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Conferences

SD101 Unmanned/Unattended Sensors and Sensor Networks .......................... 3
SD102 Electro-Optical and Infrared Systems: Technology and Applications .................................................. 4
SD103 Electro-Optical Remote Sensing .............................................................. 4
SD104 Technologies for Optical Countermeasures ............................................ 5
SD105 Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing .................................... 5
SD106 Advanced Free-Space Optical Communication Techniques and Applications .................................................. 6
SD107 Photonic Components and Architectures in Defence Systems .............. 6
SD108 Millimetre Wave and Terahertz Sensors and Technology .................... 7
SD109 Optical Materials in Defence Systems Technology ............................... 8
SD110 Optics and Photonics for Counterterrorism and Crime Fighting .......... 8
SD111 Optically Based Biological and Chemical Detection for Defence ........ 9
General Information ................................................................................. 10
Abstract Submission Information .............................................................. 12

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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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Plan now to participate

The Organising Committee of the seventh SPIE Security+Defence, invites you to submit papers to this exciting meeting: this event crosses the divide between fundamental optical science and the application of the underpinning technologies in advanced defence and security systems. This symposium will be co-located with the 17th SPIE Remote Sensing, which enhances opportunities to identify new partners for collaboration from related fields of activity.

Showcase your multi-disciplinary research in a major international forum. New challenges continue to emerge as strategies such as network-enabled capability/networkcentric warfare evolve. Similarly, the problems posed by asymmetric warfare, by military operations in the urban theatre and in peacekeeping are changing the way that the fundamental and emerging technology base is likely to be exploited in the future.

This unique symposium will offer many opportunities to network with colleagues from a variety of disciplines in academia, industry, and government from all over the world, while still maintaining a distinctly European focus.

SPIE Security+Defence will consider all aspects of this evolving field of optronics and photonics:

- Materials
- Optical devices
- Enabling technologies
- Advanced concepts
- Sensors (including their design, fabrication and exploitation)
- Silicon micro-systems
- Nanotechnology
- Bio-inspiration and biomimetics
- Signal processing and control
- Laser technologies and their application
- Electro-optic systems and concepts
- Modelling and simulation.

Other relevant topics are also welcome to ensure a vibrant meeting. Engineers and researchers from government, military, academia and the commercial sector will discuss current status and future directions of a wide range of R&D projects. Participation from academic institutes is especially encouraged; graduate and undergraduate student researchers are invited to submit their work and interact with international leaders. All papers presented at this event will appear in the SPIE Digital Library.

We look forward to seeing you at Security+Defence 2010, where opportunities abound for combining cutting-edge science and technology with the beauty of the historic city of Toulouse, home base of the European aerospace industry.
Call for Papers

Unmanned/Unattended Sensors and Sensor Networks (SD101)
Conference Chair: Edward M. Carapezza, DARPA and Univ. of Connecticut (United States)
Programme Committee: James S. Albus, National Institute of Standards and Technology (United States); Mehdi Anwar, Univ. of Connecticut (United States); Sachi V. Desai, U.S. Army Armament Research, Development and Engineering Ctr. (United States); Grant R. Gerhart, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (United States); Todd M. Hintz, Space and Naval Warfare Systems Command (United States); Myron E. Hohil, Ivan Kadar, Interlink Systems Sciences, Inc. (United States); Nino Srour, U.S. Army Research Lab. (United States); Huub A. van Hoof, TNO Defence, Security and Safety (Netherlands)

This conference will offer an opportunity to explore and promote advances in all aspects of unmanned and unattended sensors and potential uses and benefits for peacetime and wartime scenarios. The objectives of this conference are to foster interest by the potential customer community, and partnerships, and technology sharing by the research, development, and acquisition communities.

