free, holographic adaptive optics** *(Presentation Only)*, Geoff P. Andersen, U.S. Air Force Academy (United States) . . . . . [7828-15]

13.40: **Incoherent phase-compensated imaging based on a field scattered by rough surface**, Vadim V. Dudorov, Valeriy V. Kolosov, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) . . . . . [7828-16]

14.00: **Possibilities of LGS application**, Vladimir P. Lukin, Lidia A. Bolbasova, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) . . . . . [7828-17]

14.20: **Wavefront sensors for adaptive optical systems**, Vladimir P. Lukin, Peter A. Konyaev, Oleg N. Emaleev, V.E. Zuev Institute of Atmospheric Optics (Russian Federation); Nina N. Botugina, V.E. Zuev Institute of Atmospheric Optics (United States) . . . . . [7828-18]

14.40: **Experience of AO systems usage on solar astronomical telescope BSVT**, Viktor P. Grigoryev, Pavel G. Kovadlo, Evgenii I. Skomorovski, Institute of Solar-Terrestrial Physics (Russian Federation); Peter A. Konyaev, Leonid V. Antoshkin, Vladimir P. Lukin, Oleg N. Emaleev, Nina N. Botugina, ; Evgeny A. Kopylov, V.E. Zuev Institute of Atmospheric Optics (Russian Federation). . . . . [7828-19]

Coffee Break . . . . . 15.00 to 15.30

15.30: **Adaptive optics system for the observation of terrestrial point-like sources: results and problems**, Gabriele Marchi, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . [7828-20]

15.50: **SCALPEL: a long range free-space optical telecommunication system with adaptive optics in the MIR bandwidth**, Aurélie Montmerle Bonnefois, Rudolph Biérent, Sophie Derelle, Anne Durécu, Antoine Godard, Michel Lefebvre, Myriam Raybaut, Nicolas Vedrenne, ONERA (France) . . . . . [7828-21]

SESSION 5
Room: Ariane 2 . . . . . Tues. 16.10 to 17.10

Image Reconstruction

Session Chair: **David C. Dayton,**
Applied Technology Associates (USA)

16.10: **The impact of low signal-to-noise ratio values on the achievability of Cramér-Rao lower bounds with multi-frame blind deconvolution algorithms**, Charles L. Matson, Air Force Research Lab. (United States); Michael B. Flanagan, SAIC (United States); Robert A. Vincent, Air Force Institute of Technology (United States) . . . . . [7828-22]

16.30: **Software-based mitigation of image degradation due to atmospheric turbulence**, Claudia S. Huebner, Corinne Scheifling, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [7828-23]

16.50: **Iterative correction procedure for images degraded by turbulence**, Corinne Scheifling, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [7828-24]

Wednesday-Thursday 22-23 September 2010 • Proceedings of SPIE Vol. 7829

SAR Image Analysis, Modeling, and Techniques

Conference Chair: **Claudia Notarnicola,** EURAC-Institute for Applied Remote Sensing (Italy)

Programme Committee: **Richard Bamler,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Mihai P. Datcu,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Linda Marchese,** INO (Canada); **Antonio Moccia,** Univ. degli Studi di Napoli Federico II (Italy); **Nazzareno Pierdicca,** Univ. degli Studi di Roma La Sapienza (Italy); **Stefan Schneiderbauer,** EURAC research (Italy)

Tuesday 21 September

Posters—Tuesday
Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

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Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

SAR image segmentation with entropy ranking based adaptive semi-supervised spectral clustering, Xiangrong Zhang, Jie Yang, Biao Hou, Licheng Jiao, Xidian Univ. (China) . . . . . [7829-22]

Simulation studies of SAR remote sensing of double peaked ocean waves, Jingsong Yang, The Second Institute of Oceanography, SOA (China) . . . . . [7829-23]

Wednesday 22 September

SESSION JS1
Room: Spot . . . . . Wed. 13.50 to 15.10

Joint Session: SAR Data Analysis I
Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

Joint Session with Conference 7830, Image and Signal Processing for Remote Sensing

13.50: **PolSAR image despeckling based on Evidence Theory**, Saïd S. Kharbouch, Natural Resources Canada (Canada) . . . . . [7830-36]

14.10: **An evaluation of Bayesian estimators and PDF models for despeckling in the undecimated wavelet domain**, Luciano Alparone, Fabrizio Argenti, Tiziano Bianchi, Alessandro Lapini, Univ. degli Studi di Firenze (Italy) . . . . . [7829-17]

14.30: **Waterline extraction in optical images and InSAR coherence maps based on the geodesic time concept**, Fernando J. Soares, Giovanni Nico, Univ. de Lisboa (Portugal). . . . . [7830-37]

14.50: **Variance ratio for change detection in SAR imagery**, Christopher J. Willis, BAE Systems (United Kingdom) . . . . . [7829-18]

Coffee Break . . . . . 15.10 to 15.40

SESSION JS2
Room: Spot . . . . . Wed. 15.40 to 17.00

Joint Session: SAR Data Analysis II
Session Chair: **Claudia Notarnicola,** EURAC research (Italy)

Joint Session with Conference 7830, Image and Signal Processing for Remote Sensing

15.40: **Site-specific land clutter modelling based on radar remote sensing images and digital terrain data**, Andriy Kurekin, Lik-Kwan Shark, Univ. of Central Lancashire (United Kingdom); Kenneth Lever, Cardiff Univ. (United Kingdom); Darren L. J. Radford, General Dynamics UK Ltd. (United Kingdom); Andrew D. Marshall, Cardiff Univ. (United Kingdom) . . . . . [7830-38]

16.00: **A SAR multilook optronic processor for operational Earth monitoring applications**, Linda Marchese, Pascal Bourqui, Carl Vachon, Michel Doucet, INO (Canada); Bernd Harnisch, Martin Suess, European Space Research and Technology Ctr. (Netherlands); François Châteauneuf, Alain Bergeron, INO (Canada). . . . . [7829-20]

16.20: **Fringe detection in SAR interferograms**, Fernando J. Soares, Giovanni Nico, Univ. de Lisboa (Portugal). . . . . [7830-39]

16.40: **Automatic object extraction from VHR satellite SAR images using pulse coupled neural networks**, Fabio Del Frate, Daniele Latini, Chiara Pratola, Univ. degli Studi di Roma Tor Vergata (Italy) . . . . [7829-21]

Thursday 23 September

Opening Remarks
Room: Spot . . . . . Thurs. 08.50 to 09.00

Claudia Notarnicola,
EURAC-Institute for Applied Remote Sensing (Italy)

SESSION 1
Room: Spot . . . . . Thurs. 09.00 to 10.00

SAR Applications I
Session Chair: **Claudia Notarnicola,** EURAC research (Italy)

09.00: **Correction of cardinal effects in high resolution SAR imagery**, David Dubois, Ecole de Technologie Supérieure (Canada); Stephane Hardy, VIASAT GeoTechnologies (Canada); Richard Lepage, Ecole de Technologie Supérieure (Canada) . . . . . [7829-01]

09.20: **Impact of model order and estimation windows for indexing using TerraSAR-X images and model-based methods**, Daniela Espinoza-Molina, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7829-02]

09.40: **Sub-urban landscape characterization by very-high resolution X-band COSMO SAR images: first results**, Fabio Del Frate, Domenico Loschiavo, Chiara Pratola, Giovanni Schiavon, Domenico Solimini, Univ. degli Studi di Roma Tor Vergata (Italy) . . . . . [7829-03]

Coffee Break . . . . . 10.00 to 10.30

SESSION 2
Room: Spot . . . . . .Thurs. 10.30 to 12.10

SAR Applications II

Session Chair: **Emanuele Santi,**
Istituto di Fisica Applicata Nello Carrara (Italy)

10.30: **Exploitation of SAR images for the retrieval of biophysical parameters: retrieval of forest biomass from P-band SAR data** *(Invited Paper)*, Thuy Le Toan, Ludovic Villard, Franck Garestier, Julien Valteau, Alexandre Couhert, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7829-04]

11.10: **Region classification evaluation in the tropical Brazilian Amazon forest**, Graziela B. Scofield, Sidnei J. S. Sant'Anna, Luciano V. Dutra, Corina C. Freitas, Instituto Nacional de Pesquisas Espaciais (Brazil) . . . . . [7829-05]

11.30: **Assessment of slope effects on SAR images over forested lands by means of EM coherent modelling**, Ludovic Villard, Thuy Le Toan, Ctr. d'Etudes Spatiales de la Biosphère (France); Thierry Koleck, Ctr. National d'Études Spatiales (France); Pierre Borderies, ONERA (France) . . . . . [7829-06]

11.50: **Analysis of polarimetric RADARSAT2 images for soil moisture retrieval in an alpine catchment**, Luca Pasolli, Univ. degli Studi di Trento (Italy) and EURAC research (Italy); Claudia Notarnicola, EURAC research (Italy); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy); Giacomo Bertoldi, Georg Niedrist, Ulrike Tappainer, Marc Zebisch, EURAC research (Italy); Fabio Del Frate, Gaia V. Laurin, Univ. degli Studi di Roma Tor Vergata (Italy). . . . . [7829-07]

Lunch Break . . . . . 12.10 to 13.40

SESSION 3
Room: Spot . . . . . .Thurs. 13.40 to 15.00

SAR Applications III

Session Chair: **Thuy Le Toan,**
Ctr. d'Etudes Spatiales de la Biosphère (France)

13.40: **TBA1**, , ... [7829-08]

14.00: **Flooded areas assessment by integrating hydraulic flood analysis to the detailed flood maps generated with a multi-temporal image segmentation approach using Cosmo-Skymed**, Giorgio Boni, CIMA Research Foundation (Italy); Elena Angiati, Univ. degli Studi di Genova (Italy); Laura Candela, Agenzia Spaziale Italiana (Italy); Silvana G. Dellepiane, Univ. degli Studi di Genova (Italy); Giorgia Macchiavello, Roberto Rudari, CIMA Research Foundation (Italy) . . . . . [7829-09]

14.20: **Neural network adaptive algorithm applied to high resolution C-band SAR images for soil moisture retrieval in bare and vegetated areas**, Claudia Notarnicola, EURAC research (Italy); Emanuele Santi, Marco Brogioni, Simonetta Paloscia, Simone Pettinato, Istituto di Fisica Applicata Nello Carrara (Italy); Giovanni Preziosa, Politecnico di Bari (Italy); Bartolomeo Ventura, EURAC research (Italy) . . . . . [7829-10]

14.40: **Exploitation of C- and X-band SAR images for soil moisture change detection estimation in agricultural areas (PO Valley, Italy)**, Bartolomeo Ventura, EURAC research (Italy); Luca Pasolli, Univ. degli Studi di Trento (Italy); Francesca Di Giuseppe, ARPA-ServizioIdroMeteoClima (Italy); Claudia Notarnicola, M. Petitta, EURAC research (Italy); G. Bonafe, L. Caporas, ARPA-ServizioIdroMeteoClima (Italy); M. Bitelli, Univ. degli Studi di Bologna (Italy) . . . . . [7829-11]

Coffee Break . . . . . 15.00 to 15.30

SESSION 4
Room: Spot . . . . . .Thurs. 15.30 to 16.50

SAR Interferometry

Session Chair: **Claudia Notarnicola,** EURAC research (Italy)

15.30: **Atmospheric phase screen-estimation for PSInSAR applied to TerraSAR-X high resolution spotlight-data**, Markus Even, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Alexander Schunert, Leibniz Univ. Hannover (Germany); Karsten Schulz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Uwe Soergel, Leibniz Univ. Hannover (Germany). . . . [7829-12]

15.50: **Multi-temporal DInSAR analysis with X-band High-Resolution SAR data: examples and potential**, Fabio Bovenga, Alberto Refice, Consiglio Nazionale delle Ricerche (Italy); Raffaele Nutricato, Fabio Rana, GAP S.r.l. (Italy); Davide O. Nitti, Maria T. Chiaradia, Politecnico di Bari (Italy) . . . . . [7829-13]

16.10: **Neural networks and SAR Interferometry for the caharacterization of seismic events**, Fabio Del Frate, Matteo Picchiani, Giovanni Schiavon, Univ. degli Studi di Roma Tor Vergata (Italy); Salvatore Stramondo, Istituto Nazionale di Geofisica e Vulcanologia (Italy). [7829-14]

16.30: **The atmosphere effect study in SBAS D-InSAR application: a case study in Jiaxing-Huzhou Plain, China**, Fan Wang, Zhaoquan Huang, Lifan Zhou, Dengrong Zhang, Zhejiang Univ. (China). . . . [7829-16]

Monday-Wednesday 20-22 September 2010 • Proceedings of SPIE Vol. 7830

Image and Signal Processing for Remote Sensing

Conference Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

Conference Co-Chairs: **Jon Atli Benediktsson,** Univ. of Iceland (Iceland); **Sebastiano Bruno Serpico,** Univ. of Genoa (Italy)

Programme Committee: **Luciano Alparone,** Univ. degli Studi di Firenze (Italy); **Selim Aksoy,** Bilkent Univ. (Turkey); **José M. Bioucas-Dias,** Instituto Superior Técnico (Portugal); **Francesca Bovolo,** Univ. degli Studi di Trento (Italy); **Gustavo Camps-Valls,** Univ. de València (Spain); **Jocelyn Chanussot,** Institut National Polytechnique de Grenoble (France); **Chi Hau Chen,** Univ. of Massachusetts Dartmouth (USA); **David A. Clausi,** Univ. of Waterloo (Canada); **Melba M. Crawford,** Purdue Univ. (USA); **Fabio Dell'Acqua,** Univ. degli Studi di Pavia (Italy); **Giles M. Foody,** The Univ. of Nottingham (United Kingdom); **Jordi Inglada,** Ctr. National d'Études Spatiales (France); **Gabriele Moser,** Univ. degli Studi di Genova (Italy); **Allan A. Nielsen,** Technical Univ. of Denmark (Denmark); **Ryuei Nishii,** Kyushu Univ. (Japan); **Antonio J. Plaza,** Univ. de Extremadura (Spain); **John A. Richards,** The Australian National Univ. (Australia); **Anne S. Solberg,** Univ. I Oslo (Norway); **Josiane B. Zerubia,** INRIA Sophia Antipolis - Méditerranée (France)

Monday 20 September

Opening Remarks

Room: Spot . . . . . Mon. 13.40 to 13.50

Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)

SESSION 1

Room: Spot . . . . . Mon. 13.50 to 15.10

Pansharpening, Super-resolution, and Stereo

Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

13.50: **A theoretical evaluation of aliasing and misregistration effects on pansharpening methods**, Bruno Aiazzi, Istituto di Fisica Applicata Nello Carrara (Italy); Luciano Alparone, Univ. degli Studi di Firenze (Italy); Stefano Baronti, Istituto di Fisica Applicata Nello Carrara (Italy); Andrea Garzelli, Univ. degli Studi di Siena (Italy); Massimo Selva, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [7830-01]

14.10: **Super-resolution mapping using multiple observations and image halftoning approach**, Anuar M. Muad, Giles M. Foody, The Univ. of Nottingham (United Kingdom). . . . . [7830-02]

14.30: **Super-resolution mapping for accurate shoreline mapping from coarse spatial but fine temporal resolution satellite sensor data**, Wan-Hazli Wan-Kadir, Giles M. Foody, The Univ. of Nottingham (United Kingdom) . . . . . [7830-03]

14.50: **Review of low-baseline stereo algorithms and benchmarks**, Neus Sabater, Ecole Normale Supérieure de Cachan (France); Gwendoline Blanchet, Ctr. National d'Études Spatiales (France); Lionel Moisan, René Descartes Univ. (France); Andrés Almansa, Telecom ParisTech (France); Jean-Michel Morel, Ecole Normale Supérieure de Cachan (France) . . . . . [7830-04]

Coffee Break . . . . . 15.10 to 15.40

SESSION 2

Room: Spot . . . . . Mon. 15.40 to 17.00

Mathematical Morphology and Image Analysis

Session Chair: **Luciano Alparone,** Univ. degli Studi di Firenze (Italy)

15.40: **Alternating sequential filters with morphological attribute operators for the analysis of remote sensing images**, Mauro Dalla Mura, Univ. degli Studi di Trento (Italy); Jon A. Benediktsson, Univ. of Iceland (Iceland); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) . . . . . [7830-05]

16.00: **A new generic method for semi-automatic extraction of rivers and road networks in low- and mid-resolution satellite images**, Jacopo Grazzini, Scott E. Dillard, Los Alamos National Lab. (United States); Pierre Soille, European Commission Joint Research Ctr. (Italy) . . . . . [7830-06]

16.20: **Parameter-free image artifacts detection: a compression-based approach**, Avid Roman Gonzalez, Telecom ParisTech (France); Mihai P. Datcu, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7830-07]

16.40: **Object oriented image segmentation by means of multichannel mathematical morphology,** Wuilian J. Torres, Ramiro Salcedo, Fundación Instituto de Ingeniería (Venezuela). . . . . [7830-08]

Remote Sensing Europe 2010: Plenary Session

Monday 20 September, 17.35 to 19:05 hrs

For details see page 7

Tuesday 21 September

SESSION 3

Room: Spot . . . . . Tues. 08.30 to 10.10

Hyperspectral Data Analysis

Session Chair: **Gustavo Camps-Valls,** Univ. de València (Spain)

08.30: **Hyperspectral unmixing: geometric versus statistical approaches** *(Invited Paper)*, José M. Bioucas-Dias, Univ. Técnica de Lisboa (Portugal) . . . . . [7830-09]

09.10: **A non parametric approach to anomaly detection in hyperspectral images**, Tiziana Veracini, Stefania Matteoli, Marco Diani, Giovanni Corsini, Univ. di Pisa (Italy); Sergio U. de Ceglie, CISAM (Italy) . . . . . [7830-10]

09.30: **Hyperspectral unmixing method for intimate mixture model**, Jose M. Nascimento, Instituto Superior de Engenharia de Lisboa (Portugal); José M. Bioucas-Dias, Univ. Técnica de Lisboa (Portugal) . . . . . [7830-11]

09.50: **Gas plume quantification in downlooking hyperspectral LWIR**, Caroline S. Turcotte, Defence Research and Development Canada (Canada); Michael R. Davenport, Salience Analytics Inc. (Canada) . . . . . [7830-12]