Papers are solicited related to unmanned ground and ocean sensors in the following areas:
• application concepts for unattended ground and ocean sensors (e.g. force protection, counter and nonproliferation, treaty verification, cooperative monitoring, drug/tax enforcement, counter-terrorism, border protection, replacement for explosive mine systems, etc.)
• unattended and micro-unattended ground sensor technologies for both ground (built up and open terrain) and ocean/littoral environments including imaging (visible and IR), seismic, acoustic, magnetic, turbulence, chemical and biological sensors and related sensor systems.
• environmental models (seismic, acoustic, etc) and signal source models and characterizations (aircraft, ground vehicles, humans, animals, facilities, etc), unattended and micro-unattended ground sensor technologies for both ground (built up and open terrain) and littoral environments including imaging, seismic, acoustic, magnetic, turbulence, chemical and biological sensors and related sensor systems.
• smart sensor, computationally efficient signal and data processing algorithms (e.g. detection, classification, ID, tracking, data fusion, data compression, array initialization and organization, and power management) and related intelligent processing technologies mobile unattended and micro-unattended ground and ocean sensors.
• sensor exfiltration and command and control technologies including communications and tag related technologies for systems of unattended ground sensors (e.g. mobile and implanted devices including control, information transmission, and multi-platform and sensor networking approaches and technologies)
• ground and ocean sensor platform developments and system-level technologies and concepts (e.g. modularity, concealment, power management and storage, platform management, emplacement, countermeasures, and tamper proofing).
• unattended sensor deployment technologies (e.g. air delivery, wall attachment, wall climbing, submerged attachments)
• systems’ integration
• biologically inspired sensors
• novel power and energy conversion systems for sensors (e.g. solar, wind, ocean, microbial, motion parasitic).

Papers are solicited related to unmanned ground, air and ocean sensor systems, vehicles and associated sensor networks in the following topic areas:
• intelligent vehicle systems including embedded world and vehicle realtime control models and architectures
• machine perception, path planning and navigation
• intelligent vehicle collaboration and co-ordination with other vehicles and fixed sensor systems
• vehicle mobility, motion control, and novel mobility platforms
• sensor deployment and recovery technologies for unmanned vehicle operations
• vehicle payloads and mission execution
• operator interface, human-robot interactions, man/machine interface
• biologically inspired air, ground and underwater robotic and sensor systems
• vehicle sensor configurations for enhanced mobility, collaboration, and perception
• sensor fusion, sensor field management, and integration
• sensor and vehicle communication systems (e.g. underwater acoustic comms, RF, laser, etc)
• system performance modeling and simulation
• government Programmes: technical and performance challenges
• commercial and civilian UAVs, UGVs, and UUVs.

Critical Dates
Abstract Due Date: 22 March 2010

Please Note: Submissions imply the intent of at least one author to register, attend the conference, present the paper as scheduled, and submit a full-length manuscript for publication in the conference proceedings.
Electro-Optical and Infrared Systems: Technology and Applications (SD102)

Conference Chairs: David A. Huckridge, QinetiQ Ltd. (United Kingdom); Reinhard R. Ebert, Fraunhofer FOM (Germany)

Programme Committee: Christopher Alexay, StingRay Optics, LLC (United States); Jan Y. Anderson, Acro AB (Sweden); Rainer Breiter, AIM Infrarot-Module GmbH (Germany); Gordon A. Cain, VisionIC Ltd. (United Kingdom); David J. Clarke, SELEX GALEIO (United Kingdom); Stefania De Vito, SELEX GALileo (Italy); Gérard L. Destéphanis, CEA LETI Minater. (France); Jean-Claude L. Fontanella, Thales Optronique S.A. (France); Natan S. Kopelka, Ben-Gurion Univ. of the Negev (Israel); José M. 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)

Developments in electro-optic and infrared systems are key to providing enhanced capability to military forces. Advances in these technologies have been aimed not only at increasing system performance but also in making the systems accessible to more users through reductions in size, weight, and cost. These improvements will produce operational benefits in current applications as well as opening up new applications for E-O and IR systems in both the military and commercial environments.

EO and IR systems are also likely to benefit from recent advances in material research, for example new carbon based materials, nano-materials and metamaterials. These new materials promise new EO properties that could significantly change the way EO and IR systems are designed and built, e.g. new detector systems with enhanced properties or negative refractive index materials which could radically change the way optics are designed.

Computational Imaging, e.g. Pupil Plane Encoding, Coded Aperture Imaging, Compressive Imaging, etc., is another family of emerging technologies that will radically alter the way sensor systems are designed. These techniques combine optics and processing to provide a useable output from the sensor and can provide functionality not possible or practical with existing systems. Computational Imaging will require developments in specialist sub-components, non standard optics design and algorithm development to reconstruct the image.

This conference is aimed at bringing together researchers in the fields of E-O and IR sensor technologies, including related material technologies, and those developing systems for defence and dual-use applications. Systems and technologies of interest cover the wavebands from UV to LWIR.

Papers are solicited in the following areas:
- advanced materials for EO/IR, e.g. metamaterials, nano-materials, carbon based materials
- focal plane array detector technologies
- passive imaging, imaging, design and hardware
- active imaging: modelling, design, and hardware
- applications of EO and/or IR systems
- integrated and miniaturized sensors
- novel sensor techniques
- computational imaging: techniques, components, designs and algorithms
- multiband and hyperspectral sensors
- polarisation sensitive sensors
- reduced-cost optics and novel optical techniques
- imaging through the atmosphere
- signal and image processing
- defence and security applications
- system integration issues.

Access last year’s papers for this year’s innovation.

Electro-Optical Remote Sensing (SD103)

Conference Chairs: Gary W. Kamerman, FastMetrix, Inc. (United States); Ove Steinvall, Swedish Defence Research Agency (Sweden)

Programme Committee: Laurent Hespel, ONERA (France); Dennis K. Kilinger, Univ. of South Florida (United States); Peter Lutzmann, Fraunhofer FOM (Germany); Kenneth J. McEwan, Defence Science and Technology Lab. (United Kingdom); David J. Clarke, SELEX GALEIO (United Kingdom); Irene V. Touli, National Taras Shevchenko Univ. of Kyiv (Ukraine); C. Russell Philbrick, North Carolina State Univ. (United States); Peter N. Randall, QinetiQ Ltd. (United Kingdom); Philippe Réfrégier, Institut Fresnel (France); Monte D. Turner, Defense Advanced Research Projects Agency (United States); Johan C. van den Heuvel, TNO Defence, Security and Safety (Netherlands); Maria J. Yzel, Univ. Autónoma de Barcelona (Spain)

Over the last century, electro-optical remote sensing has developed into an essential military technology. The efficiency and efficacy of thermal imagers, light amplification sights, laser designators and rangefinders, and video trackers have been well established. New technologies now permit thermal imaging systems to operate in new spectral domains with improved efficiency. Passive RF devices can image through walls, and laser systems have moved past simple rangefinders to permit high-fidelity, three-dimensional imaging at extended ranges. Synthetic aperture optical radar has the potential to significantly extend the range of three-dimensional imaging. Laser Doppler vibrometry can now identify vehicles well beyond visual ranges. Passive hyperspectral imaging and remote laser spectroscopy can identify material types and even detect the presence of specific chemical species.

Meanwhile, fully automatic target detection, recognition, and identification have been highly desirable, but equally elusive objectives. The development of advanced and affordable signal and high-speed data processing, coupled with these new sensing technologies, now opens the opportunity for both automatic and autonomous target detection, recognition and identification. High-speed digital processing and advanced algorithms enable the fusion of the data from multiple sensors having different resolutions, perspectives and modes of operation at the pixel, feature or detection level to enhance the recognition and identification process.

These advances are coming available at a very opportune time. Low-intensity conflicts, unconventional warfare, urban combat, border security and the continued rise in terrorism has created a need for new and innovative applications of these technologies in very unconventional ways. As a result, these technologies are finding their way into civil defense, law enforcement and counterterrorism efforts.