Coffee Break . . . . . 10.10 to 10.40

SESSION 4

Room: Spot . . . . . Tues. 10.40 to 12.20

Segmentation

Session Chair: **Jordi Inglada,** Ctr. d'Etudes Spatiales de la Biosphère (France)

10.40: **Segmentation of very high spatial resolution panchromatic images based on wavelets and evidence theory**, Antoine Lefebvre, Univ. Européenne de Bretagne (France); Thomas Corpetti, Sino French Lab. in Computer Science, Automation and Applied Mathematics (China); Laurence Hubert-Moy, Univ. de Rennes 2 (France) . . . . . [7830-13]

11.00: **Simultaneous hierarchical segmentation and vectorization of satellite images through combined non-uniform anisotropic data sampling and triangulation**, Jacopo Grazzini, Scott E. Dillard, Lakshman Prasad, Los Alamos National Lab. (United States) . . . . . [7830-14]

11.20: **A waterfall segmentation algorithm for coastline detection in SAR images**, Fernando J. Soares, Giovanni Nico, Univ. de Lisboa (Portugal) . . . . . [7830-15]

11.40: **Object based and geo-spatial image analysis: a semi-automatic pre-operational system**, Julien Michel, CS (France); Jordi Inglada, Ctr. d'Etudes Spatiales de la Biosphère (France); Julien Malik, CS (France) . . . . . [7830-16]

12.00: **Stochastic band selection method based on a spectral angle class separability criterion,** Philippe Déliot, Myriam Kervella, ONERA (France) . . . . . [7830-62]

Lunch/Exhibition Break . . . . . 12.20 to 13.50

SESSION 5
Room: Spot . . . . . Tues. 13.50 to 15.30

Machine Learning for Classification

Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

13.50: **Supervised super-resolution to improve spatial resolution of hyperspectral images classification maps**, Alberto Villa, Institut National Polytechnique de Grenoble (France) and Univ. of Iceland (Iceland); Jon Atli Benediktsson, Univ. of Iceland (Iceland); Jocelyn Chanussot, Christian Jutten, Lab. des Images et des Signaux (France) . . . . . [7830-18]

14.10: **Unbiased query-by-bagging active learning for VHR image classification**, Loris Copa, Univ. de Lausanne (Switzerland); Devis Tuia, Univ. de València (Spain); Michele Volpi, Mikhail Kanevski, Univ. de Lausanne (Switzerland) . . . . . [7830-19]

14.30: **Multitask SVM learning for remote sensing data classification**, Jose M. Leiva, Univ. Carlos III de Madrid (Spain); Luis Gomez-Chova, Gustavo Camps-Valls, Univ. de València (Spain) . . . . . [7830-20]

14.50: **Classification of filtered multichannel images**, Vladimir V. Lukin, Dmitriy V. Fevralev, National Aerospace Univ. (Ukraine); Nikolay N. Ponomarenko, National Aerospace Univ. (Russian Federation); Andriy A. Kurekin, Lik-Kwan Shark, Univ. of Central Lancashire (United Kingdom); Benoit Vozel, Kacem Chehdi, Univ. de Rennes 1 (France) . . . . . [7830-21]

15.10: **Nonparametric feature selection and support vector machine for polarimetric SAR data classification**, Yasser Maghsoudi, Michael J. Collins, Univ. of Calgary (Canada); Donald G. Leckie, Canadian Forest Service (Canada) . . . . . [7830-22]

Coffee Break . . . . . 15.30 to 16.00

SESSION 6
Room: Spot . . . . . Tues. 16.00 to 17.20

Classification

Session Chair: **José M. Bioucas-Dias,**
Univ. Técnica de Lisboa (Portugal)

16.00: **Classification of very high resolution SAR images of urban areas by dictionary-based mixture models, copulas and Markov random fields using textural features**, Aurelie Voisin, INRIA Sophia Antipolis - Méditerranée (France); Gabriele Moser, Sebastiano B. Serpico, Univ. degli Studi di Genova (Italy); Josiane B. Zerubia, Sophia Antipolis Méditerranée (France); Vladimir A. Krylov, Lomonosov Moscow State Univ. (Russian Federation). . . . . [7830-23]

16.20: **A novel domain adaptation maximum likelihood classifier for updating land-cover maps in complex scenarios**, Kanchan Bahirat, Indian Institute of Technology, Bombay (India); Francesca Bovolo, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy); Subhasis Chaudhuri, Indian Institute of Technology, Bombay (India) . . . . . [7830-24]

16.40: **Manmade structure detection in remotely sensed images**, Orsan Aytekin, Ilkay Ulusoy, Middle East Technical Univ. (Turkey)[7830-25]

17.00: **Gaussian process classification using automatic relevance determination for SAR rarget recognition,** Xiangrong Zhang, Limin Gou, Biao Hou, Licheng Jiao, Xidian Univ. (China) . . . . . [7830-26]

Posters—Tuesday
Room: Concorde 2 . . . . . Tues. 17.45 to 19.45

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Integration between calibrated Time-of-Flight camera data and multi-image matching approach for architectural survey, Dario Piatti, Filiberto Chiabrando, Francesco Nex, Fulvio Rinaudo, Politecnico di Torino (Italy). . . . . [7830-40]

Study on the capabilities of morphological attribute profiles in change detection on VHR images, Nicola Falco, Univ. degli Studi di Trento (Italy); Mauro Dalla Mura, Univ. degli Studi di Trento (Italy) and Univ. of Iceland (Iceland); Francesca Bovolo, Univ. degli Studi di Trento (Italy); Jon A. Benediktsson, Univ. of Iceland (Iceland); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) . . . . . [7830-41]

Infrared stationary object acquisition and moving object tracking, Sengvieng Amphay, David Gray, Air Force Research Lab. (United States) . . . . . [7830-42]

Total variation restoration of the defocus image based on spectral priors, Peng Liu D.V.M., Dingsheng Liu D.D.S., Zhiwen Liu, Ctr. for Earth Observation and Digital Earth (China) . . . . . [7830-43]

Combination and evaluation of correspondence finding methods in 3D measurement systems using fringe projection, Christian Bräuer-Burchardt, Max Möller, Christoph Munkelt, Peter Kühmstedt, Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) . . . . . [7830-44]

Modeling and simulation of high-resolution SAR clutter data, Hong Zhang, Ctr. for Earth Observation and Digital Earth (China) . . . . . [7830-45]

Texture segmentation of high-resolution satellite imagery using image decomposition and weighted curve evolution, Qiuyan Huang, Nanjing Univ. (China). . . . . [7830-46]

Semantic structure tree with application to remote sensing image segmentation, Xiangrong Zhang, Xian Pan, Biao Hou, Licheng Jiao, Xidian Univ. (China) . . . . . [7830-47]

Experimental research on image motion measurement of space camera using optical joint transform correlator, Hui Zhao, Hongwei Yi, Desheng Wen, Yingcai Li, Xi'an Institute of Optics and Precision Mechanics (China). . . . . [7830-48]

Post-earthquake road damage assessment using region-based algorithms from high-resolution satellite images, Atena Haghighattalab, Mohammad J. Valadan Zoej, Ali Mohammadzadeh, Mohammad Taleai, K.N. Toosi Univ. of Technology (Iran, Islamic Republic of) . . . . . [7830-49]

House damage assesment based on supervised method: case-study on Haiti, Yoriko Kazama, Tao Guo, Hitachi, Ltd. (Japan). . . . . [7830-51]

An automatic stain removal algorithm of series aerial photograph based on flat-field correction, Gang Wang, Institute of Remote Sensing Applications (China); Dongmei Yan, Yang Yang, Ctr. for Earth Observation and Digital Earth (China) . . . . . [7830-52]

Improvement of urban land use and land cover classification approach in arid areas, Jing Qian, Qiming Zhou, Hong Kong Baptist Univ. (Hong Kong, China); Xi Chen, Xinjiang Institute of Ecology and Geography (China). . . . . [7830-53]

Multitemporal analysis of satellite imagery using summary attributes, Walter T. Barrett, Jr., MITRE Corp. (United States); Theodore Meyer, Naval Postgraduate School (United States) . . . . . [7830-54]

A methodology for the detection of land cover changes: application to the Toulouse southwestern region, Danielle Ducrot, Antoine Masse, Eric Ceschia, Claire Marais-Sicre, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [7830-55]

Improvement of change detection method for remotely sensed images based on multivariate analysis method and statistical test, Hiroshi Okumura, Kohei Arai, Saga Univ. (Japan). . . . . [7830-56]

Characteristics analysis of IR signatures by using the computer modeling and field measured for different optics surface properties, Jun-Hyuk Choi, Tae-Kuk Kim, Chung-Ang Univ. (Korea, Republic of) . . . . . [7830-57]

Vegetation cover estimation from CASI and AHS image sensors, Tomás J. Arnau, José M. Sotoca, Filiberto Pla, Univ. Jaume I (Spain) . . . . . [7830-58]

Comparative study of multi-data fusion techniques in geological features extraction, Eastern Desert, Gulf of Suez, Egypt, Safaa M. Hassan, Belal M. El Leithy, National Authority for Remote Sensing and Space Sciences (Egypt) . . . . . [7830-59]

SAR signature analysis for TerraSAR-X-based ship monitoring, Günter M. Saur, Michael Teutsch, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany). . . . . [7830-60]

Selection of regularization parameter based on generalized cross-validation in total variation remote sensing image restoration, Peng Liu, Dingsheng Liu, Ctr. for Earth Observation and Digital Earth (China) . . . . . [7830-61]

Wednesday 22 September

SESSION 7

Room: Spot . . . . . .Wed. 08.30 to 10.10

Change Detection

Session Chair: **Allan A. Nielsen,**
Technical Univ. of Denmark (Denmark)

08.30: **Linear and kernel methods for multi- and hypervariate change detection** *(Invited Paper)*, Allan A. Nielsen, Technical Univ. of Denmark (Denmark) . . . . . [7830-27]

09.10: **An automatic approach to the unsupervised detection of multiple changes in multispectral images**, Francesca Bovolo, Silvia Marchesi, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) . . [7830-28]

09.30: **Multiresolution segmentation adapted to the problem of object-based change detection**, Clemens Listner, Technische Univ. Bergakademie Freiberg (Germany); Irmgard Niemeyer, Forschungszentrum Jülich GmbH (Germany) . . . . . [7830-29]

09.50: **Unsupervised change detection by kernel clustering**, Michele Volpi, Univ. de Lausanne (Switzerland); Devis Tuia, Gustavo Camps-Valls, Univ. de València (Spain); Mikhail Kanevski, Univ. de Lausanne (Switzerland) . . . . . [7830-30]

Coffee Break . . . . . 10.10 to 10.40

SESSION 8

Room: Spot . . . . . .Wed. 10.40 to 12.20

Data Analysis

Session Chair: **Devis Tuia,** Univ. de Lausanne (Switzerland)

10.40: **Analysing multitemporal SAR images for forest mapping**, Yasser Maghsoudi, Michael J. Collins, Univ. of Calgary (Canada); Donald G. Leckie, Canadian Forest Service (Canada). . . . . [7830-31]

11.00: **A new type of remote sensors, which allow directly forming certain statistical estimates of images**, Elena G. Guk, Boris G. Podlaskin, Andrey Karpenko, Ioffe Physico-Technical Institute (Russian Federation) . . . . . [7830-32]

11.20: **Real time orthorectification by FPGA-based hardware acceleration**, David Kuo, Donald P. Gordon, Cardio Logic, Inc. (United States) . . . . . [7830-33]

11.40: **Nonlinear retrieval of atmospheric profiles from MetOp-IASI and MTG-IRS data**, Gustavo Camps-Valls, Univ. de València (Spain); Luis Guanter, Freie Univ. Berlin (Germany); Jordi Muñoz-Marí, Luis Gomez-Chova, Univ. de València (Spain); Xavier Calbet, European Organisation for the Exploitation of Meteorological Satellites (Germany) . . . . . [7830-34]

12.00: **Assessment of soil surface BRDF using an imaging spectrometer**, Zhijie Wang, Craig A. Coburn, Xiaomeng Ren, Deepayan D. Mazumdar, Steve Myshak, Aaron Mullin, Philippe M. Teillet, Univ. of Lethbridge (Canada) . . . . . [7830-35]

Lunch/Exhibition Break . . . . . 12.20 to 13.50

SESSION JS1

Room: Spot . . . . . .Wed. 13.50 to 15.10

Joint Session: SAR Data Analysis I

Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

Joint Session with Conference 7829: SAR Image Analysis, Modeling, and Techniques

13.50: **PolSAR image despeckling based on Evidence Theory**, Saïd S. Kharbouch, Natural Resources Canada (Canada) . . . . . [7830-36]

14.10: **An evaluation of Bayesian estimators and PDF models for despeckling in the undecimated wavelet domain**, Luciano Alparone, Fabrizio Argenti, Tiziano Bianchi, Alessandro Lapini, Univ. degli Studi di Firenze (Italy) . . . . . [7829-17]

14.30: **Waterline extraction in optical images and InSAR coherence maps based on the geodesic time concept**, Fernando J. Soares, Giovanni Nico, Univ. de Lisboa (Portugal). . . . . [7830-37]

14.50: **Variance ratio for change detection in SAR imagery**, Christopher J. Willis, BAE Systems (United Kingdom) . . . . . [7829-18]

Coffee Break . . . . . 15.10 to 15.40

SESSION JS2

Room: Spot . . . . . .Wed. 15.40 to 17.00

Joint Session: SAR Data Analysis II

Session Chair: **Claudia Notarnicola,** EURAC research (Italy)

Joint Session with Conference 7829: SAR Image Analysis, Modeling, and Techniques

15.40: **Site-specific land clutter modelling based on radar remote sensing images and digital terrain data**, Andriy Kurekin, Lik-Kwan Shark, Univ. of Central Lancashire (United Kingdom); Kenneth Lever, Cardiff Univ. (United Kingdom); Darren L. J. Radford, General Dynamics UK Ltd. (United Kingdom); Andrew D. Marshall, Cardiff Univ. (United Kingdom) . . . . . [7830-38]

16.00: **A SAR multilook optronic processor for operational Earth monitoring applications**, Linda Marchese, Pascal Bourqui, Carl Vachon, Michel Doucet, INO (Canada); Bernd Harnisch, Martin Suess, European Space Research and Technology Ctr. (Netherlands); François Châteauneuf, Alain Bergeron, INO (Canada). . . . . [7829-20]

16.20: **Fringe detection in SAR interferograms**, Fernando J. Soares, Giovanni Nico, Univ. de Lisboa (Portugal). . . . . [7830-39]

16.40: **Automatic object extraction from VHR satellite SAR images using pulse coupled neural networks**, Fabio Del Frate, Daniele Latini, Chiara Pratola, Univ. degli Studi di Roma Tor Vergata (Italy) . . . . [7829-21]

Earth Resources and Environmental Remote Sensing/ GIS Applications

Conference Chairs: **Ulrich Michel,** Univ. of Education Heidelberg (Germany); **Daniel L. Civco,** Univ. of Connecticut (USA)

Conference Co-Chair: **Manfred Ehlers,** Univ. Osnabrück (Germany)

Programme Committee: **Thomas Blaschke,** Paris-Lodron-Univ. Salzburg (Austria); **Tilman U. Bucher,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **John L. van Genderen,** International Institute for Geo-Information Science and Earth Observation (Netherlands); **Garik Gutman,** NASA Headquarters (USA); **Ni-Bin Chang,** Univ. of Central Florida (USA); **Martin Kappas,** Georg-August-Univ. Göttingen (Germany); **Rosa Lasaponara,** Consiglio Nazionale delle Ricerche (Italy); **Marguerite M. Madden,** The Univ. of Georgia (USA); **Derya Maktav,** Istanbul Technical Univ (Turkey); **Nicola Masini,** Consiglio Nazionale delle Ricerche (Italy); **Matthias S. Möller,** University of Bamberg (Germany) & Austrian Academy of Sciences Institute for Geographic Information (Austria); **Konstantinos G. Nikolakopoulos,** Institute of Geology & Mineral Exploration (Greece); **Pablo H. Rosso,** Univ. Osnabrück (Germany); **Florian Savopol,** Natural Resources Canada (Canada); **Jochen Schiewe,** HafenCity Univ. Hamburg (Germany); **Karsten Schulz,** Fraunhofer FOM Research Institute for Optronics and Pattern Recognition (Germany); **Alexander Siegmund,** Univ. of Education Heidelberg (Germany); **Wenzhong Shi,** The Hong Kong Polytechnic Univ. (Hong Kong, China); **Karl Staenz,** Univ. of Lethbridge (Canada); **Kerstin Voss,** Univ. Bonn (Germany); **Christiane H. Weber,** Ecole Nationale Supérieure de Physique de Strasbourg (France)

Tuesday 21 September

Opening Remarks
Room: Servanty . . . . . Tues. 13.15 to 13.20

Ulrich Michel, Univ. of Education Heidelberg (Germany);
Daniel L. Civco, Univ. of Connecticut (USA)

SESSION 1
Room: Servanty . . . . . Tues. 13.20 to 15.00

Processing Methodologies
Session Chair: **Konstantinos G. Nikolakopoulos,**
Institute of Geology & Mineral Exploration (Greece)

13.20: **Identification of quarry area based on CHRIS/Proba data**, Vassilis Tsagaris, Nikolaos Sabatakakis, Univ. of Patras (Greece) [7831-01]

13.40: **Fusion of remote sensed data and geographic information using international standards for geoinformatics**, David Arctur, George Percivall III, Open Geospatial Consortium, Inc. (United States) . . [7831-02]

14.00: **Ameliorating the spatial sesolution of Geoeye data**, Konstantinos G. Nikolakopoulos, Institute of Geology & Mineral Exploration (Greece) . . . . . [7831-40]

14.20: **Statistical convex partitioning for endmember extraction**, Saeid Asadzadeh, Amirkabir Univ. of Technology (Iran, Islamic Republic of) . . . . . [7831-03]

14.40: **Integrated use of Hyperion and ASTER data for alteration mapping**, Majid M. Oskouei, Sahand Univ. of Technology (Iran, Islamic Republic of) . . . . . [7831-04]

Coffee Break . . . . . 15.00 to 15.30

SESSION 2
Room: Servanty . . . . . Tues. 15.30 to 17.10

Infrastructures and Urban Areas I
Session Chair: **Michael Wurm,**
Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