This conference will focus on new and improved methods, techniques, and applications of electro-optical remote sensing. Recent advances which make electro-optical remote sensing technically or economically viable for an even wider variety of applications will be emphasised. However, the development of technology cannot be effective without serious consideration of the applications of that technology. Papers on military, industrial, and commercial applications are solicited, including:
- robotics, 2D and 3D machine vision, autonomous land vehicle navigation and control, spacecraft docking system, collision avoidance for aircraft and marine vessels
- remote detection and analysis of chemical explosives, mine-like objects, weapons of mass destruction, water and air pollution
- automatic target detection, recognition and identification, signal and data processing, image segmentation, machine vision and information processing
- non-contact metrology, vibrometry, dynamics, and microdynamics measurement modeling, simulation and model validation
- calibration standards, testing standards and quality assurance procedures
- surveillance sensors, short and long distance ranging systems, topographic mapping and bathymetry systems, remote sensing of vegetation, surveying and image building component technology and novel system architecture and applications
- security issues such as border control, remote explosive detection, general dangerous materials, person recognition at distance, weapon detection, see-through media (vegetation, water, smoke and fire) etc.

The objective of this conference is to bring together engineers and scientists from academia, industry and government from around the world to exchange results and ideas for future advancement of electro-optical remote sensing. Oral papers may be from 5 to 20 minutes each. Authors should indicate the amount of time desired for their presentation with the submission of the abstract.
Technologies for Optical Countermeasures (SD104)

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 GAILLÉD (United Kingdom); Anton Kohnle, Fraunhofer FOM (Germany); Espen Lippet, Norwegian Defense Research Establishment (Norway); Stephen P. McGeeoch, Thales Opttronics Ltd. (United Kingdom); Benoît Mellier, DGA/DCE/CELAR (France); Ric H. M. A. Schleijpen, TNO Defence, Security and Safety (Netherlands); Ove Steinval, Swedish Defence Research Agency (Sweden); Mark R. Taylor, Defence Science and Technology Organisation (Australia); Jonny Terry, Univ. of St. Andrews (United Kingdom); Hans D. Tholl, Diehl BGT Defence GmbH & Co. KG (Germany)

The purpose of this conference is to provide a technical forum to enable increased awareness of optical countermeasure techniques and technologies. Optical countermeasure techniques have been used for thousands of years to provide a force multiplier on the battlefield. The use of optical techniques is attractive for a range of military activities as they often offer a simple and cost-effective method of defence.

The advent of the laser offered dramatic changes to all aspects of warfare, but other technologies have proved to be invaluable. This conference offers the opportunity to consider the impact of laser technology and other optical systems on operations on the battlefield. Moreover, this conference brings together the optical community at large and enables a discussion of novel applications of emerging techniques and technologies. Optical devices and technologies are often “dual-use” technologies as they may be used in medicine, manufacture and detection and identification of illegal items. There are a wide range of technologies for consideration at this conference:

- optical sources
- optical techniques
- optical methods

Papers are solicited in the following broad categories of optical device and techniques/technology:

- lasers (all types)
- pyrotechnic and flare devices
- smoke and obscurants
- lamps
- propagation
- beam steering and guiding
- aberration issues and compensation methods
- modelling and simulation
- applications (military and commercial)
- multi-mode/multi-functional operation
- component technology and methods
- “Homeland Defence” issues including: illegal migration, border security and urban operations
- other civil applications

Plus many more.

Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing (SD105)

Conference Chairs: Gary J. Bishop, BAE Systems (United Kingdom); John D. Gonglewski, Air Force Research Lab. (United States)

The purpose of this conference is to provide a technical forum for discussions in the latest developments in the military applications of hyperspectral and airborne high spatial resolution scanning techniques. It has been demonstrated that hyperspectral sensing has the potential to detect low contrast targets which are spectrally only marginally different to the background against which they observed. There are, however, many challenges in developing this technology to a position where it can provide accurate robust information to the warfighter. Of particular interest is the use of these systems in providing discriminating battlefield information from a UAV platform.

There is increasing need on the battlefield to provide wide area persistent surveillance at high spatial resolution for both unmanned and manned. A requirement therefore exists to develop electro optical systems which will provide ISR (Intelligence, Surveillance and Reconnaissance) for wide area persistent monitoring that can continuously detect and track the presence of a large number of targets over a wide target area. This will potentially require the development of compact multi-gigapixel systems with wide field of view optics. It will also need high bandwidth airborne processing.

Original papers are sought on, but not restricted to the following topics:

- design of compact hyperspectral sensors operating in the UV, VIS/ NIF, SWIR, MWIR and LWIR
- installation of hyperspectral sensors in UAV platforms
- stabilisation techniques for hyperspectral sensors on moving platforms to provide registered imagery
- pre- and post-processing techniques to provide well characterised hyperspectral data
- development of novel hyperspectral algorithms for anomaly and matched filter detection techniques
- development of spectral unmixing techniques for detection of sub-pixel targets in hyperspectral data
- techniques for shadow removal and compensation for atmospheric illumination in hyperspectral data
- airborne collection of hyperspectral data including processed results
- techniques for the creation of gigapixel camera systems including creation of composite focal plan arrays
- correction of inflight electro optic data (e.g. correction for atmospheric haze, turbulence, auto focus and auto exposure techniques)
- super pixel resolution enhancement
- high bandwidth airborne processing techniques
- example of data collection from airborne EO sensors.

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Free-space optical communication provides high-capacity data links in defence and security applications. This conference will provide a forum for all professionals involved with free-space optical communication technologies and systems. The conference will cover subjects related to research and technology advances in components and systems, and provide an overview useful to the laser communication specialists to research and technology advancements in components and systems, and finally, analysis of present and future systems are encouraged. Original papers are solicited on, but are not limited to, the following topics:

- space-based systems
- terrestrial and airborne links
- pointing, acquisition, and tracking
- atmospheric effects and compensation techniques
- optical and electronic components supporting free-space optical communications
- laboratory demonstration hardware
- present and future systems
- modulated retroreflective communications
- history of past free-space optical communication systems
- current achievements
- network of sensors
- miscellaneous applications, including identification friend or foe, integration with distributed ground sensors.

This conference brings together emerging activities in microwave photonics, optical processing, displays and their underpinning optical micro-/nano-technologies. Many of the components within optical systems can be miniaturised by exploiting novel microscale and nanoscale device concepts. These include those based on micro-electro-mechanical systems (MEMS), planar waveguide and hybrid organic-inorganic architectures. Other nanostructures are attracting interest with applications ranging from integrated optics to diffractive imaging systems. The understanding of plasmonics and sub-wavelength scale metallo-dielectric structures is advancing, as is the realization of metamaterials at optical wavelengths. Such components can potentially provide for unprecedented advance in the ability to control the propagation of light. Architectures and techniques for imaging under difficult conditions lie at the heart of many defence and security applications of photonics. Techniques to improve target discrimination and vision through turbulent atmospheres form an essential complement; both pre-detector and post-detector processing techniques are making rapid progress. Components and techniques for active imaging pave the way to new round-the-clock capabilities. In the area of display technology, flat panel devices now underpin the human-machine interface. Liquid crystal devices and digital light projection engines are ubiquitous, but new formats are appearing notably those based on light emitting organic materials. The desire to develop flexible displays is driving new approaches, including those based on full electronic paper concepts. For handheld devices, there is need to reduce power consumption and new display architectures are emerging such as those based on zenithal bistable technologies.

The area of microwave photonics is concerned with the processing of RF and high speed digital signals for applications such as the control of arrayed antenna, and advanced wireless communications including MIMO and UWB systems. Benefits are found in enhancing the performance of traditional defense equipment (e.g. radar and electronic warfare systems) as well as in emerging domains such as satellite communications or optical wireless systems for security purposes. The potential benefits afforded by the processing of signals in the optical domain by superimposition of RF signals on an optical carrier are well established. These emerge as a result of the parallelism of optical processes, which lend themselves to a time bandwidth product that cannot be easily realised by any digital architecture. However, despite such promise, progress continues to be limited because of shortfalls in areas such as dynamic range, spurious noise effects and phase stability. Solutions are required to overcome such shortfalls, through novel system architectures, component design and in end-to-end modeling of performance.
Improved active and passive components are required, including laser sources, modulators and photodetectors. This activity also covers optical probing and sensing of RF signals as well as the integration, hybridisation at chip level, advanced materials/devices, and packaging technologies for microwave photonics. New functionalities are expected from this technology such as high-speed analogue to digital conversion and optical synthesis of microwave clock signals and advanced modulation techniques.