15.30: **Integration of RADARSAT-2 multi-mode SAR data for urban land cover mapping**, Hongtao Hu, Yifang Ban, Royal Institute of Technology (Sweden) . . . . . [7831-05]

15.50: **Towards automation of building damage detection using Worldview-2 satellite image: the case of Haiti earthquake**, Tao Guo, Yoriko Kazama, Hitachi, Ltd. (Japan) . . . . . [7831-06]

16.10: **TBA**

16.30: **Integration of airborne laser scanner and multi-image techniques for map production**, Francesco Nex, Fulvio Rinaudo, Andrea Lingua, Politecnico di Torino (Italy) . . . . . [7831-08]

16.50: **Analysis of spatial pattern and dynamic land use change in typical cities of the arid environment,** Jing Qian, Qiming Zhou, Hong Kong Baptist Univ. (Hong Kong, China); Xi Chen, Xinjiang Institute of Ecology and Geography (China) . . . . . [7831-09]

Posters—Tuesday
Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Possibilities and constraints in the use of very high spatial resolution UltraCamX airborne imagery and Digital Surface Models for classification in densely built-up areas: a case study Berlin, Corinna Brüsshaber, Anna Maria Trosset, Tilman U. Bucher, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7831-07]

Monitoring the greenbelt dynamic of tourist city Hangzhou based on remote sensing, Daijian Tang, Qian Cheng, Zhejiang Gongshang Univ. (China) . . . . . [7831-41]

Metadata research and design of ocean color remote sensing data based on web service, Yan Kang, Delu Pan, Xianqiang He, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [7831-42]

Zhejiang coastal water quality monitoring by satellite data, Fang Gong, Tianming Mao, Difeng Wang, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [7831-43]

Time machine analysis for fire spread prediction, Christophe Gouinaud, Institut Supérieur d'Informatique, de Modélisation et de leurs Applications (France); Alexandre Muzzy, Univ. di Corsica Pasquale Paoli (France); Pascale Gouinaud, Institut Supérieur d'Informatique, de Modélisation et de leurs Applications (France) . . . . . [7831-44]

Extraction of land degradation information based on objected-oriented analysis using Hyperion image, Jing Wang, China Land Surveying and Planning Institute (China); Yongqi Chen, The Hong Kong Polytechnic Univ. (China); Ting He, Chunyan Lv, Aixia Liu, China Land Surveying and Planning Institute (China). . . . . [7831-45]

A improved algorithm for land surface temperature retrieval from TM/ ETM thermal infrared data in Tianjin Binhai New Area, Yang Yang, National Astronomical Observatories (China); Dongmei Yan, Ctr. for Earth Observation and Digital Earth (China) . . . . . [7831-46]

Accuracy assessment of coastal zone remote sensing survey based on high-resolution remote sensing image, Huaguo Zhang, The Second Institute of Oceanography, SOA (China) . . . . . [7831-47]

Low frequency seismic noise acquisition and analysis with tunable monolithic horizontal sensors, Fausto Acernese, Univ. degli Studi di Salerno (Italy); Rosario De Rosa, Istituto Nazionale di Fisica Nucleare (Italy); Gerardo Giordano, Rocco Romano, Silvia Vilasi, Univ. degli Studi di Salerno (Italy); Fabrizio Barone, Istituto Nazionale di Fisica Nucleare (Italy) . . . . . [7831-48]

Wednesday 22 September

SESSION 3

Room: Servanty . . . . . Wed. 08.30 to 09.10

Hazards Mitigation Geologic Application

Session Chair: **Daniel L. Civco,** Univ. of Connecticut (USA)

08.30: **Classification of geological mapping features using satellite remote sensing and in-situ spectro-radiometric measurements over Cyprus**, Constantia Achilleos, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus); Skevi Perdikou, Frederick Institute of Technology (Cyprus) . . . . . [7831-10]

08.50: **Differentiation of Neotethyan ophiolitic mélange and an approach revealing its surficial chromite deposits using ASTER image and spectral measurements (Sivas/TURKEY)**, Kaan S. Kavak, Yavuz Tore, Haluk Temiz, Cumhuriyet Üniv. (Turkey); Osman Parlak, Çukurova Üniv. (Turkey); Hande K. Cigla, Mustafa Yakan, Cumhuriyet Üniv. (Turkey) . . . . . [7831-11]

SESSION 4

Room: Servanty . . . . . Wed. 09.10 to 09.50

Sensors and Platforms

Session Chair: **Daniel L. Civco,** Univ. of Connecticut (USA)

09.10: **New architecture of tunable mechanical monolithic horizontal sensor for low frequency seismic noise measurement**, Fausto Acernese, Univ. degli Studi di Salerno (Italy); Rosario De Rosa, Istituto Nazionale di Fisica Nucleare (Italy); Gerardo Giordano, Rocco Romano, Silvia Vilasi, Univ. degli Studi di Salerno (Italy); Fabrizio Barone, Istituto Nazionale di Fisica Nucleare (Italy) . . . . . [7831-12]

09.30: **Geoeye vs Quickbird: operational potentialities, limits and integration for fast map production**, Enrico C. Borgogno Mondino, Univ. degli Studi di Torino (Italy); Filiberto Chiabrando, Politecnico di Torino (Italy) . . . . . [7831-13]

Coffee Break . . . . . 09.50 to 10.20

SESSION 5

Room: Servanty . . . . . Wed. 10.20 to 12.00

Infrastructures and Urban Areas II

Session Chair: **Tilman U. Bucher,**
Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

10.20: **Remote sensing and GIS applications in integrated suitability regulation of urban expansion under rapid coastal urbanization: a case study of Lianyungang, China**, Wen Jun Zhao, Nanjing Univ. (China) and Univ. of Copenhagen (Denmark); Xiaodong Zhu, Nanjing Univ. (China); Anette Reenberg, Univ. of Copenhagen (Denmark); Xiang Sun, Nanjing Univ. (China) . . . . . [7831-14]

10.40: **Quantification of urban structure on building block level utilizing multisensoral remote sensing data**, Michael Wurm, Hannes Taubenböck, Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7831-15]

11.00: **The global trend of urbanization: spatiotemporal analysis of mega cities using multi-temporal remote sensing, landscape metrics and gradient analysis**, Hannes Taubenböck, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Martin Wegmann, Julius-Maximilians-Univ. Würzburg (Germany); Tobias Ullmann, Michael Wurm, Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . [7831-16]

11.20: **Automatic DEM generation from low B/H stereoscopic acquisition**, Jean-Marc Delvit, Ctr. National d'Études Spatiales (France); Stéphanie Artigues, Magellium (France) . . . . . [7831-17]

11.40: **DSM from ALOS data: the case of Andritsena, Greece**, Konstantinos G. Nikolakopoulos, Panagiotis G. Tsombos, Institute of Geology & Mineral Exploration (Greece) . . . . . [7831-18]

Lunch/Exhibition Break . . . . . 12.00 to 13.40

SESSION 6

Room: Servanty . . . . . Wed. 13.40 to 15.00

Environmental Monitoring Concepts I

Session Chair: **Ulrich Michel,**
Pädagogische Hochschule Heidelberg (Germany)

13.40: **A review on derivation of biomass information in semi-arid regions based on remote sensing data**, Christina Eisfelder, Claudia Kuenzer, Stefan Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7831-19]

14.00: **Fire risk assessment tool using satellite remote sensing in Cyprus**, Kostas Papageorgiou, Agricultural Research Institute (Cyprus); Skevi Perdikou, Frederick Institute of Technology (Cyprus); Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [7831-21]

14.20: **Knowledge-based model for land use and cover changes monitoring: application to an intensive agriculture area**, Pablo Gonzalez-Moreno, Univ. de Granada (Spain); Samuel Corgne, Jean Nabucet, Laurence Hubert-Moy, Univ. de Rennes 2 (France) . . . [7831-22]

14.40: **A new model for fire forecast**, Shengli Wu, China Meteorological Administration (China) . . . . . [7831-23]

Coffee Break . . . . . 15.00 to 15.30

SESSION 7

Room: Servanty . . . . . Wed. 15.30 to 16.50

Environmental Monitoring Concepts II

Session Chair: **Hannes Taubenböck,**
Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

15.30: **Image processing for smarting browsing of ocean color data products: investigating algal blooms**, Jer P. Hayes, IBM Ireland (Ireland); Edel O'Connor, King-Tong Lau, Noel E. O'Connor, Alan F. Smeaton, Dermot Diamond, Dublin City Univ. (Ireland) . . . . . [7831-24]

15.50: **Smart monitoring of water quality in Asprokremmos Dam in Paphos, Cyprus using satellite remote sensing and wireless-sensor platform**, Christiana Papoutsa, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus); Skevi Perdikou, Frederick Institute of Technology (Cyprus) . . . . . [7831-25]

16.10: **Monitoring a quarry using high resolution data and GIS techniques**, Konstantinos G. Nikolakopoulos, Panagiotis I. Tsombos, Institute of Geology & Mineral Exploration (Greece) . . . . . [7831-26]

16.30: **Application of satellite derived information for disaster risk reduction vulnerability assessment for southwest coast of Pakistan**, Lubna Rafiq, Univ. Salzburg (Austria) and The National Space Agency of Pakistan (Pakistan) . . . . . [7831-27]

Thursday 23 September

SESSION 8

Room: Servanty . . . . . Thurs. 08.30 to 09.30

Remote Sensing and GIS in Education

Session Chair: **Daniel L. Civco,** Univ. of Connecticut (USA)

08.30: **Remote sensing and eLearning 2.0 for school education**, Kerstin Voss, Roland Goetzke, Henryk Hodam, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany) . . . . . [7831-29]

08.50: **Geoinformatics meets education for a peat bog information system**, Ulrich Michel, Christina Grunert, Pädagogische Hochschule Heidelberg (Germany); Christian Plass, Univ. Osnabrück (Germany) . . . . . [7831-30]

09.10: **TBA**, , ... [7831-74]

SESSION 9

Room: Servanty . . . . . Thurs. 09.30 to 10.30

Remote Sensing for Archaeology

Session Chair: **Rosa Lasaponara,**
Consiglio Nazionale delle Ricerche (Italy)

09.30: **On the monitoring of archaeological looting: new perspectives from space**, Rosa Lasaponara, Rosa Coluzzi, Consiglio Nazionale delle Ricerche (Italy); Nicola Masini, Consiglio Nazionale delle Ricerche (United States) . . . . . [7831-31]

09.50: **Detection, documentation and monitoring of cultural resources by using very high resolution satellite data**, Rosa Lasaponara, Rossella Coluzzi, Nicola Masini, Consiglio Nazionale delle Ricerche (Italy) [7831-32]

10.10: **Detection of archaeological crop marks in Cyprus using field spectroscopy measurements**, Athos Agapiou, Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Cyprus Univ. of Technology (Cyprus) . [7831-33]

Coffee Break . . . . . 10.30 to 11.00

SESSION 10

Room: Servanty . . . . . Thurs. 11.00 to 13.00

Environmental Monitoring Concepts III

Session Chair: **Kerstin Voss,**
Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany)

11.00: **An application of statistical technique to correct satellite data due to orbit degradation**, Md Z. Rahman, LaGuardia Community College (United States); Leonid Roytman, The City College of New York (United States); Runa Jesmin, King's College London (United Kingdom) . [7831-34]

11.20: **Land use and land cover classification with fuzzy associative rules and SPOT-5 images in Dalian, China**, Ni-Bin Chang, Univ. of Central Florida (United States); Min Han, Wei Yao, Dalian Univ. of Technology (China); Liang-Chien Chen, National Central Univ. (Taiwan); Shiguo Xu, Dalian Univ. of Technology (China) . . . . . [7831-35]

11.40: **Modeling and valuation of ecological impacts of land cover and land use changes on the Canary Islands (Tenerife)**, Sebastian Günthert, Alexander Siegmund, Simone Naumann, Pädagogische Hochschule Heidelberg (Germany) . . . . . [7831-36]

12.00: **Investigation of landscape patterns in Mouteh Wildlife Refuge, using Geographic Information Systems**, Saedeh Maleki Najafabadi, Zabol Univ. (Iran, Islamic Republic of); Alireza Sofyanian, Isfahan Univ. of Technology (Iran, Islamic Republic of); Vahid Rahdari, Zabol Univ. (Iran, Islamic Republic of) . . . . . [7831-37]

12.20: **A GIS-based habitat suitability model for Isfahan mouflon (Ovis orientalis isphahanica) in Moteh Wildlife Refuge, central Iran**, Saedeh Maleki Najafabadi, Zabol Univ. (Iran, Islamic Republic of); Mahmoud Reza Hemami, Isfahan Univ. of Technology (Iran, Islamic Republic of); Abdolrassoul Salman Mahiny, Gorgan Univ. of Agriculture and Natural Resources (Iran, Islamic Republic of); Vahid Rahdari, Zabol Univ. (Iran, Islamic Republic of) . . . . . [7831-38]

12.40: **Evaluating the Ecotourism Potentials of Naharkhoran Area in Gorgan,IRAN, Using RS and GIS**, Jafar Oladi, faculty of natural resource (Iran, Islamic Republic of); Delavar Bozorgnia, ... [7831-39]

Monday-Tuesday 20-21 September 2010 • Proceedings of SPIE Vol. 7832

Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing

Monday 20 September

Opening Remarks

Room: Argos . . . . . Mon. 13.20 to 13.30

Upendra N. Singh, NASA Langley Research Ctr. (USA)

SESSION 1

Room: Argos . . . . . Mon. 13.30 to 17.10

Lidar Techniques

Session Chairs: **Upendra N. Singh,** NASA Langley Research Ctr. (USA); **Gelsomina Pappalardo,** Consiglio Nazionale delle Ricerche (Italy)

13.30: **Advances in high-energy solid-state 2-micron laser transmitter development for ground and airborne wind and CO_2 measurements** *(Invited Paper)*, Upendra N. Singh, Jirong Yu, Michael J. Kavaya, NASA Langley Research Ctr. (United States) . . . . . [7832-01]

14.00: **An automatic planetary boundary layer height detection with a compact aerosol UV Lidar**, Laurent Sauvage, Sophie Loaec, Simone Lolli, Matthieu Boquet, Ahmed ElFilali, Leosphere France (France) . . . . . [7832-02]

14.20: **Vernier frequency sampling: a new approach for broadband high-resolution spectroscopy**, Lucile Mussio, Bertrand Hardy, Myriam Raybaut, Antoine Godard, Ajmal K. Mohamed, Michel Lefebvre, ONERA (France) . . . . . [7832-03]

14.40: **Simulation Doppler lidar measurements using WRF and Yamada-Mellor models**, Evgeniya A. Shelekhova, Alexander P. Shelekhov, V.E. Zuev Institute of Atmospheric Optics (Russian Federation); Alexander V. Starchenko, Dmitry A. Belikov, Andrey A. Barth, Tomsk State Univ. (Russian Federation) . . . . . [7832-04]

Coffee Break . . . . . 15.00 to 15.30

15.30: **Development of a fiber based eye safe coherent wind Lidar system for urban wind field measurements**, Mark F. Arend, Sameh Abdelazim, David Santoro, Fred Moshary, Barry Gross, Samir Ahmed, The City College of New York (United States) . . . . . [7832-05]

15.50: **ValidWind applications: wind power prospecting and aerosol transport**, Thomas D. Wilkerson, Alan B. Marchant, Thomas Apedaile, Jed Simmons, Space Dynamics Lab. (United States); Bill Bradford, Utah State Univ. (United States) . . . . . [7832-06]

16.10: **Interactive lidar display for multiple users utilizing network multicast**, Joshua P. Herron, Utah State Univ. (United States); William Brown, U.S. Army Dugway Proving Ground (United States); Michael D. Wojcik, Utah State Univ. (United States); George Lemire, U.S. Army Dugway Proving Ground (United States); Robert Lemon, Utah State Univ. (United States) . . . . . [7832-07]

16.30: **Wideband CO laser and Sr vapor laser in the problems of remote sensing of atmospheric gaseous components**, Oleg Romanovskii, Olga V. Kharchenko, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) . . . . . [7832-08]

16.50: **Raman water vapor lidar calibration: second phase**, Eduardo Landulfo, Renata F. da Costa, Fabio J. S. Lopes, Instituto de Pesquisas Energéticas e Nucleares (Brazil); David N. Whiteman, NASA Goddard Space Flight Ctr. (United States); Demetrius D. Venable, Howard Univ. (United States) . . . . . [7832-29]

Remote Sensing Europe 2010: Plenary Session

Monday 20 September, 17.35 to 19:05 hrs

For details see page 7

Tuesday 21 September

SESSION 2

Room: Argos . . . . . Tues. 09.00 to 10.10

Space-based Lidar

Session Chairs: **Upendra N. Singh,** NASA Langley Research Ctr. (USA); **Fabio Madonna,** Consiglio Nazionale delle Ricerche (Italy)

09.00: **The CALIPSO Mission** *(Invited Paper)*, David M. Winker, NASA Langley Research Ctr. (United States) . . . . . [7832-09]

09.30: **PBL-height retrievals from the CALIOP/CALIPSO and comparison with the ground-based Lidar and radiosonde measurements**, Yonghua Wu, Chuen Meei Gan, Lina Cordero, Barry Gross, Fred Moshary, Samir Ahmed, The City College of New York (United States) . . . . . [7832-10]

09.50: **A Lidar approach to measure atmospheric CO_2 concentrations from apace for the NASA ASCENDS Mission**, James B. Abshire, Haris Riris, Stephan R. Kawa, Xiaoli Sun, Graham Allan, Jianping Mao, Clark J. Weaver, NASA Goddard Space Flight Ctr. (United States) . . . . . [7832-11]

Coffee Break . . . . . 10.10 to 10.40

SESSION 3

Room: Argos . . . . . Tues. 10.40 to 12.20

Water vapor, Aerosol and Clouds

Session Chairs: **Eduardo Landulfo,** Instituto de Pesquisas Energéticas e Nucleares (Brazil); **Doina Nicoleta Nicolae,** National Institute of Research & Development for Optoelectronics (Romania)

10.40: **Water vapour profiling in cloudy conditions integrating Raman Lidar and passive microwave observations**, Fabio Madonna, Antonella Boselli, Aldo Amodeo, Carmela Cornacchia, Giuseppe D'Amico, Aldo Giunta, Lucia Mona, Gelsomina Pappalardo, Consiglio Nazionale delle Ricerche (Italy) . . . . . [7832-12]