The conference seeks papers ranging from the physics of discriminative imaging, advanced displays, microwave photonic components and their functionality to key application areas including antenna remoting, frequency and impedance matching to arbitrary antenna structures, true time delay beam forming for advanced radars/millimetre wave systems (especially those working in high clutter environments), arbitrary waveform generation, RF front-ends, ultra wide band technologies, receiver channelising, accurate time references etc.

Original papers are solicited, in the following areas of activity:

- high-speed/RF lasers, modulators, switches, and detectors
- advanced optical RF sensors and probes
- packaging technologies for microwave photonic devices including integration and interconnect techniques optical sampling and A to D converters
- optoelectronic oscillators
- advanced materials for microwave photonics (PBG, EBG, MOEMS, metamaterials, crystal fibers,...)
- optical signal processing including optical spectra synthesis
- optical amplifiers and nonlinear optics for microwave photonics
- advanced modulation techniques
- microwave photonics modeling and simulation
- advanced arrayed detector concepts, including on-chip optics and processing
- architectures and techniques for discriminative imaging, including active imaging and and imaging through turbulence
- micro-optical-electro-mechanical systems
- novel approaches to micro- and nanophotonics
- display technologies including liquid crystal, plasma, OLED, EL displays, liquid crystal on silicon, flexible and paper displays
- novel low-power and 3D display technologies
- helmet-mounted displays
- light sources including LEDs, lasers, backlight architectures, etc.
- optical components including coatings, films, polarisation control, and recovery systems
- viewing angle enhancement systems
- colour generation.

Call for Papers

Millimetre Wave and Terahertz Sensors and Technology (SD108)

Conference Chairs: Keith A. Krapels, U.S. Army Night Vision & Electronic Sensors Directorate (United States); Neil A. Salmon, QinetiQ Ltd. (United Kingdom)

Programme Committee: Amir Abramovich, Ariel Univ. Ctr. of Samaria (Israel); Nicholas J. Bowling, Manchester Metropolitan Univ. (United Kingdom); Eddie L. Jacobs, The Univ. of Memphis (United States); Markus Peichl, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Douglas T. Petkie, Wright State Univ. (United States); Christopher A. Schuetz, Phase Sensitive Innovations, Inc. (United States)

This conference provides a technical forum for increased awareness of enabling component technology developments, new and novel sensors, signal and image processing, and specific applications in the spectral band from 30GHz to 10THz.

Herefore, most imaging has been done at optical and infrared wavelengths. In those bands, there are practical, affordable technologies which have been available for many years. However, at longer wavelengths, in the mmW and Thz bands, components and systems architectures are still emerging, offering new and complementary sensing modalities in terms of radiation propagation characteristics and information content sensed.

Passive millimeter wave imaging (1 millimeter to 10 millimeters) offers the opportunity to image in both fair and poor weather conditions. Furthermore the ability to penetrate dielectrics has given rise to new applications in security scanning where hidden weapons or contraband can be detected under clothing or hidden packages.

Terahertz sensing, in the range between 300 GHz to 10 THz (1 millimeter to 30 micrometers), is attracting increased interest from military and security fields. This has to a large degree been stimulated by developments in novel detector and source technologies. These have lead to many new potential applications. There has also been exciting progress and new results in THz chemical and biological signature sensing and in the field of medicine.

Papers are solicited in the following broad areas of component technologies, sensors and applications:

- component technology: receivers, amplifiers, detectors, heterodyne mixers, sources, transmission lines and the associated packaging
- enabling technology: compressive sensing, MEMS, nanostructure and nanotechnology and photonic and optoelectronic technologies
- modeling, simulation and phenomenology
- imaging systems
- aircraft landing in poor/no visibility and ground taxing
- concealed weapons and contraband detection
- handheld, portal and stand-off screening systems
- adverse weather intelligence, surveillance and reconnaissance imaging
- biomedical imaging
- driving/navigation on land and sea
- image and signal processing
- resolution enhancement/super-resolution
- spectroscopy and signatures
- non-imaging military applications
- ballistic missile (launch)/warhead detection/tracking
- stand-off mmW threat warning systems
- mmW radar
- civil/commercial remote sensing
- oil spill detection/tracking
- earth observation
- natural disaster assessment.

Critical Dates
Abstract Due Date: 22 March 2010

Please Note: Submissions imply the intent of at least one author to register, attend the conference, present the paper as scheduled, and submit a full-length manuscript for publication in the conference proceedings.

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Optical Materials in Defence Systems Technology (SD109)

Conference Chairs: Roberto Zamboni, Consiglio Nazionale delle Ricerche (Italy); François Kazjar, Univ. d’Angers (France); Emily M. Heckman, Air Force Research Lab. (United States)

Programme Committee: Chantal Andraud, Ecole Normale Supérieure de Lyon (France); André-Jean Attias, Univ. Pierre et Marie Curie (France); Carrie Martins, Air Force Research Lab. (United States); Werner J. Blau, Trinity College Dublin (Ireland); Fabrice Charra, Commissariat à l’Énergie Atomique (France); Larry R. Dalton, Univ. of Washington (United States); Manfred Eich, Technische Univ. Hamburg-Harburg (Germany); Patrick Fenyeyrou, Thales Research & Technology (France); Barrett Flake, European Office of Aerospace Research and Development (United States); Charles Y. C. Lee, Air Force Office of Scientific Research (United States); Antoni C. Milus, Wroclaw Univ. of Technology (Poland); Dieter Neher, Univ. Potsdam (Germany); Robert L. Nelson, Air Force Research Lab. (United States); Franka Ouchen, Air Force Research Lab. (United States); Ulrich Pietsch, Univ. Siegen (Germany); Ilene Rau, Polytechnical Univ. of Bucharest (Romania); Marina Saphiannikova, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany); Niyazi S. Sariciftci, Johannes Kepler Univ. Linz (Austria); Kenneth D. Singer, Case Western Reserve Univ. (United States)

This conference will highlight new and established nano-, bio- and metamaterials and devices for photonic, electronic, and optoelectronic applications and their role in the development of new defence systems. The aim is to review materials and device R&D, in progress, in both Europe and the USA, based on nano-, bio- and metamaterials technologies for photonic, electronic, and optoelectronic applications and to promote closer collaboration and awareness of common objectives and potential advances. It will also seek to bring together researchers from different materials science, physics and engineering areas. The conference should be of interest to research scientists and engineers, project managers, senior scientific staff, materials producers and device manufacturers in Europe and the USA.

Papers should focus on short technology reviews or recent results of new materials processes and devices, with particular application to photonic defence technology. The materials and devices may be based on nano-, bio- and metamaterials-based technologies including inorganics, organics, polymers, biopolymers, and hybrids as well as devices that take advantage of these materials technologies. Papers may address practical, theoretical and modeling aspects of the subject. Fields of study will include:

- organic and inorganic-based photonics
- organic and inorganic-based electronics
- organic and inorganic-based laser and amplifier materials
- organic and inorganic-based solar cells and photovoltaics
- organic and inorganic-based photodetectors
- organic and inorganic-based displays
- nanophotonic structures
- photonic bandgap materials
- biomolecular recognition materials
- biopolymer-based photonics
- biopolymer-based electronics
- biomaterials
- green materials
- plasmonic structures and applications
- metamaterials and metamaterial-based devices
- solid state laser material
- nonlinear optical materials and devices
- ferroelectric and spintronic materials and devices
- modeling of materials growth processes
- modeling of materials parameters for specific applications
- electroluminescent materials and devices
- photorefractive and photochromic materials and processes
- polymer optical waveguides and fibres
- multiphoton processes
- charge transport in organic materials.