11.00: **Indirect aerosol hygroscopic growth observations with a backscatter Lidar**, Eduardo Landulfo, Patricia F. Rodrigues, Fábio J. S. Lopes, Renata F. da Costa, Instituto de Pesquisas Energéticas e Nucleares (Brazil) . . . . . [7832-13]

11.20: **Analysis of cloud-aerosol interaction with a multiple-wavelength Raman-elastic Lidar observation**, Yonghua Wu, Lina Cordero, Chuen-meei Gan, Barry Gross, Fred Moshary, Samir Ahmed, The City College of New York (United States) . . . . . [7832-14]

11.40: **Integration of remote lidar and in-situ measured data to estimate particulate flux and emission from tillage operations**, Vladimir V. Zavyalov, Gail E. Bingham, Michael D. Wojcik, Randal S. Martin, Christian Marchant, Kori D. Moore, Bill Bradford, Utah State Univ. (United States) . . . . . [7832-15]

12.00: **Lidar observation campaign of sugar cane fires and industrial emissions in the State of Sao Paulo, Brazil**, Eduardo Landulfo, Instituto de Pesquisas Energéticas e Nucleares (Brazil); Maria Paulete M. P. Jorge, Instituto de Pesquisas Energéticas e Nucleares (Brazil) and Ctr. de Previsão de Tempo e Estudos Climáticos (Brazil); Gerhard Held, Univ. Estadual Paulista Júlio de Mesquita Filho (Brazil); Roberto Guardani, Juliana Steffens, Escola Politécnica da Univ. de São Paulo (Brazil); Sergio dos Anjos Ferreira Pinto, Iara Regina N. Andre, Gilberto Garcia, Univ. Estadual Paulista - Rio Claro (Brazil); Fábio Juliano da Silva Lopes, Glauber Mariano, Renata F. da Costa, Instituto de Pesquisas Energéticas e Nucleares (Brazil) . . . . . [7832-16]

Lunch/Exhibition Break . . . . . 12.20 to 13.50

SESSION JS1

Room: Argos . . . . . Tues. 13.50 to 17.30

Joint Session: Lidar Measurements during Recent 2010 Eyjafjallajökull Volcanic Eruption

Session Chairs: **Upendra N. Singh,** NASA Langley Research Ctr. (USA); **Adolfo Comeron,** Univ. Politècnica de Catalunya (Spain); **Klaus Schäfer,** Karlsruher Institut für Technologie (Germany)

Joint Session with Conference 7827, Remote Sensing of Clouds and the Atmosphere

13.50: **EARLINET observations of the Eyjafjallajökull ash plume over Europe** *(Invited Paper)*, Gelsomina Pappalardo, Aldo Amodeo, Consiglio Nazionale delle Ricerche (Italy); Albert Ansmann, Leibniz Institut für Troposphärenforschung (Germany); Arnoud Apituley, Rijksinstituut voor Volksgezondheid en Milieu (Netherlands); Lucas Alados-Arboledas, Univ. de Granada (Spain); Dimitris S. Balis, Aristotle Univ. of Thessaloniki (Greece); Christine Böckmann, Univ. Potsdam (Germany); Anatoli Chaikovsky, Institute of Physics (Belarus); Adolfo Comeron, Univ. Politècnica de Catalunya (Spain); Giuseppe D'Amico, Consiglio Nazionale delle Ricerche (Italy); Volker Freudenthaler, Ludwig-Maximilians-Univ. München (Germany); Ivan V. Grigorov, Institute of Electronics (Bulgaria); Ove K. Gustafsson, Swedish Defence Research Agency (Sweden); Stefan Kinne, Holger Linne, Max-Planck-Institut für Meteorologie (Germany); Fabio Madonna, Consiglio Nazionale delle Ricerche (Italy); Ina Mattis, Leibniz Institut für Troposphärenforschung (Germany); Lucia Mona, Consiglio Nazionale delle Ricerche (Italy); Detlef Müller, Leibniz Institut für Troposphärenforschung (Germany); Valentin Mitev, Observatoire Cantonal de Neuchâtel (Switzerland); Doina N. Nicolae, National Institute of Research & Development for Optoelectronics (Romania); Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Maria Rita Perrone, Univ degli Studi di Lecce (Italy); Aleksander Pietruczuk, Institute of Geophysics (Poland); Manuel Pujadas, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Je . . . . . [7832-17]

14.20: **Eyjafjallajökull volcano ash plume detection in the frame of the new constituting Lidar network Leonet**, Simone Lolli, Leosphere France (France); Sebastien Conil, Andra (France); Alain Dabas, Meteo France (France); Dave Donovan, KNMI (Netherlands); Sven-Erik Gryning, Torben Mikkelsen, Risø (Denmark); Hugo Ricketts, University of Manchester (United Kingdom); Laurent Sauvage, Leosphere France (France); Geraint Vaughan, University of Manchester (United Kingdom); Joerg Walter, University Leipzig (Germany); Frank Wienhold, ETHZ (Switzerland) . . . . . [7832-18]

14.40: **Lidar observations of the Eyjafjallajökull volcanic ash plume at Leipzig, Germany**, Matthias Tesche, Albert Ansmann, Anja Hiebsch, Ina Mattis, Jörg Schmidt, Patric Seifert, Ulla Wandinger, Leibniz Institute for Tropospheric Research (Germany) . . . . . [7832-19]

15.00: **Characterization of the Eyjafjallajökull ash-plume by means of Lidar measurements over the Munich EARLINET-site**, Silke Gross, Volker Freudenthaler, Josef Gasteiger, Franziska Schnell, Matthias Wiegner, Ludwig-Maximilians-Univ. München (Germany) . . . . . [7832-20]

Coffee Break . . . . . 15.20 to 15.50

15.50: **Mix of volcanic ash and Saharan dust over Romania during Eyjafjallajokull eruption**, Doina N. Nicolae, Anca V. Nemuc, Livio Belegante, National Institute of Research & Development for Optoelectronics (Romania) . . . . . [7832-21]

16.10: **EARLINET observations of the Eyjafjallajökull ash plume over Greece**, Dimitris S. Balis, Elina Giannakaki, Aristotle Univ. of Thessaloniki (Greece); Rodanthi Elizabeth Mamouri, Panayiotis Kokkalis, Alexandros Papayannis, Giorgos Tsaknakis, ... [7832-22]

16.30: **Airborne measurements of the Eyjafjallajökull volcanic ash plume over north-western part of Germany by means of an optical particle counter and a passive mini-DOAS remote sensing system mounted on a light sport aircraft**, Konradin Weber, Christian Fischer, Günther Van Haren, Tobias Pohl, Andreas Vogel, Univ. of Applied Sciences Düsseldorf (Germany) . . . . . [7832-23]

16.50: **Optical properties characterization of Iceland volcanic particles by UV polarization Lidar at Lyon, SW Europe**, Alain Miffre, Gregory David, Benjamin Thomas, Univ. Claude Bernard Lyon 1/CNRS (France); Patrick Rairoux, Univ. Claude Bernard Lyon 1/CNRS (Germany) . . . . . [7832-24]

17.10: **Temporal and spatial structure of a volcanic ash cloud - ground-based remote sensing and numerical modeling,** Klaus Schäfer, Stefan M. Emeis, Wolfgang Junkermann, Peter Suppan, Karlsruher Institut für Technologie (Germany); Wolfgang Fricke, Harald Flentje, Werner Thomas, Stefan Gilge, Deutscher Wetterdienst (Germany); Ludwig Ries, Frank Meinhard, Umweltbundesamt (Germany); Matthias Wiegner, Volker Freudenthaler, Silke Gross, Ludwig-Maximilians-Univ. München (Germany); Christoph Münkel, Vaisala GmbH (Germany); Josef Cyrys, Anette Peters, Michael Pitz, Jürgen Schnelle-Kreis, Helmholtz Zentrum München GmbH (Germany); Hendrik Elbern, Rhenish Institute of Environmental Research (Germany); Bernhard Vogel, Karlsruher Institut für Technologie (Germany) . . . . . [7832-25]

Posters—Tuesday

Room: Concorde 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

The application of Dropsonde in typhoon detection of Chinese South Sea, Qunshan Li, Xuchang Meteorological Bureau (China) . . . . . [7832-26]

Research on the nonlinearity correction method for the piezoelectric optical scanner in a Lidar system, Xin Wu, Sihai Chen, Xiaogang Xiong, Benyi Shi, Wei Chen, Huazhong Univ. of Science and Technology (China) . . . . . [7832-34]

Raman water vapor lidar calibration: second phase, Eduardo Landulfo, Renata F. da Costa, Fabio J. S. Lopes, Instituto de Pesquisas Energéticas e Nucleares (Brazil); David N. Whiteman, NASA Goddard Space Flight Ctr. (United States); Demetrius D. Venable, Howard Univ. (United States) . . . . . [7832-29]

Scanning mobile Lidar for aerosol tracking and biological aerosol identification, Tingyao He, Fei Gao, Samo Stanic, Darko Veberic, Klemen Bergant, University of Nova Gorica (Slovenia); Ales Dolzan, Optotek (Slovenia); Xiaoquan Song, Ocean University of China (China) . . [7832-30]

The study of atmospheric correction of satellite remotely sensed images intended for air pollution using an integrated use of sunphotometers (AERONET) and Lidar system in Lemesos, Cyprus, Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Cyprus Univ. of Technology (Cyprus) . . . . . [7832-31]

Trans-boundary pollution studies by Lidar measurements around New Delhi region, India., Simone Lolli, Benjamin Guinot, Laurent Sauvage, Sophie Loaec, Leosphere France (France) . . . . . [7832-32]

PBL monitoring by means of two laser radar systems: experimental results and comparison, Carlo Bellecci, Pasquale Gaudio, Michela Gelfusa, Camilla Serafini, Andrea Malizia, Piergiorgio Ventura, Univ. degli Studi di Roma Tor Vergata (Italy). . . . . [7832-33]

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SPIE Security+Defence

Conferences: 20-23 September 2010
Exhibition: 21-22 September 2010

Centre de Congrès Pierre Baudis
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Monday-Wednesday 20-22 September 2010 • Proceedings of SPIE Vol. 7833

Unmanned/Unattended Sensors and Sensor Networks

Conference Chair: **Edward M. Carapezza,** DARPA and Univ. of Connecticut (USA)

Programme Committee: **James S. Albus,** National Institute of Standards and Technology (USA); **Mehdi Anwar,** Univ. of Connecticut (USA); **Mark Campbell,** Cornell University (USA); **Pierre Corriveau,** Naval Undersea Warfare Ctr. (USA); **Sachi V. Desai,** U.S. Army Armament Research, Development and Engineering Ctr. (USA); **John Dolan,** Carnegie Mellon Univ. (USA); **Grant R. Gerhart,** U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (USA); **Todd M. Hintz,** Space and Naval Warfare Systems Command (USA); **Myron E. Hohil,** US Army RDECOM (USA); **Ivan Kadar,** Interlink Systems Sciences, Inc. (USA); **Leslie C Laycock,** BAE Systems (United Kingdom); **Tariq Manzur,** Naval Undersea Warfare Ctr. (USA); **George McNamara,** Naval Undersea Warfare Ctr. (USA); **Nino Srour,** U.S. Army Research Lab. (USA); **Huub A.J.M. van Hoof,** TNO Defence, Security and Safety (Netherlands)

Monday 20 September

Opening Remarks
Room: Guillaumet 1. . . . . Mon. 08.30 to 08.40

Edward M. Carapezza, DARPA and Univ. of Connecticut

SESSION 1
Room: Guillaumet 1. . . . . Mon. 08.40 to 10.00

Target Detection and Tracking

Session Chairs: **Myron E. Hohil,** US Army RDECOM (USA); **George McNamara,** Naval Undersea Warfare Ctr. (USA)

08.40: **Mapping AIS coverage for trusted surveillance**, Anna-Liesa S. Lapinski, Anthony W. Isenor, Defence Research and Development Canada (Canada) . . . . . [7833-01]

09.00: **Infrared animal modeling for training ATR algorithms**, Tommy Johansson, Jan Fagerström, Mikael Karlsson, Anna Linderhed, Andreas Persson, Swedish Defence Research Agency (Sweden) . . . . . [7833-02]

09.20: **Track labeled multiple target tracking using symmetrical measurements**, Shovan Bhaumik, Swati -, Kumar Shiladitya, Indian Institute of Technology Patna (India). . . . . [7833-03]

09.40: **Multi-target multi-sensor localization and tracking using passive antenna and optical sensors on UAVs**, Marek Schikora, Fraunhofer FKIE (Germany) and Technische Univ. München (Germany); Daniel Bender, Wolfgang Koch, Fraunhofer FKIE (Germany); Daniel Cremers, Technische Univ. München (Germany) . . . . . [7833-04]

Coffee Break . . . . . 10.00 to 10.30

SESSION 2
Room: Guillaumet 1. . . . . Mon. 10.30 to 12.10

Novel Technologies

Session Chairs: **Myron E. Hohil,** US Army RDECOM (USA); **George McNamara,** Naval Undersea Warfare Ctr. (USA)

10.30: **Fabrication of a mechanically aligned single-wafer MEMS turbine with turbocharger**, Stefan O. Pelekies, Thomas G. Schuhmann, Jr., William G. Gardner, Jonathan M. Protz, Duke Univ. (United States) . . . . . [7833-05]

10.50: **A beta detecting microdevice and analysis system fabricated using conductive polymer and aluminum thin-film sensors on glass**, Adam P. Hellmers, Louisiana Tech Univ. (United States); Heath A. Berry, Radiance Technologies, Inc. (United States); Chester G. Wilson, Louisiana Tech Univ. (United States). . . . . [7833-06]

11.10: **Progress in novel mid-IR fibres and sources for chemical sensing**, Animesh Jha, Billy Richards, Vincenzo Scarnera, University of Leeds (United Kingdom); Xin Jiang, Univ. of Leeds (United Kingdom); Tariq Manzur, Naval Undersea Warfare Ctr. (United States) . . . . . [7833-07]

11.30: **Design and integration of a compact common miniature environment-insensitive navigation module for unmanned vehicles**, Mei Li, Chinese Academy of Engineering Physics (China); Gang Dai, Tsinghua Univ. (China) and Chinese Academy of Engineering Physics (China); Wei Su, Chinese Academy of Engineering Physics (China) . . . . . [7833-08]

11.50: **A new acceleration switch based on separated mass component and elastic component**, Liping Wu, Jun Hu, Bo Yang, Yang Gao, Gang Peng, Chinese Academy of Engineering Physics (China) . . . . . [7833-09]

Lunch Break . . . . . 12.10 to 13.40

SESSION 3
Room: Guillaumet 1. . . . . Mon. 13.40 to 14.40

Advanced Free-Space Optical Communication

Session Chairs: **Leslie Laycock,** BAE Systems (United Kingdom); **Tariq Manzur,** Naval Undersea Warfare Ctr. (USA)

13.40: **Optical rangefinding applications using communications modulation technique**, William D. Caplan, NIRCM (Netherlands)[7833-10]

14.00: **Body-worn optical wireless link to helmet mounted display**, David W. Charlton, Malcolm A. Watson, Henry J. White, BAE Systems (United Kingdom). . . . . [7833-11]

14.20: **Development of a small aperture bimorph deformable mirror for a free-space optical communications system**, Michael S. Griffith, Christophe A. P. Boulet, Leslie Laycock, Andrew G. McCarthy, BAE Systems (United Kingdom) . . . . . [7833-12]

Coffee Break . . . . . 14.40 to 15.30

Security+Defence Europe 2010: Plenary Session

Monday 20 September, 15.30 to 17.15 hrs

For details see page 6

Tuesday 21 September

Keynote Session 1: Unmanned Systems Technologies I
Room: Guillaumet 1 . . . . . Tues. 08.30 to 09.50

Session Chairs: **Mark Campbell,** Cornell Univ. (USA); **John M. Dolan,** Carnegie Mellon Univ. (USA)

08.30: **Distributed, collaborative human-robotic networks for outdoor experiments in search, identify and track** *(Keynote Presentation),* Mark Campbell, Cornell Univ. (United States) .[7833-14]

09.10: **Planning and learning in information space** *(Keynote Presentation),* Nicholas Roy, Massachusetts Institute of Technology (United States). . . . . [7833-15]

SESSION 4
Room: Guillaumet 1. . . . . Tues. 09.50 to 10.30

Unmanned Systems Technologies I

Session Chairs: **Mark Campbell,** Cornell Univ. (USA); **John M. Dolan,** Carnegie Mellon Univ. (USA)

09.50: **Simulation of a dead reckoning (DR) embedded system security patrol robot for deployment inside structures and buildings**, Andrew J. Tickle, Univ. of Liverpool (United Kingdom); Yan Meng, Stevens Institute of Technology (United States); Jeremy S. Smith, Univ. of Liverpool (United Kingdom). . . . . [7833-16]

10.10: **Discrete and continuous, probabilistic anticipation for autonomous robots in urban environments**, Frank Havlak, Jason Hardy, Mark Campbell, Cornell Univ. (United States). . . . . [7833-17]

Coffee Break . . . . . 10.30 to 11.00

SESSION 5
Room: Guillaumet 1. . . . . Tues. 11.00 to 12.20

Unmanned Systems Technologies II
Session Chairs: **Myron E. Hohil,** US Army RDECOM (USA); **George McNamara,** Naval Undersea Warfare Ctr. (USA)

11.00: **An unattended, unmanned, and man-portable ground sensor for wide area persistent surveillance**, David Tahmoush, U.S. Army Research Lab. (United States). . . . . [7833-18]

11.20: **Development and modeling of a stereo vision focusing system for a field programmable gate array (FPGA) based platform**, Andrew J. Tickle, Univ. of Liverpool (United Kingdom); James R. Buckle, Univ. of Glasgow (United Kingdom); Josef E. Grindley, Jeremy S. Smith, Univ. of Liverpool (United Kingdom). . . . . [7833-20]

11.40: **Using optoelectronic sensors in the system PROTEUS**, Marek Zyczkowski, Mieczyslaw Szustakowski, Wieslaw Ciurapinski, Marek Piszczek, Military Univ. of Technology (Poland) . . . . . [7833-21]

12.00: **Sustainable miniature Unmanned Undersea Vehicle (UUV) concept for remote surveillance in coastal marine environments**, Edward M. Carapezza, Defense Advanced Research Projects Agency (United States); Aldo Bargnesi, Naval Undersea Warfare Ctr. (United States) . . . . . [7833-22]

Lunch/Exhibition Break . . . . . 12.20 to 14.00

Keynote Session 2: Unmanned Systems Technologies II
Room: Guillaumet 1. . . . . Tues. 14.00 to 14.40

Session Chairs: **Mark Campbell,** Cornell Univ. (USA); **John M. Dolan,** Carnegie Mellon Univ. (USA)

14.00: **Autonomous driving research at the GM-CMU Collaborative Research Lab** *(Keynote Presentation),* John M. Dolan, Carnegie Mellon Univ. (United States) . . . . . [7833-23]

SESSION 6
Room: Guillaumet 1. . . . . Tues. 14.40 to 15.20

Unmanned Systems Technologies III
Session Chairs: **Mark Campbell,** Cornell Univ. (USA); **John M. Dolan,** Carnegie Mellon Univ. (USA)

14.40: **Video analytics for airborne platforms**, Abhijit Mahalanobis, Lockheed Martin Missiles and Fire Control (United States) . . . . . [7833-25]

15.00: **New positioning algorithm for reconfigurable mobile vehicles**, George Dekoulis, Lancaster Univ. (United Kingdom) . . . . . [7833-28]

Coffee Break . . . . . 15.20 to 15.50

SESSION 7
Room: Guillaumet 1. . . . . Tues. 15.50 to 16.30

Unmanned Systems Technologies IV
Session Chairs: **Mark Campbell,** Cornell Univ. (USA); **John M. Dolan,** Carnegie Mellon Univ. (USA)

15.50: **Computationally efficient navigation strategies for unmanned defense systems**, George Dekoulis, Lancaster Univ. (United Kingdom) . . . . . [7833-29]

16.10: **Purely optical navigation with model-based state prediction**, Alexander Sendobry, Thorsten Graber, Technische Univ. Darmstadt (Germany) . . . . . [7833-30]

Wednesday 22 September

SESSION 8
Room: Guillaumet 1. . . . . Wed. 08.00 to 10.00

Active & Passive Imagers, Image Sensing and Processing
Session Chairs: **Sachi V. Desai,** U.S. Army Armament Research, Development and Engineering Ctr. (USA); **Tariq Manzur,** Naval Undersea Warfare Ctr. (USA)

08.00: **Image Processing Algorithm for Integrated Sense And Avoid Systems**, Lidia Forlenza, Giancarmine Fasano, Domenico Accardo, Antonio Moccia, Univ. degli Studi di Napoli Federico II (Italy); Attilio Rispoli, Ctr. Italiano Ricerche Aerospaziali (Italy) . . . . . [7833-31]

08.20: **Situational adapting system supporting team situation awareness**, Tove Helldin, Univ. of Skövde (Sweden); Tina Erlandsson, Saab AB (Sweden); Lars Niklasson, Göran Falkman, Univ. of Skövde (Sweden) . . . . . [7833-32]

08.40: **Imbalanced learning for military pattern recognition**, Haibo He, The Univ. of Rhode Island (United States) and Stevens Institute of Technology (United States); Sheng Chen, Hong Man, Stevens Institute of Technology (United States); Sachi V. Desai, Shafik A. Quoraishee, U.S. Army Armament Research, Development and Engineering Ctr. (United States) . . . . . [7833-33]

09.00: **Uncooled MWIR photodetector depend on gallium concentration of laser-doped silicon carbide**, Geunsik Lim, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Tariq Manzur, Naval Undersea Warfare Ctr. (United States); Aravinda Kar, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States) . . . . . [7833-34]

09.20: **Nanostructure based EO/IR focal plane arrays for unattended ground sensor applications**, Ashok K. Sood, Magnolia Optical Technologies, Inc. (United States); Yash R. Puri, Magnolia Optical Technologies Inc. (United States); Robert A. Richwine, Magnolia Optical Technologies, Inc. (United States); Tariq Manzur, Naval Underwater Warfare Ctr. (United States); A. F. Mehdi Anwar, Univ. of Connecticut (United States); Nibir K. Dhar, DARPA (United States); Priyalal S. Wijewarnasuriya, U.S. Army Research Lab. (United States) . . . . . [7833-35]

09.40: **Applications of morphological scene change detection (MSCD) for visual leak and failure identification in process and chemical engineering**, Andrew J. Tickle, Jeremy S. Smith, Univ. of Liverpool (United Kingdom). . . . . [7833-36]

Coffee Break . . . . . 10.00 to 10.20

SESSION 9
Room: Guillaumet 1. . . . . Wed. 10.20 to 11.20

Force Protection and Security
Session Chairs: **Sachi V. Desai,** U.S. Army Armament Research, Development and Engineering Ctr. (USA); **Tariq Manzur,** Naval Undersea Warfare Ctr. (USA)

10.20: **Integrated muzzle reference sensor with compensating reticle**, Slobodan Rajic, Panos G. C. Datskos, William R. Lawrence, Oak Ridge National Lab. (United States). . . . . [7833-43]

10.40: **Mach-Zehnder fiber interferometer for people monitoring**, Vladimir Vasinek, Petr Siska, Jan Latal, Petr Koudelka, Frantisek Hanacek, Jan Skapa, Jan Vitasek, Technical Univ. of Ostrava (Czech Republic) . . . . . [7833-37]

11.00: **Room temperature GaN-based THz quantum cascade lasers for manned and unmanned applications**, Tariq Manzur, ; Mehdi Anwar, Univ. of Connecticut (United States) . . . . . [7833-38]

SESSION 10

Room: Guillaumet 1. . . . . .Wed. 11.20 to 12.40

Sensor Network and Communication

Wednesday-Thursday 22-23 September 2010 • Proceedings of SPIE Vol. 7834

Electro-Optical and Infrared Systems: Technology and Applications

Conference Chairs: **David A. Huckridge,** QinetiQ Ltd. (United Kingdom); **Reinhard R. Ebert,** Fraunhofer FOM (Germany)

Programme Committee: **Christopher Alexay,** StingRay Optics, LLC (USA); **Jan Yngve Andersson,** Acreo AB (Sweden); **Rainer Breiter,** AIM Infrarot-Module GmbH (Germany); **Gordon A. Cain,** Vision4ce Ltd. (United Kingdom); **David J. Clarke,** SELEX GALILEO (United Kingdom); **Stefania De Vito,** SELEX GALILEO (Italy); **Gérard L. Destéfanis,** CEA LETI Minatec (France); **Jean-Claude L. Fontanella,** Thales Optronique S.A. (France); **Natan S. Kopeika,** Ben-Gurion Univ. of the Negev (Israel); **José Manuel López-Alonso,** Univ. Complutense de Madrid (Spain); **John F. Parsons,** Thales Optronics Ltd. (United Kingdom); **Stanley R. Rotman,** Ben-Gurion Univ. of the Negev (Israel); **Armin Schneider,** French-German Research Institute of Saint-Louis (Germany); **Christopher W. Slinger,** QinetiQ Ltd. (United Kingdom); **Johan C. van den Heuvel,** TNO Defence, Security and Safety (Netherlands)

Tuesday 21 September

Posters—Tuesday

Room: Ariane 2 . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

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Fast uncooled module 32×32 array of polycrystalline PbSe used for muzzle flash detection, Mariusz Kastek, Rafal Dulski, Tomasz Sosnowski, Henryk Madura, Piotr Trzaskawka, Grzegorz Bieszczad, Military Univ. of Technology (Poland) . . . . . [7834-37]

Collection of photogenerated charge carriers in small-pitched infrared photovoltaic focal plane arrays, Mikhail S. Nikitin, Galina V. Chekanova, Alpha (Russian Federation); Albina A. Drugova, Viacheslav A. Kholodnov, Institute of Radio Engineering and Electronics (Russian Federation) . . . . . [7834-38]

Comparison between the "grey body emissivity" and "Bayesian inference" methods to retrieve temperature and emissivity from FTIR spectroradiometer measurements, Patricia Rosales, Carmen Blanco, Mónica Flores, Rosario Pareja, Arturo Revuelta, Fernando Marquez, Ctr. de Investigación y Desarrollo de la Armada (Spain) . . . . . [7834-39]

Adaptive multispectral image fusion for assisting drivers, Jaroslav Rehacek, Bohumil Stoklasa, Zdenek Hradil, Palacky Univ. Olomouc (Czech Republic); Radek Celechovsky, Pramacom-Ht, Spol. S R.O. (Czech Republic) . . . . . [7834-40]

Study on the precision of infrared focal panel arrays nonuniformity correction, Huiming Qu, Qian Chen, Nanjing Univ. of Science & Technology (China) . . . . . [7834-41]

Concept of electro-optical sensor module for sniper detection system, Piotr Trzaskawka, Rafal Dulski, Mariusz Kastek, Military Univ. of Technology (Poland) . . . . . [7834-42]

Enhancing image quality produced by IR cameras, Rafał Dulski, Tomasz Sosnowski, Mariusz Kastek, Piotr Trzaskawka, Military Univ. of Technology (Poland) . . . . . [7834-43]

Infrared uncooled cameras used in multi-sensor systems for perimeter protection, Rafal Dulski, Mieczyslaw Szustakowski, Mariusz Kastek, Wieslaw M. Ciurapinski, Piotr Trzaskawka, Marek Zyczkowski, Military Univ. of Technology (Poland) . . . . . [7834-44]

An operation speed enhancement in a multi-frame super resolution algorithm using a CUDA method, Mijeong Kim, Korea Research Institute of Bioscience and Biotechnology (Korea, Republic of) . . . . . [7834-45]

Wednesday 22 September

Opening Remarks

Room: Ariane 2 . . . . . Wed. 08.30 to 08.40

David A. Huckridge, QinetiQ Ltd. (United Kingdom);
Reinhard R. Ebert, Fraunhofer FOM (Germany)

SESSION 1

Room: Ariane 2 . . . . . Wed. 08.40 to 11.50

Sensor and Component Technologies

Session Chairs: **Reinhard R. Ebert,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **David Huckridge,** QinetiQ Ltd. (United Kingdom)

08.40: **Thermal imaging system using optimised wavefront coding operating in real-time**, Ian D. Hasler, Nicholas K. Bustin, David Price, Qioptiq Ltd. (United Kingdom). . . . . [7834-01]

09.00: **Real-time assessment of a linear pyroelectric array for sensor classification**, Eddie L. Jacobs, Jeremy B. Brown, Srikant K. Chari, The Univ. of Memphis (United States) . . . . . [7834-02]

09.20: **Sensor protection against laser dazzling**, Gunnar Ritt, Bernd Eberle, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [7834-03]

09.40: **Dynamic filters: passive solutions for increasing dynamic range of a camera**, Ariela Donval, Tali Fisher, Gil Blecher, Moshe Oron, KiloLambda Technologies, Ltd. (Israel) . . . . . [7834-04]

10.00: **Uncooled IR video engine for 17µm VOx µ bolometer: a modular open architecture approach**, Rotem Gazit, Adi Aharon, Marcel Katz, Igal Kogan, Igal Lerman, Udi Mizrahi, Ilan Vaserman, Asaf Amsterdam, SCD Semiconductor Devices (Israel) . . . . . [7834-05]

Coffee Break . . . . . 10.20 to 10.50

10.50: **Cryocoolers developments at Thales Cryogenics enabling compact remote sensing**, Tonny Benschop, Jeroen C. Mullie, Willem v. d. Groep, Daniel Willems, Thales Cryogenics B.V. (Netherlands); Jean-Yves Martin, Thales Cryogénie S.A. (France) . . . . . [7834-06]

11.10: **Spectral atmospheric transmittance measurements system (ATMS): performance tests and accuracy estimates**, Dario Cabib, Amir Gil, CI Systems (Israel) Ltd. (Israel) . . . . . [7834-07]

11.30: **Overview of the i-CATSI multi-pixels standoff chemical detection sensor and the MR-i imaging spectroradiometer**, Louis M. Moreau, ABB Inc. (Canada); Hugo Lavoie, Defence Research and Development Canada (Canada); Christian A. Vallieres, Florent Prel, ABB Inc. (Canada) . . . . . [7834-08]

Lunch/Exhibition Break . . . . . 11.50 to 13.20

SESSION 2

Room: Ariane 2 . . . . . Wed. 13.20 to 15.00

Sensor Modelling, Calibration, and NUC

Session Chairs: **Armin Schneider,** Technische Univ. München (Germany); **Jan Yngve Andersson,** Acreo AB (Sweden); **Johan C. van den Heuvel,** TNO Defence, Security and Safety (Netherlands)

13.20: **Desired and possible contribution of EO-systems during naval missions**, Tanja Y. C. van Valkenburg-Haarst, Wilbert L. van Norden, Koninklijke Marine (Netherlands) . . . . . [7834-09]

13.40: **Biases in the estimation of noise in thermal imagers**, Ze'ev Bomzon, CI Systems (Israel) Ltd. (Israel). . . . . [7834-10]

14.00: **Pixel-wise advanced calibration method for infrared cameras**, Philippe Lagueux, Pierre Tremblay, Martin Chamberland, André J. Villemaire, Vincent Farley, Frédérick Marcotte, Patrick Dubois, Telops (Canada) . . . . . [7834-11]

14.20: **A comparison of deghosting techniques in adaptive nonuniformity correction for IR focal-plane array systems**, Alessandro Rossi, Marco Diani, Giovanni Corsini, Univ. di Pisa (Italy) . . . . . [7834-12]

14.40: **Efficient single image non-uniformity correction algorithm**, Yohann Tendero, Ecole Normale Supérieure de Cachan (France); Jérôme Gilles, DGA-IP (France); Stéphane Landeau, Ctr. d'Expertise Parisien (France); Jean-Michel Morel, Ecole Normale Supérieure de Cachan (France) . . . . . [7834-13]

Coffee Break . . . . . 15.00 to 15.30

SESSION 3

Room: Ariane 2 . . . . . Wed. 15.30 to 16.50

Image Processing and Fusion

Session Chairs: **Christopher C. Alexay,** StingRay Optics, LLC (USA); **Rainer Breiter,** AIM INFRAROT-MODULE GmbH (Germany); **Stefania De Vito,** SELEX Galileo S.p.A. (Italy)

15.30: **Detecting suspicious objects along frequently used itineraries**, David Monnin, Armin L. Schneider, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [7834-14]

15.50: **Robust automatic detection in a maritime environment using super resolution images**, Tanja Y. C. van Valkenburg-Haarst, Krispijn A. Scholte, Koninklijke Marine (Netherlands). . . . . [7834-16]

16.10: **Adaptive fusion of visible and infrared images in dynamical scenes**, Yafeng Yin, Guang Yang, Hong Man, Stevens Institute of Technology (United States); Sachi V. Desai, U.S. Army Armament Research, Development and Engineering Ctr. (United States) . . . [7834-19]

16.30: **Extension of the SE-Workbench for the computation of aircraft infrared signatures,** Nicolas Douchin, OCTAL-SE (France) . . . . [7833-46]

Thursday 23 September

SESSION 4

Room: Ariane 2 . . . . . Thurs. 08.50 to 12.30

Detector Technology

Session Chairs: **Jean-Claude L. Fontanella,** Thales Optronique S.A. (France); **Gérard L. Destéfanis,** Commissariat à l'Énergie Atomique (France)

08.50: **A 25µm pitch LWIR staring focal plane array with pixel-level 15-bit ADC ROIC achieving 2mK NEDT** *(Invited Paper)*, Sylvette Bisotto, Eric De Borniol, Laurent R. Mollard, Fabrice Guellec, Arnaud Peizerat, Michaël Tchagaspanian, Pierre Castelein, Commissariat à l'Énergie Atomique (France); Patrick Maillart, SOFRADIR (France) . . . . . [7834-20]

09.20: **High performance uncooled amorphous silicon VGA and XGA IRFPA with 17µm pixel-pitch** *(Invited Paper)*, Jean-Luc M. Tissot, Alain Durand, Christophe Minassian, Michel Vilain, Patrick Robert, ULIS (France) . . . . . [7834-21]

09.50: **Photonic crystal wave guide for non-cryogenic cooled carbon nanotube based middle wave infrared sensors** *(Invited Paper)*, Ning Xi, Michigan State Univ. (United States). . . . . [7834-22]

Coffee Break . . . . . 10.20 to 10.50

10.50: **MCT (HgCdTe) IR detectors: latest developments in France**, Yann Reibel, SOFRADIR (France); Michel Vuillermet, Frederic Pistone, ; Jean-luc Dessus, SOFRADIR (France) . . . . . [7834-23]

11.10: **Last developments in small, low-weight and low-power IR cooled detectors**, Frédéric P. Pistone, Laurent Rubaldo, Philippe Tribolet, SOFRADIR (France). . . . . [7834-24]

11.30: **HgCdTe APD and FPA development at DEFIR**, Johan Rothman, Commissariat à l'Énergie Atomique (France) . . . . . [7834-25]

11.50: **Experimental characterization of an infrared focal plane array for flash laser radar imaging**, Eric De Borniol, Commissariat à l'Énergie Atomique (France); Fabrice Guellec, Johan Rothman, André Perez, Jean-Paul Zanatta, Pierre Castelein, Gérard L. Destéfanis, Commissariat à l'Énergie Atomique (United States); Frédéric P. Pistone, SOFRADIR (France); Jean-Christophe Peyrard, Délégation Générale pour l'Armement (France) . . . . . [7834-26]

12.10: **Design and evaluation of a quantum well based resistive far infrared bolometer**, Per S. Ericsson, Linda Höglund, Björn Samel, Susan M. Savage, Stanley G. E. Wissmar, Olof Öberg, Acreo AB (Sweden); Jan-Erik Källhammer, Dick Eriksson, Autoliv Development AB (Sweden) . . . . . [7834-27]

Lunch Break . . . . . 12.30 to 13.50

SESSION 5

Room: Ariane 2 . . . . . Thurs. 13.50 to 14.50

Detector Fabrication and Packaging

Session Chairs: **David J. Clarke,** SELEX Galileo Ltd. (United Kingdom); **John F. Parsons,** Thales Optronics Ltd. (United Kingdom); **Chris Slinger,** QinetiQ Ltd. (United Kingdom)

13.50: **Mixed-signal 0.18µm CMOS and SiGe BiCMOS foundry technologies for ROIC applications**, Arjun Kar-Roy, David Howard, Marco Racanelli, Mike Scott, Samir Chaudhry, Scott Jordan, TowerJazz (United States). . . . . [7834-28]

14.10: **Fabrication method for chip-scale-vacuum-packages based on a chip-to-wafer-process**, Jochen Bauer, Dirk Weiler, Marco Russ, Jennifer Hess, Pin Yang, Jürgen Voss, Norbert Arnold, Holger Vogt, Fraunhofer-Institut für Mikroelektronische Schaltungen und Systeme (Germany) . . . . . [7834-29]

14.30: **Recent development in pixel level packaging for uncooled IRFPA**, Wilfried Rabaud, Geoffroy Dumont, Xavier Baillin, Laurent Carle, Emmanuelle Lagoutte, Valérie Goudon, Claire Vialle, Agnès Arnaud, CEA-LETI-MINATEC (France) . . . . . [7834-30]

Coffee Break . . . . . 14.50 to 15.30

SESSION 6

Room: Ariane 2 . . . . . Thurs. 15.30 to 17.10

Active Technology and Novel Materials

Session Chairs: **Gordon A. Cain,** Vision4ce Ltd. (United Kingdom); **José Alonso Fernandez,** Univ. Complutense de Madrid (Spain)

15.30: **Mid-wave and long-wave infrared metamaterials and nanomaterials design with finite element and finite difference time domain models for target camouflage**, Alessandro Albertoni, Sergio Perfetto, BFi OPTiLAS S.A. (Italy) . . . . . [7834-32]

15.50: **Identification of small sea-surface targets with a laser range profiler**, Robin M. Schoemaker, Gijs Franssen, Koen W. Benoist, Arjan L. Mieremet, TNO Defence, Security and Safety (Netherlands) . . . . [7834-33]

16.10: **Astigmatic laser beam shaping using intentionally introduced optical aberrations**, James A. Harder, Michaelene W. Sprague, Elbit Systems of America (United States) . . . . . [7834-34]

16.30: **Infrared MEMS lasers for small-arms ammunition tracers**, John W. Sweeney, Noah P. Bergeron, Chester G. Wilson, Louisiana Tech Univ. (United States). . . . . [7834-35]

16.50: **optimization of discrete laser diode driver for imaging applications**, M. K. Sheeja, SCT College of Engineering, Trivandrum, Kerala, India (India) . . . . . [7834-36]

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Electro-Optical Remote Sensing

Wednesday 22 September

Opening Remarks
Room: Guillaumet 1. . . . . .Wed. 13.00 to 13.10

Gary W. Kamerman, FastMetrix, Inc. (USA);
Ove Steinvall, Swedish Defence Research Agency (Sweden)

SESSION 1
Room: Guillaumet 1. . . . . .Wed. 13.10 to 15.20

Laser Radar Systems I
Session Chair: **Gary W. Kamerman,** FastMetrix, Inc. (USA)

13.10: **Rapid topographic and bathymetric reconnaissance using airborne LiDAR** *(Invited Paper)*, Andreas Axelsson, Airborne Hydrography AB (Sweden) . . . . . .[7835A-01]

13.40: **Range accuracy of a gated-viewing system compared to a 3D flash LIDAR under various turbulence conditions**, Benjamin Göhler, Peter Lutzmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . .[7835A-02]

14.00: **High range resolution laser scanner with full waveform recording**, Håkan Larsson, Dietmar Letalick, Gustav Tolt, Lars Allard, Erika Jönsson, Swedish Defence Research Agency (Sweden). .[7835A-03]

14.20: **Database for chemical weapons detection: data acquired and first analysis for a multiwavelenght DIAL**, Carlo Bellecci, Pasquale Gaudio, Michela Gelfusa, Maria Richetta, Camilla Serafini, Piergiorgio Ventura, Arnaldo D'Amico, Eugenio Martinelli, Corrado Di Natale, Univ. degli Studi di Roma Tor Vergata (Italy); Arianna Antonucci, Valeria Della Rocca, Francesco Pasquaino, Alessandro Sassolini, Ctr. Tecnico Logistico Interforze NBC (Italy) . . . . . .[7835A-04]

14.40: **Stand-off detection of vapor phase explosives by resonant enhanced Raman spectroscopy**, Anneli Ehlerding, Ida Johansson, Markus Nordberg, Sara Wallin, Henric Oestmark, Swedish Defense Research Agency (Sweden) . . . . . .[7835A-05]

15.00: **A portable system for measuring the absolute geographic location of distant objects**, Lovro Kuscer, Janez Diaci, Univ. of Ljubljana (Slovenia). . . . . .[7835A-06]

Coffee Break . . . . . .15.20 to 15.50

SESSION 2
Room: Guillaumet 1. . . . . .Wed. 15.50 to 17.00

Laser Radar Modelling
Session Chair: **R. Kennedy McEwen,**
SELEX Galileo Ltd. (United Kingdom)

15.50: **Modelling of an active burst illumination imaging system: comparison between experimental and modelled 3D scene** *(Invited Paper)*, Nicolas Rivière, Guillaume Anna, Laurent Hespel, Bernard Tanguy, Marie-Thérèse Velluet, Yves-Michel Frederic, ONERA (France) .[7835A-07]

16.20: **Physical modelling of point-cloud (3D) and full-wave-form (4D) laser imaging**, Guillaume Anna, Laurent Hespel, Nicolas Rivière, Bernard Tanguy, Dominique Hamoir, ONERA (France) . . . . . .[7835A-08]

16.40: **Modeling of 1.5 µm range gated imaging for small surface vessel identification**, Richard L. Espinola, U.S. Army Night Vision & Electronic Sensors Directorate (United States); Ove Steinvall, Magnus Elmquist, Kjell Karlsson, Swedish Defence Research Agency (Sweden) . . . . . .[7835A-09]

Thursday 23 September

SESSION 3
Room: Guillaumet 1. . . . . .Thurs. 09.00 to 10.00

Laser Radar Systems II
Session Chair: **Laurent Hespel,** ONERA (France)

09.00: **Laser radar: from early history to new trends**, Vasyl Molebny, National Taras Shevchenko Univ. of Kyiv (Ukraine); Gary W. Kamerman, FastMetrix, Inc. (United States); Ove Steinvall, Swedish Defence Research Agency (Sweden). . . . . .[7835A-11]

09.20: **ACTIM: an EDA initiated study on active imaging**, Ove Steinvall, Ingmar G. Renhorn, Håkan Larsson, Lars J. Sjöqvist, Jörgen Ahlberg, Dietmar Letalick, Swedish Defence Research Agency (Sweden); Endre Repasi, Peter Lutzmann, Gregor Anstett, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Dominique Hamoir, Laurent Hespel, Yannick G. Boucher, ONERA (France) . . . . . .[7835A-12]

09.40: **Optical air temperature and density measurement system for aircraft using elastic and Raman backscatter**, Michael Fraczek, EADS Deutschland GmbH (Germany); Andreas Behrendt, Univ. Hohenheim (Germany); Nikolaus Schmitt, EADS Deutschland GmbH (Germany) . . . . . .[7835A-13]

Coffee Break . . . . . .10.00 to 10.30

SESSION 4
Room: Guillaumet 1. . . . . .Thurs. 10.30 to 12.10

Passive Electro-Optical Systems
Session Chair: **Peter N. Randall,** QinetiQ Ltd (United Kingdom)

10.30: **LOTIS facility succefully reaches initial operational capability**, Raymond M. Bell, Jr., Lockheed Martin Corp. (United States); Stephen A. Borota, Greg Cuzner, Andrew T. Cochrane, Lockheed Martin Space Systems Co. (United States) . . . . . .[7835A-14]

10.50: **Fast multispectral radiometric method and instruments for analysis of blast**, Tzachi I. Sabati, Adam D. Devir, Alexander B. Lessin, Michael Y. Engel, Yossi Bushlin, IARD Sensing Solutions Ltd. (Israel) . . . . . .[7835A-15]

11.10: **Standoff gas identification and quantification from turbulent stack plumes with an imaging Fourier-transform spectrometer**, Philippe Lagueux, Vincent Farley, Pierre Tremblay, Simon Savary, Martin Chamberland, André J. Villemaire, Telops (Canada). . . . . .[7835A-16]

11.30: **Spectral and spatial measurements of atmospheric aerosol clouds with a hyperspectral sensor**, Eyal Agassi, Eitan Hirsch, Ayala Ronen, IIBR - Israel Institute for Biological Research (Israel) . . .[7835A-17]

11.50: **Sea modelling and rendering,** Jean Latger, Thierry Cathala, OKTAL-SE (France) . . . . . .[7835A-28]

Lunch Break . . . . . .12.10 to 13.20

SESSION 5
Room: Guillaumet 1. . . . . .Thurs. 13.20 to 15.00

Signal Processing

Session Chair: **Vasyl V. Molebny,**
National Taras Shevchenko Univ. of Kyiv (Ukraine)

13.20: **FIT3D toolbox: multiple view geometry and 3D reconstruction for matlab**, Isaac Esteban, Judith Dijk, TNO Defence, Security and Safety (Netherlands); Frans C. A. Groen, Univ. van Amsterdam (Netherlands) . . . . . .[7835A-18]

13.40: **Exploiting context for assisted aerial image interpretation**, Alexander Bauer, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . .[7835A-19]

14.00: **Dealing with uncertain feature assessments in interactive object recognition**, Alexander Bauer, Verena Jürgens, Susanne Angele, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . .[7835A-20]

14.20: **Amplitude holographic LPCC filters for 4-f correlator: variants of binary realization**, Nikolay N. Evtikhiev, Evgeny Y. Zlokazov, Rostislav S. Starikov, Sergey N. Starikov, Dmitry Shaulskiy, Moscow Engineering Physics Institute (Russian Federation) . . . . . .[7835A-21]

14.40: **Extraction of the objects observed on a non-uniform background during sensor motion**, Boris A. Alpatov, Pavel V. Babayan, Ryazan State Radio Technical Univ. (Russian Federation) . . . . .[7835A-22]

Coffee Break . . . . . .15.00 to 15.20

SESSION 6
Room: Guillaumet 1. . . . . .Thurs. 15.20 to 17.00

Photonic Components and Architectures in Defence Systems

Session Chair: **Keith L. Lewis,** Sciovis Ltd. (United Kingdom)

15.20: **Revival of infrared circular variable filters: new design and applications**, Dario Cabib, CI Systems (Israel) Ltd. (Israel) . . . .[7835A-23]

15.40: **A technique for flicker reduction in a volumetric three-dimensional display with a static image space**, James J. Sluss, Jr., Badia Koudsi, The Univ. of Oklahoma - Tulsa (United States); Hakki H. Refai, 3DIcon Corp. (United States) . . . . . .[7835A-24]

16.00: **Progress of laser diode arrays operating under harsh conditions**, Andreas Kohl, Thierry Fillardet, Herve Moisan, Eric Brousse, Quantel Group (France). . . . . .[7835A-25]

16.40: **The manufacturing and testing of Cs_2Te UV image intensifier**, Rongguo Fu, Nanjing Univ. of Science & Technology (China) . .[7835A-27]

Monday 20 September 2010 • Pat of Proceedings of SPIE Vol. 7835

Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing

Conference Chairs: **Gary J. Bishop,** BAE Systems (United Kingdom); **John D. Gonglewski,** Air Force Research Lab. (USA)

Monday 20 September

Opening Remarks

Room: Argos . . . . . Mon. 09.00 to 09.10

Gary J. Bishop, BAE Systems (United Kingdom);
John D. Gonglewski, Air Force Research Lab. (USA)

SESSION 8

Room: Argos . . . . . Mon. 09.10 to 12.20

Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing

09.10: **Airborne infrared hyperspectral mapping for detection of gaseous and solid targets**, Philippe Lagueux, Vincent Farley, Frédérick Marcotte, Martin Chamberland, Telops (Canada); Eldon Puckrin, Caroline-Stéphanie Turcotte, Pierre Lahaie, Denis Dubé, Defence Research and Development Canada (Canada) . . . . . .[7835B-30]

09.30: **Detection of disturbed Earth using hyperspectral LWIR imaging Data**, Wendy A. Hubbard, BAE Systems (United Kingdom); Philippe Lagueux, Telops (Canada). . . . . .[7835B-31]

09.50: **An acousto-optic based hyperspectral imaging camera for security and defence applications**, Jon Ward, Gooch & Housego (UK) Ltd. (United Kingdom); Mark Farries, Gooch & Housego, Torquay (United Kingdom); Elliot S. Wachman, Gooch & Housego, New Jersey (United States); Chris N. Pannell, Gooch & Housego, Orlando (United States) . . . . . .[7835B-32]

10.10: **CMT SWIR-hyperspectral imaging for UAV Luna**, Ralf Scheibner, Holger Egner, Rainer Breiter, Johann Ziegler, Wolfgang A. Cabanski, AIM INFRAROT-MODULE GmbH (Germany); Markus Müller, Norbert F. Heinze, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Bernhard Obrecht, EMT Ingenieurgesellschaft (Germany) . . . . . .[7835B-33]

Coffee Break . . . . . 10.30 to 11.00

11.00: **Adaptive band selection snapshot multispectral imaging in the VIS/NIR domain**, Jean Minet, Jean Taboury, Lab. Charles Fabry (France); Michel Péalat, Nicolas Roux, Jacques Lonnoy, Sagem Defense Securite (France); Yann Ferrec, Office National d'Etudes et de Recherches Aérospatiales (France). . . . . .[7835B-34]

11.20: **Correction and use of inflight hyperspectral data**, Ainsley Killey, BAE Systems (United Kingdom) . . . . . .[7835B-35]

11.40: **Change detection from co-aligned aerial hyperspectral push-broom strips**, Niclas Wadströmer, Jörgen Ahlberg, Swedish Defence Research Agency (Sweden); Per-Erik Forssén, Erik Ringaby, Linköping Univ. (Sweden) . . . . . .[7835B-36]

12.00: **A polarization interference imaging spectrometer for exploration of remote sensing,** Hongwen Gao, Xi'an Institute of Optics and Precision Mechanics (China); Chunmin Zhang, Xi'an Jiaotong Univ. (China) . . . . . .[7835B-37]

Security+Defence Europe 2010: Plenary Session

Monday 20 September, 15.30 to 17.15 hrs

For details see page 6

Wednesday-Thursday 22-23 September 2010 • Proceedings of SPIE Vol. 7836

Technologies for Optical Countermeasures

Conference Chairs: **David H. Titterton,** Defence Science and Technology Lab. (United Kingdom); **Mark A. Richardson,** Cranfield Univ. (United Kingdom)

Programme Committee: **Brian Butters,** Chemring Countermeasures (United Kingdom); **Marc Eichhorn,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Ian F. Elder,** SELEX GALILEO (United Kingdom); **Anton Kohnle,** Fraunhofer FOM (Germany); **Stephen P. McGeoch,** Thales Optronics Ltd. (United Kingdom); **Benoit Mellier,** DGA/DCE/CELAR (France); **Espen Lippert,** Norwegian Defense Research Establishment (Norway); **Ric H. M. A. Schleijpen,** TNO Defence, Security and Safety (Netherlands); **Ove Steinvall,** Swedish Defence Research Agency (Sweden); **Mark R.G. Taylor,** Defence Science and Technology Organisation (Australia); **Jonny Terry,** Univ. of St. Andrews (United Kingdom); **Hans Dieter Tholl,** Diehl BGT Defence GmbH & Co. KG (Germany)

Tuesday 21 September

Posters—Tuesday
Room: Guillaumet 2. . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Countermeasurements of RAM targets, Karsten Diener, Institut Franco-Allemand de Recherches de Saint-Louis (France); Rudolf Protz, MBDA Germany (Germany) . . . . . [7836-19]

Wednesday 22 September

Opening Remarks
Room: Guillaumet 2. . . . . .Wed. 08.50 to 09.00

David H. Titterton, Defence Science and Technology Lab. (United Kingdom); **Mark A. Richardson,** Cranfield Univ. (United Kingdom)

Keynote Session
Room: Guillaumet 2. . . . . .Wed. 09.00 to 11.30

Session Chairs: **David H. Titterton,** Defence Science and Technology Lab. (United Kingdom); **Mark A. Richardson,** Cranfield Univ. (United Kingdom)

09.00: **Recent developments of HEL programmes** *(Keynote Presentation)*, Harro Ackermann, High Energy Laser Joint Technology Office (United States) . . . . . [7836-01]

09.40: **QCL technologies for countermeasurements and sensing** *(Keynote Presentation),* Erwan L. Normand, Cascade Technologies Ltd. (United Kingdom) . . . . . [7836-02]

Coffee Break . . . . . .10.20 to 10.50

10.50: **Sources are the foundation of IRCM** *(Keynote Presentation),* Robert J. Grasso, Northrop Grumman Electronic Systems (United States). . . . . [7836-03]

SESSION 1
Room: Guillaumet 2. . . . . .Wed. 11.30 to 12.40

Countermeasure Sources I

Session Chair: **Marc Eichhorn,** Institut Franco-Allemand de Recherches de Saint-Louis (France)

11.30: **Performance requirements for countermeasures lasers** *(Invited Paper)*, Ian Elder, Selex Galileo (United Kingdom) . . . . . .[7836-04]

12.00: **Compact fiber laser-pumped mid-infrared source based on orientation-patterned gallium arsenide**, Arnaud Grisard, François Gutty, Eric Lallier, Thales Research & Technology (France); Bruno P. Gerard, Alcatel-Thales III-V Lab. (France) . . . . . .[7836-05]

12.20: **OP-GaAs OPO pumped by 2µm Q-switched lasers: Tm;Ho:silica fiber laser and Ho:YAG laser**, Christelle Kieleck, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France); David Faye, Eric Lallier, Bruno P. Gerard, Thales Research & Technology (France); Stuart D. Jackson, The Univ. of Sydney (Australia) . . . . . .[7836-06]

Lunch/Exhibition Break . . . . . .12.40 to 14.00

SESSION 2
Room: Guillaumet 2. . . . . .Wed. 14.00 to 15.10

Countermeasure Sources II

Session Chair: **Ian F. Elder,** SELEX Galileo Ltd. (United Kingdom)

14.00: **Thermal effects and upconversion in the Er3+:YAG solid-state heat-capacity laser** *(Invited Paper)*, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . .[7836-07]

14.30: **High-pulse energy Q-switched Tm^{3+}:YAG laser for nonlinear frequency conversion to the mid-IR**, Georg Stöppler, Christelle Kieleck, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . .[7836-08]

14.50: **Q-swicthed Er:YAG laser with crystalline fibre geometry**, Stefano Bigotta, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . .[7836-09]

Coffee Break . . . . . .15.10 to 15.40

SESSION 3
Room: Guillaumet 2. . . . . .Wed. 15.40 to 17.10

Countermeasure Sources III

Session Chair: **Tim C. Newell,** Air Force Research Lab. (USA)

15.40: **Pulsed 2 µm fiber lasers for direct and pumping applications in defence and security** *(Invited Paper)*, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . .[7836-10]

16.10: **A compact, high power Er:Yb:glass eyesafe laser for infrared remote sensing applications**, Marco Vitiello, Andrea Pizzarulli, Andrea Ruffini, Gem Elettronica Srl (Italy) . . . . . .[7836-11]

16.30: **High power multi-wavelength infrared source**, Espen Lippert, Helge Fonnum, Gunnar Arisholm, Knut Stenersen, Norwegian Defense Research Establishment (Norway) . . . . . .[7836-12]

16.50: **Recent OPGaAs developments,** Peter Schunemann, BAE Systems (United Kingdom) . . . . . .[7836-30]

Thursday 23 September

SESSION 4
Room: Guillaumet 2. . . . . .Thurs. 08.30 to 10.00

Countermeasure Technology I

Session Chair: **Ric H. M. A. Schleijpen,** TNO Defence, Security and Safety (Netherlands)

08.30: **Toolset for evaluating infrared countermeasures and signature reduction for ships** *(Invited Paper)*, Ric H. M. A. Schleijpen, TNO Defence, Security and Safety (Netherlands) . . . . . [7836-16]

09.00: **Development of a compact frequency conversion module for airborne countermeasures**, Antoine Godard, Myriam Raybaut, Thomas Schmid, Michel Lefebvre, ONERA (France); Anne-Marie Michel, Christophe Oudart, Sergio Teixeira, Michel Péalat, Sagem Defense Securite (France) . . . . . [7836-17]

09.20: **Towards initiation of explosives utilizing ultrafast laser quantum control**, Margo Greenfield, R. Jason Scharff, Shawn D. McGrane, David S. Moore, Los Alamos National Lab. (United States) . . . . . [7836-18]

09.40: **kW-class, narrow linewidth counter pumped fiber amplifiers**, John P. Edgecumbe, Thomas Ehrenreich, Chih-Hao Wang, Kevin Farley, Josh Galipeau, Ryan Leveille, David Björk, Imtiaz Majid, Kanishka Tankala, Bryce N. Samson, Nufern (United States) . . . . . [7836-29]

Coffee Break . . . . . 10.00 to 10.30

SESSION 5
Room: Guillaumet 2. . . . . .Thurs. 10.30 to 11.30

Countermeasure Technology II

Session Chair: **Brian Butters,**
Chemring Countermeasures Ltd. (United Kingdom)

10.30: **Thermal management investigations in ceramic thin disk lasers**, Tim C. Newell, Tyler Carson, Air Force Research Lab. (United States); Natasa Vretenar, The Univ. of New Mexico (United States); William P. Latham, Air Force Research Lab. (United States). . . . . [7836-21]

10.50: **Numerical laser beam propagation using a Large Eddy Simulation refractive index field representing a jet engine exhaust**, Lars J. Sjöqvist, Markus Henriksson, Ekaterina Fedina, Christer Fureby, Swedish Defence Research Agency (Sweden) . . . . . [7836-22]

11.10: **Laser beam propagation through a full scale aircraft turboprop engine exhaust**, Markus Henriksson, Ove K. Gustafsson, Lars J. Sjöqvist, Swedish Defence Research Agency (Sweden); Dirk P. Seiffer, Norbert Wendelstein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [7836-24]

SESSION 6
Room: Guillaumet 2. . . . . .Thurs. 11.30 to 12.50

Countermeasure Modelling

Session Chair: **Benoit Mellier,** DGA/DCE/CELAR (France)

11.30: **Effect of payload size on pre-emptive flare countermeasure against Man-Portable Air-Defence (MANPAD) system**, James Jackman, Mark A. Richardson, Peter W. Yuen, David B. James, Cranfield Univ. (United Kingdom); Brian Butters, Roy H. Walmsley, Nicolas Millwood, Chemring Countermeasures Ltd. (United Kingdom). . . [7836-20]

11.50: **Effect of pre-emptive flares on Man-Portable Air-Defence (MANPAD) systems with a track angle bias counter-countermeasure (CCM)**, James Jackman, Mark A. Richardson, Peter W. Yuen, David B. James, Cranfield Univ. (United Kingdom); Brian Butters, Roy H. Walmsley, Nicolas Millwood, Chemring Countermeasures Ltd. (United Kingdom) . . . . . [7836-23]

12.10: **A theoretical investigation of stimulated Brillouin scattering in phase-modulated fiber amplifiers**, Clint Zeringue, Iyad A. Dajani, Air Force Research Lab. (United States) . . . . . [7836-25]

12.30: **Numerical Study of the Thermal Infrared Characteristics for Orbital Objects**, Fubing Li, Xiaojian Xu, BeiHang Univ. (China). . [7836-26]

Lunch Break . . . . . 12.50 to 14.00

SESSION 7
Room: Guillaumet 2. . . . . .Thurs. 14.00 to 15.50

Beam Steering and Quantum-Cascade Lasers

Session Chair: **Lars J. Sjöqvist,**
Swedish Defence Research Agency (Sweden)

14.00: **Infrared semiconductor lasers for power projection and sensing** *(Invited Paper)*, Hans D. Tholl, Diehl BGT Defence GmbH & Co. KG (Germany); Joachim Wagner, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) . . . . . [7836-13]

14.30: **Beam steering in mid-infrared emitting quantum-cascade lasers**, Frank Fuchs, Stefan Hugger, Michel Kinzer, Borislav Hinkov, Wolfgang Bronner, Rainer Lösch, Rolf Aidam, Quankui K. Yang, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); Hans D. Tholl, Diehl BGT Defence GmbH & Co. KG (Germany) . . . . . [7836-14]

14.50: **High-energy laser beam steering with periodic shock waves**, Michael McBeth, Space and Naval Warfare Systems Ctr. Atlantic (United States) . . . . . [7836-15]

15.10: **Quantum cascade lasers for defense and security applications**, Xavier Marcadet, Mathieu Carras, B. Simozrag, Michel Garcia, G. M. De Naurois, G. Maisons, Olivier Parillaud, Alcatel-Thales III-V Lab. (France). . [7836-27]

15.30: **Quantum-cascade lasers with emission wavelength 3-5 µm**, W. Ted Masselink, Humboldt-Univ. zu Berlin (Germany) . . . . . [7836-28]

Millimetre Wave and Terahertz Sensors and Technology

Conference Chairs: **Keith A. Krapels,** U.S. Army Night Vision & Electronic Sensors Directorate (USA); **Neil Anthony Salmon,** QinetiQ Ltd. (United Kingdom)

Programme Committee: **Amir Abramovich,** Ariel Univ. Ctr. of Samaria (Israel); **Nicholas J. Bowring,** Manchester Metropolitan Univ. (United Kingdom); **Markus Peichl,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Douglas T. Petkie,** Wright State Univ. (USA); **Christopher A. Schuetz,** Phase Sensitive Innovations, Inc. (USA)

Monday 20 September

Opening Remarks

Room: Diamant . . . . . Mon. 08.50 to 09.00

Keith A. Krapels, U.S. Army Night Vision & Electronic Sensors Directorate (USA); **Neil Anthony Salmon,** QinetiQ Ltd. (United Kingdom)

SESSION 1

Room: Diamant . . . . . Mon. 09.00 to 11.30

Millimetre and THz Devices

Session Chairs: **Christopher A. Schuetz,** Phase Sensitive Innovations, Inc. (USA); **Neil Anthony Salmon,** QinetiQ Ltd. (United Kingdom)

09.00: **Transient analysis of sub-micron transit length Gunn diode as high power Terahertz source**, Faisal Amir, Colin Mitchell, The Univ. of Manchester (United Kingdom); Novak Farrington, e2v technologies (UK) Ltd. (United Kingdom); Mohamed Missous, The Univ. of Manchester (United Kingdom). . . . . [7837-01]

09.20: **MMIC technology for spectroscopy applications**, Ingmar Kallfass, Axel Tessmann, Axel Huelsmann, Arnulf Leuther, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); John S. Cetnar, Douglas T. Petkie, Wright State Univ. (United States) . . . . . [7837-02]

09.40: **THz imaging with low-cost 130 nm CMOS transistors**, Franz Schuster, Commissariat à l'Énergie Atomique (France); Maciej Sakowicz, Univ. Montpellier 2 (France); Alexandre Siligaris, Laurent Dussopt, Commissariat à l'Énergie Atomique (France); Hadley Videlier, Dominique Coquillat, Frédéric Teppe, Univ. Montpellier 2 (France); Benoît Giffard, Commissariat à l'Énergie Atomique (France); Wojciech Knap, Univ. Montpellier 2 (France) . . . . . [7837-03]

Coffee Break . . . . . 10.00 to 10.30

10.30: **A MEMS fabrication approach for a 200GHz microklystron driven by a small-scaled pseudospark electron beam**, Jonathan Protz, Thomas G. Schuhmann, Jr., Duke Univ. (United States); David J. Fields, Logos Technologies, Inc. (United States); Huabi Yin, Adrian W. Cross, Wenlong He, David Bowes, Kevin Ronald, Alan D. R. Phelps, Univ. of Strathclyde (United Kingdom) . . . . . [7837-04]

10.50: **Towards a THz backward wave amplifier in European FP7 OPTHER project**, Massimiliano Dispenza, SELEX Sistemi Integrati S.p.A. (Italy); Aldo Di Carlo, Univ. degli Studi di Roma Tor Vergata (Italy); Viktor Krozer, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); Rodolphe Marchesin, Thales Electron Devices S.A. (France); Mauro Mineo, Claudio Paoloni, Univ. degli Studi di Roma Tor Vergata (Italy); Anna Maria Fiorello, Alberto Secchi, SELEX Sistemi Integrati S.p.A. (Italy); Francesca Brunetti, Univ. degli Studi di Roma Tor Vergata (Italy); Kim Pham, Thales Electron Devices S.A. (Italy); Mikko Kotiranta, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); Vitaliy Zhurbenko, Technical Univ. of Denmark (Denmark); Jean-Philippe P. Schnell, Pierre Legagneux, Daniel Dolfi, Alfredo De Rossi, Pierrick Guiset, Thales Research & Technology (France); Alain Durand, Thales Electron Devices S.A. (France); Stephan Megtert, Fayçal Bouamrane, Thomas Bouvet, Ecole Polytechnique (France); Giacomo Ulisse, Maria L. Terranova, Univ. degli Studi di Roma Tor Vergata (Italy) . . . . . [7837-05]

11.10: **SiGe BiCMOS manufacturing platform for mmWave applications**, Arjun Kar-Roy, David Howard, Edward Preisler, Marco Racanelli, Samir Chaudhry, Volker Blaschke, TowerJazz (United States) . . . . . [7837-06]

Lunch Break . . . . . 11.30 to 13.00

SESSION 2

Room: Diamant . . . . . Mon. 13.00 to 15.00

Quasi-Optical Imaging Systems

Session Chairs: **Douglas T. Petkie,** Wright State Univ. (USA); **Keith A. Krapels,** U.S. Army Night Vision & Electronic Sensors Directorate (USA)

13.00: **THz imaging using Glow Discharge Detector (GDD) focal plane arrays and large aperture quasi optic mirrors**, Natan S. Kopeika, Ben-Gurion Univ. of the Negev (Israel); Amir Abramovich, Ariel Univ. Ctr. of Samaria (Israel); Daniel Rozban, Hezi Joseph, Avihai Akram, Orly Yadid-Pecht, Alexander A. Belenky, Simon Lineykin, Ben-Gurion Univ. of the Negev (Israel). . . . . [7837-07]

13.20: **3D millimeter wave tomographic scanner for large size opaque object inspection with different refractive index contrasts**, A. Younus, CPMOH/Univ. Bordeaux/CNRS (France); S. Salort, Jean-Pascal Caumes, ALPhANOV (France); P. Desbarats, LABRI/Univ. Bordeaux/CNRS (France); Patrick Mounaix, Emmanuel Abraham, CPMOH/Univ. Bordeaux/CNRS (France) . . . . . [7837-08]

13.40: **Real-time THz active imaging: comparison test of commercial THz cameras**, Fabien Destic, Institut Supérieur de l'Aéronautique et de l'Espace (France); Jean-Pascal Caumes, ALPhANOV (France); Yoann Petitjean, Institut Supérieur de l'Aéronautique et de l'Espace (France); Jean-Claude Mollier, Institut Supérieur de l'Aéronautique et de l'Espace (France) and ONERA (France); Bruno Chassagne, ALPhANOV (France) . . . . . [7837-09]

14.00: **Development of uncooled antenna-coupled microbolometer arrays for explosive detection and identification**, François Simoens, Jerôme Meilhan, Stéphane Pocas, Pierre Imperinetti, Jérémy Lalanne-Dera, Valérie Goudon, Jean-Louis Ouvrier-Buffet, Agnès Arnaud, Pierre Castelein, Thierry Maillou, Lionel Hairault, Commissariat à l'Énergie Atomique (France); Pierre Gellié, Stefano Barbieri, Carlo Sirtori, Univ. Paris 7-Denis Diderot (France) . . . . . [7837-10]

14.20: **Fully-polarimetric passive MMW imaging systems for security applications**, Stephan Dill, Markus Peichl, Matthias Jirousek, Helmut H. S. Suess, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7837-11]

14.40: **a sub-millimeter wave line scanning imager**, Orges Furxhi, Eddie L. Jacobs, The Univ. of Memphis (United States). . . . . [7837-12]

Coffee Break . . . . . 15.00 to 15.30

Security+Defence Europe 2010: Plenary Session

Monday 20 September, 15.30 to 17.15 hrs

For details see page 6

Tuesday 21 September

SESSION 3
Room: Diamant . . . . . Tues. 09.20 to 10.20

Phenomenology and Measurements

Session Chairs: **Nicholas J. Bowring,** Manchester Metropolitan Univ. (United Kingdom); **Eddie L. Jacobs,** The Univ. of Memphis (USA)

09.20: **Polarization difference imaging for millimeter-wave in a desert environment**, John P. Wilson, Univ. of Delaware (United States); Christopher A. Schuetz, Phase Sensitive Innovations, Inc. (United States); Edwin L. Stein, Jr., Jesse P. Samluk, Daniel G. Mackrides, Dennis W. Prather, Univ. of Delaware (United States) . . . . . [7837-13]

09.40: **Polarimetric imaging with the 91GHz radiometer SPIRA**, Axel Murk, Oliver Stähli, Christian Mätzler, Univ. Bern (Switzerland); Roland Öchslin, Peter Wellig, Armasuisse (Switzerland); Denis Nötel, Helmut Essen, Fraunhofer FHR (Germany) . . . . . [7837-14]

10.00: **Identification of explosive using the spectrum dynamics of reflected THz and GHz radiation**, Vyacheslav A. Trofimov, Svetnana A. Varentsova, Lomonosov Moscow State Univ. (Russian Federation); Jian Chen, Portland State Univ. (United States) . . . . . [7837-16]

Coffee Break . . . . . 10.20 to 10.50

SESSION 4
Room: Diamant . . . . . Tues. 10.50 to 12.30

Aperture Synthesis Imaging Systems and Electronic Sensors

Session Chairs: **Markus Peichl,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Amir Abramovich,** Ariel Univ. Ctr. of Samaria (Israel)

10.50: **Passive millimeter wave imaging using a distributed aperture and optical upconversion**, Thomas E. Dillon III, Christopher A. Schuetz, Richard D. Martin, Daniel G. Mackrides, Phase Sensitive Innovations, Inc. (United States); Dennis W. Prather, Univ. of Delaware (United States) . . . . . [7837-17]

11.10: **First imagery generated by a digital beam-forming real-time passive millimetre wave imager**, Neil A. Salmon, QinetiQ Ltd. (United Kingdom) . . . . . [7837-18]

11.30: **Trade-off assessment for a passive near-field imaging system**, Francesco Torres, Jordi Abril, Enrique Nova, Antoni Broquetas, Jordi Romeu, Luís Jofre, Univ. Politècnica de Catalunya (Spain) . . . . . [7837-19]

11.50: **Computer resource estimation for video-rate digital interferometry imagers**, Fernando E. Ortiz, Eric J. Kelmelis, EM Photonics, Inc. (United States); Richard D. Martin, Phase Sensitive Innovations, Inc. (United States) . . . . . [7837-20]

12.10: **Micro-Doppler radar signatures of human activity,** Michael C. Moulton, Air Force Research Lab. (United States); Carla Benton, Douglas T. Petkie, Wright State Univ. (United States). . . . . [7837-21]

Posters—Tuesday
Room: Diamant . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

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Influence of packaging on spectra of materials in THz range, Norbert Palka, Tomasz Trzcinski, Mieczyslaw Szustakowski, Przemyslaw Zagrajek, Military Univ. of Technology (Poland) . . . . . [7837-22]

Calibration source and temperature standard for passive millimetre wave imagers, Christopher T. Taylor, Peter L. Scicluna, The Univ. of Manchester (United Kingdom); Neil A. Salmon, QinetiQ Ltd. (United Kingdom); Peter N. Wilkinson, The Univ. of Manchester (United Kingdom) . . . . . [7837-23]

Sensor fusion-based security concept on airports with a rotating millimetre wave person scanner, Sebastian Hantscher, Stefan Lang, Manfred Hägelen, Helmut W. Essen, Fraunhofer FHR (Germany); Axel Tessmann, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) . . . . . [7837-24]

Monday-Tuesday 20-21 September 2010 • Part of Proceedings of SPIE Vol. 7838

Optics and Photonics for Counterterrorism and Crime Fighting

Monday 20 September

Welcome and Introduction
Room: Guillaumet 2. . . . . .Mon. 09.20 to 09.30

Colin Lewis, Ministry of Defence (United Kingdom); **Doug Burgess,** Burgess Consulting (United Kingdom)

SESSION 1
Room: Guillaumet 2. . . . . .Mon. 09.30 to 12.00

Local Sensing: Nuclear, Crime Scenes, Narcotics, Explosives, and Chemical and Biological Agents I

Session Chair: **Colin Lewis,** Ministry of Defence (United Kingdom)

09.30: **Pyrochemical and electrochemical separations studies on plutonium**, Asharf E. Mohamed, World Institute for Nuclear Security (Egypt) . . . . . .[7838A-01]

09.50: **Imaging the time sequence of latent electrostatic fingerprints**, Philip Watson, Robert J. Prance, Helen Prance, Sam T. Beardsmore-Rust, Univ. of Sussex (United Kingdom). . . . . .[7838A-02]

10.10: **Detection of illicit drugs with the technique of Spectral Fluorescence Signatures (SFS)**, Sergey M. Babichenko, Laser Diagnostic Instruments AS (Estonia); Larisa Poryvkina, Nartest AS (Estonia). . . . . .[7838A-04]

Coffee Break . . . . . .10.30 to 11.00

11.00: **Fast detection of narcotics by single photon ionization mass spectrometry and laser ion mobility spectrometry**, Robert Laudien, Rainer H. Schultze, Jochen Wieser, OPTIMARE Analytik GmbH & Co. KG (Germany) . . . . . .[7838A-05]

11.20: **Low-noise CMOS imager with an integrated emission filter for the detection of chemical warfare agents**, Yonathan Dattner, Orly Yadid-Pecht, Univ. of Calgary (Canada) . . . . . .[7838A-07]

11.40: **Chemical sensing of dangerous substances based on mid-IR spectroscopy and thin silver halide waveguide sensors**, Ben-Zion Dekel, Ruppin Academic Ctr. (Israel); Abraham Katzir, Tel Aviv Univ. (Israel) . . . . . .[7838A-08]

Lunch Break . . . . . .12.00 to 13.20

SESSION 2
Room: Guillaumet 2. . . . . .Mon. 13.20 to 15.00

Local Sensing: Nuclear, Crime Scenes, Narcotics, Explosives, and Chemical and Biological Agents II

Session Chair: **Colin Lewis,** Ministry of Defence (United Kingdom)

13.20: **Trace detection of nitrogen-based explosives with UV-PLF**, Jens-Uwe Guenther, Christian Bohling, SECOPTA GmbH (Germany); Mario Mordmueller, Technische Univ. Clausthal (Germany); Wolfgang Schade, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany) . . . . . .[7838A-09]

13.40: **Detection of concealed substances in sealed opaque plastic and coloured glass containers using SORS**, Paul W. Loeffen, Matthew Bloomfield, Cobalt Light Systems Ltd. (United Kingdom); Pavel Matousek, Rutherford Appleton Lab. (United Kingdom). . . . . .[7838A-54]

14.00: **Portable and rapid Raman-based biological and chemical identification**, Marie Lesaicherre, Morpho Detection (United States); Hacene Boudries, Tracy L. Paxon, Frank J. Mondello, Scott Duthie, Andrew A. Burns, Andrew Pris, Amy Linsebigler, GE Global Research (United States). . . . . .[7838A-10]

14.20: **Advances in Quantum Cascade Lasers for security and crime-fighting**, Robert J. Stokes, Univ. of Strathclyde (United Kingdom); Kenneth A. Hay, L-3 Communications InfraredVision Technology Corp. (United States); Erwan L. Normand, Cascade Technologies Ltd. (United Kingdom); Brian E. Foulger, Colin Lewis, Ministry of Defence (United Kingdom) . . . . . .[7838A-27]

14.40: **Identification of substance in complicated mixture of simulants under the action of THz radiation on the base of SDA method**, Vyacheslav A. Trofimov, Svetlana Varentsova, Lomonosov Moscow State Univ. (Russian Federation); Arunas Krotkus, Gediminas Molis, Puslaidininkiu Fizikos Institutas (Lithuania) . . . . . .[7838A-11]

Coffee Break . . . . . .15.00 to 15.30

Security+Defence Europe 2010: Plenary Session

Monday 20 September, 15.30 to 17.15 hrs

For details see page 6

Tuesday 21 September

SESSION 3
Room: Guillaumet 2. . . . . Tues. 08.30 to 12.10

Stand-off Sensing

Session Chair: **Douglas Burgess,** Burgess Consulting (United Kingdom)

08.30: **Remote sensing of explosives with optical methods** *(Keynote Presentation),* Timothy J. Johnson, Thomas A. Blake, Pacific Northwest National Lab. (United States); David S. Moore, Los Alamos National Lab. (United States) . . . . . [7838A-12]

09.00: **Highly sensitive standoff detection and identification of traces of explosives and of biological and chemical agents** *(Invited Paper)*, Salman Rosenwaks, Alexandr Portnov, Illana Bar, Ben-Gurion Univ. of the Negev (Israel). . . . . .[7838A-13]

09.25: **Ultrafast laser quantum control for explosives detection**, Margo Greenfield, R. Jason Scharff, Shawn D. McGrane, David S. Moore, Los Alamos National Lab. (United States) . . . . . .[7838A-14]

09.45: **Stand-off Raman spectroscopy of explosives**, Bernhard Zachhuber, Alison J. Hobro, Bernhard Lendl, Technische Univ. Wien (Austria) . . . . . .[7838A-15]

10.05: **Near-infrared spectroscopy for personal screening**, Céline M. Canal, Aamer Saleem, Roger J. Green, David A. Hutchins, The Univ. of Warwick (United Kingdom) . . . . . .[7838A-16]

Coffee Break . . . . . .10.25 to 10.50

10.50: **Distributed nerve gases sensor based on IR absorption in hollow optical fiber**, Roberto Viola, Nicola Liberatore, Domenico Luciani, Sandro Mengali, Consorzio CREO (Italy); Luigi Pierno, SELEX Sistemi Integrati S.p.A. (Italy) . . . . . .[7838A-19]

11.10: **Stand-off detection at the DLR laser test range applying laser-induced breakdown spectroscopy**, Frank R. Duschek, Carsten Pargmann, Jürgen Handke, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . .[7838A-18]

11.30: **Bioaerosol standoff detection and correlation assessment with concentration and viability point sensors**, Sylvie Buteau, Jean-Robert Simard, Susan Rowsell, Gilles A. Roy, Defence Research and Development Canada (Canada) . . . . . .[7838A-17]

11.50: **High-resolution active laser imaging and range gating at 1.5 µm up to 10 km**, Andrea Ruffini, Marco Vitiello, Andrea Pizzarulli, Alessandro Rossi, Gem Elettronica Srl (Italy) . . . . . .[7838A-20]

Lunch/Exhibition Break . . . . . 12.10 to 13.20

SESSION 4
Room: Guillaumet 2. . . . . Tues. 13.20 to 16.10

Video Analytics: Image Understanding and Interpretation

Session Chair: **Douglas Burgess,**
Burgess Consulting (United Kingdom)

13.20: **Application of scene understanding to representative military imagery**, Natalie Dyer, Defence Science and Technology Lab. (United Kingdom) . . . . . .[7838A-21]

13.40: **Machine learning for real-time remote detection**, Benjamin Labbé, Institut National des Sciences Appliquées de Rouen (France); Jérôme Fournier, Gilles Henaff, Bénédicte Bascle, Thales Optronique S.A. (France); Stéphane Canu, Institut National des Sciences Appliquées de Rouen (France) . . . . . .[7838A-22]

14.00: **A space variant Maximum Average Correlation Height (MACH) filter for object recognition in real-time thermal images for security applications**, Akber A. Gardezi, Univ. of Sussex (United Kingdom) and COMSATS Institute of Information Technology (Pakistan); Ahmad T. Al-Kandri, Univ. of Sussex (United Kingdom) and Kuwaiti Armed Force (Kuwait); Philip M. Birch, Rupert C. D. Young, Chris Chatwin, Univ. of Sussex (United Kingdom) . . . . . .[7838A-23]

14.20: **Illumination independent object recognitions using multispectral imaging technique**, Izzati Ibrahim, Peter W. Yuen, Aristeidis Tsitiridis, Tong Chen, Kan Hong, James Jackman, David B. James, Mark A. Richardson, Cranfield Univ. (United Kingdom) .[7838A-24]

14.40: **The Image library for intelligent detection systems (i-LIDS)**, Ian Sillett, Home Office Scientific Development Branch (United Kingdom) . . . . . .[7838A-25]

Coffee Break . . . . . 15.00 to 15.30

15.30: **An improved cortex-like neuromorphic system for target recognitions**, Aristeidis Tsitiridis, Peter W. Yuen, Izzati Ibrahim, Kan Hong, Tong Chen, James Jackman, David B. James, Mark A. Richardson, Cranfield Univ. (United Kingdom) . . . . . .[7838A-26]

15.50: **Liveness iris detection method based on the eye's optical features**, Yuqing He, Beijing Institute of Technology (China); Yushi Hou, Smartiris Biometrics Co., Ltd. (China); Yingjiao Li, Yueming Wang, Beijing Institute of Technology (China) . . . . . .[7838A-28]

Break . . . . . 16.10 to 16.20

Round Table Discussion
Room: Guillaumet 2 . . . . . Tues. 16.20 to 17.30

Novel Technology Ideas to Solve the Hard Problems of Counter-Terrorism and Crime Fighting

Moderator: Doug Burgess, Burgess Consulting (United Kingdom)

Plan to attend and debate real solutions to hard problems; attend the Round Table Discussion and interact with the broader defence community. The discussion is open to everyone. Further opportunity to meet and talk will be during the C-T and crimefighting poster session.

Posters—Tuesday
Room: Guillaumet 2. . . . . Tues. 17.45 to 19.15

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Determining the chronological order of crossing lines using 3D imaging techniques, Ville Heikkinen, Univ. of Helsinki (Finland); Claude Barbeau, Forensic Technology WAI Inc. (Canada); Ivan Kassamakov, Juha P. Aaltonen, Edward Hæggström, Univ. of Helsinki (Finland) . . .[7838A-29]

Digital image processing in high-resolution infrared camera with use of programmable logic device, Tomasz Sosnowski, Grzegorz Bieszczad, Mariusz Kastek, Henryk Madura, Military Univ. of Technology (Poland) . . . . . .[7838A-30]

Hard problems in crimefighting and counter-terrorism: opportunities for new technologies and techniques, Douglas Burgess, Burgess Consulting (United Kingdom) . . . . . .[7838A-31]

Human psychophysiology activity monitoring methods using fiber optic sensors, Marek Zyczkowski, Military Univ. of Technology (Poland); Beata Uzieblo-Zyczkowska, Military Institute of Medicine (Poland) . . . . . .[7838A-32]

Multiplexed detection of biological agents using optical microchip sensors, Devaki Bhatta, Stratophase Ltd. (United Kingdom); Martin B. McDonnell, Elaine A. Perkins, Defence Science and Technology Lab. (United Kingdom). . . . . .[7838A-33]

Fibre loop cavity ring-down spectroscopy for the sensitive and selective detection of minute sample volumes of liquid explosives, Catherine M. Rushworth, University of Oxford (United Kingdom); Claire Vallance, Univ.of Oxford (United Kingdom). . . . . .[7838A-34]

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Optical Materials in Defence Systems Technology

Tuesday 21 September

Posters—Tuesday

Room: Daurat. . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

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Copper(I)-catalyzed Huisgen 1,3-dipolar azide-alkyne cycloaddition for the synthesis of nonlinear electro-optic copolymers, Christophe Galindo, Françoise Soyer, Pierre L. Le Barny, Thales Research & Technology (France) . . . . . .[7838B-48]

Quantum confinement on the carrier contribution to the elastic constants in nonlinear optical and optoelectronic materials, Subhamoy Singharoy, JIS College of Engineering (India). . . . . .[7838B-49]

Photorefractive and photoconductive properties of the organic materials doped with fullerens, quantum dots and nanotubes, Alexey V. Prokhorenkov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); N. Shurpo, Sergey A. Serov, Petr Y. Vasilyev, V. P. Savinov, V. Studeonov, S.I. Vavilov State Optical Institute (Russian Federation); François Kajzar, Univ. d'Angers (France); Natalie V. Kamanina, S.I. Vavilov State Optical Institute (Russian Federation) . . . . . .[7838B-50]

Dispersion polymerization of azo-monomers and methylmethacrylate in the presence of oxazoline macromonomers, Victor Valentin Jerca, Ctr for Organic Chemistry Costin D Nenitescu (Romania); Adriana F. Nicolescu, Ctr for Organic Chemistry Costin D Nenitescu (United States); Dan Sorin Vasilescu, Polytechnical Univ. of Bucharest (Romania); Dumitru Mircea Vuluga, Costin D. Nenitescu Institute of Organic Chemistry (Romania) . . . . . .[7838B-51]

Thursday 23 September

Opening Remarks

Room: Daurat . . . . . .Thurs. 08.30 to 08.40

Roberto Zamboni, Consiglio Nazionale delle Ricerche (Italy); **François Kajzar,** Univ. d'Angers (France); **Emily M. Heckman,** Air Force Research Lab. (USA)

SESSION 5

Room: Daurat. . . . . .Thurs. 08.40 to 10.10

NLO Phenomena

Session Chair: **Chantal Andraud,**
Ecole Normale Supérieure de Lyon (France)

08.40: **Multiple-time-scales dynamical studies of multiphoton nonlinear absorbers for passive all-optical sensor protection against agile-frequency lasers**, Iam Choon Khoo, The Pennsylvania State Univ. (United States). . . . . .[7838B-35]

09.20: **Multifunctional molecular materials and nanostructures for photonics: from molecular engineering to optoelectronic devices** *(Invited Paper)*, Isabelle N. Ledoux-Rak, Anu Anu, Joseph Zyss, Ecole Normale Supérieure de Cachan (France) . . . . . .[7838B-36]

09.50: **Mid-IR non linear materials: chemical synthesis, crystal growth and optical parametric oscillation in $ZnGeP_2$ and $AgGaS_2$**, Johan Petit, Antoine Godard, Myriam Raybaut, Jean-Michel Melkonian, Michel Lefebvre, ONERA (France) . . . . . .[7838B-37]

Coffee Break . . . . . .10.10 to 10.40

SESSION 6

Room: Daurat . . . . . .Thurs. 10.40 to 12.30

Applications

Session Chair: **Roberto Zamboni,**
Consiglio Nazionale delle Ricerche (Italy)

10.40: **Organic-inorganic hybrid materials for photodetection and photovoltaics**, Kwang-Sup Lee, Hannam Univ. (Korea, Republic of) . . . . . .[7838B-38]

11.20: **Luminescent lanthanide complexes for advanced photonic applications** *(Invited Paper)*, Lada N. Puntus, Institute of Radio Engineering and Electronics (Russian Federation) . . . . . .[7838B-39]

11.50: **Dry etching and surface passivation techniques for type-II InAs/GaSb superlattice infrared detectors**, Siew Li Tan, Yu Ling Goh, Sankha Dip Das, Shiyong Zhang, Chee Hing Tan, John P. R. David, The Univ. of Sheffield (United Kingdom); Nutan Gautam, Hasul Kim, Elena Plis, Sanjay Krishna, The Univ. of New Mexico (United States) . . . . .[7838B-40]

12.10: **Demonstration of a high output power 1.5344 µm wavelength Nd:YAG pumped optoparametric oscillator**, Michael D. Wojcik, Robert Foltynowicz, Utah State Univ. (United States); George Lemire, William Brown, Martin Marshall, U.S. Army Dugway Proving Ground (United States) . . . . . .[7838B-41]

Lunch Break . . . . . .12.30 to 13.40

SESSION 7

Room: Daurat. . . . . .Thurs. 13.40 to 17.20

Materials

Session Chair: **Kwang-Sup Lee,** Hannam Univ. (Korea, Republic of)

13.40: **Photochromic and photorefractive materials based on polymers** *(Invited Paper)*, Ana-Maria Albu, Ileana Rau, Dan Sorin Vasilescu, Polytechnical Univ. of Bucharest (Romania) . . . . . .[7838B-42]

14.10: **Bioelectronic sensor applied to robot vision** *(Invited Paper)*, Yoshiko Okada-Shudo, Kazuo Tanaka, Yun Zhang, Masayoshi Watanabe, The Univ. of Electro-Communications (Japan); Katsuyuki Kasai, Shukichi Tanaka, National Institute of Information and Communications Technology (Japan). . . . . .[7838B-43]

14.40: **Plasmon resonances of bimetal nanostructures with tunable optical properties**, Ludmila Raguin, ETH Zurich (Switzerland); Tatiana Samrowski, Univ. of Zürich (Switzerland); Christian Hafner, Ralf Hiptmair, Rüdiger Vahldieck, ETH Zurich (Switzerland) . . . . . .[7838B-44]

15.00: **Development of high quality single crystal diamond for novel laser applications**, Ian Friel, Sarah Geoghegan, Daniel Twitchen, Geoffrey A. Scarsbrook, Element Six (UK) Ltd. (United Kingdom); Peter J. Santini, Element Six (United States). . . . . .[7838B-45]

Coffee Break . . . . . .15.20 to 15.40

15.40: **Adding interactivity to surfaces using photosensitive Q-foils**, Robert Koeppe, isiQiri interface technologies GmbH (Austria); Petr Bartu, Johannes Kepler Univ. Linz (Austria); Anton Neulinger, isiQiri interface technologies GmbH (Austria); Siegfried Bauer, Johannes Kepler Univ. Linz (Austria) . . . . . .[7838B-46]

16.00: **Side-chain polymers bearing azo-moieties for nonlinear optics**, Florica Adriana Nicolescu, Victor Valentin Jerca, Costin D. Nenitescu Institute of Organic Chemistry (Romania); Ioan Dancus, Adrian Petris, Valentin I. Vlad, National Institute for Lasers, Plasma and Radiation Physics (Romania); Dan Sorin Vasilescu, Polytechnical Univ. of Bucharest (Romania); Dumitru Mircea Vuluga, Costin D. Nenitescu Institute of Organic Chemistry (Romania) . . . . . .[7838B-47]

16.20: **Biophotonic molecules for near-infrared** *(Invited Paper)*, Yann Bretonnière, Olivier Maury, Chantal Andraud, Ecole Normale Supérieure de Lyon (France) . . . . . .[7838B-52]

16.50: **Direct imaging of strongly-coupled plasmonic waves** *(Invited Paper)*, Ludovic Douillard, C. Fiorin, Fabrice Charra, Commissariat à l'Énergie Atomique (France) . . . . . .[7838B-53]

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