Optics and Photonics for Counterterrorism and Crime Fighting (SD110)

Conference Chairs: Colin Lewis, Ministry of Defence (United Kingdom); Doug Burgess, Burgess Consulting (United Kingdom)

Programme Committee: David A. Atkinson, Pacific Northwest National Lab. (United States); Bénédicte Bascle, Thales Research & Technology; Robert Bower, Ministry of Defence (United Kingdom); Antonio Á. Cantu, Consultant (United States); Giovanni Cocco, SELEX GALILEO (United Kingdom); Howard J. Cummins, HAMGEC (United Kingdom); Bruno Desruelle, DGA/DSP/Tour DGA (France); Jean-Christophe Fondeur, Sagem (France); Brian E. Foulger, Ministry of Defence (United Kingdom); Gillian F. Marshall, QinetiQ Ltd. (United Kingdom); Svante Ödman, Swedish Defence Research Agency (Sweden); Harbinder S. Rana, Defence Science and Technology Lab. (United Kingdom); Andrew M. Scott, QinetiQ Ltd. (United Kingdom); Neil C. Shand, Defence Science and Technology Lab. (United Kingdom); Robert J. Stokes, Univ. of Strathclyde (United Kingdom); Olivier Tourret, Sagem Defense Securite (France); Mauro Varasi, Polimeccanica (Italy)

This conference brings together emerging technologies in the field of optics and photonics applied to problems in counter-terrorism and crime-fighting such as the remote detection and identification of explosives and narcotics, and of people involved in suspicious activities. Technical developments in passive and active sensing open up the vision of more affordable instruments that being smaller, lighter, and with a greater discriminating power, are expected to make an increasing contribution to the fight against terrorism and crime.

A combination of optical systems with increased computing power and advanced algorithms will help in difficult scenarios such as the identification of people in crowded environments using face and iris recognition or other biometrics, and will counter the atmospheric turbulence that hampers long range imaging.

The spectrum over which optical and photonic techniques can be used is now extending to terahertz frequencies. This band offers novel imaging systems with increased penetration through barriers, and spectrosopic techniques that can help characterize suspicious materials.

Optical signal processing is being used for secure data transmission. Optical quantum cryptography is already commercially available and other techniques such as chaos cryptography are under development.

Critical Dates

Abstract Due Date: 22 March 2010

Please Note: Submissions imply the intent of at least one author to register, attend the conference, present the paper as scheduled, and submit a full-length manuscript for publication in the conference proceedings.
Optically Based Biological and Chemical Detection for Defence (SD111)

Conference Chairs: Colin Lewis, Ministry of Defence (United Kingdom); Douglas Burgess, Burgess Consulting (United Kingdom)

With the increasing threat of the use of biological and chemical weapons by either terrorist organizations or rogue states, there is renewed interest in the development of CWA and BWA sensors. There is a compelling need for fully integrated and networked environmental sensor solutions that provide for both early warning trigger type detectors coupled with sample collection, and finally confirmatory detectors that can provide accurate species identification. In particular, there is a pressing need for compact, reliable, and rapid biological and chemical agent sensors that are also economical and practical in their operation (e.g. continuous monitoring with limited use of consumables, and little or no operator involvement). In addition to environmental sensors, the development of easily deployable medical diagnostic instruments capable of determining whether an individual has been exposed to a biological pathogen, and the specific nature of the pathogen and its extent of infection, are equally critical to an overall biodefense architecture.

Optically based chemical and biological sensors afford a unique opportunity to address these mission critical needs. The defence of military forces in the field, or defence of the homeland will require special attributes for which optically-based sensors may be particularly well suited.

The objective of this conference is to provide a forum for researchers, product engineers, military/government officials, and system developers to present and discuss the latest developments in optically-based biological and chemical sensor and diagnostic technologies and applications.

Papers are solicited on the following and related topics:
- spectroscopic techniques spanning the deep UV to the far IR
- advances in semiconductor optoelectronic devices applicable to biological and/or chemical sensing
- exploitation of the spectral and spatial characteristics of agent signatures
- Lab-on-Chip concepts and devices (New!)
- novel chemical agent sensor systems
- novel biological agent sensor systems
- automation solutions for medical diagnostics
- agent phenomenology
- trigger detectors
- confirmatory detectors
- diagnostic instruments
- stand-off and point detector systems
- total integrated sensor solutions
- new air sampling technologies
- algorithms for improved spectral discrimination
- simulation tools for modeling sensor performance
- sensor metrics and measurement protocols
- pathogen imaging techniques
- spectral characteristics of relevant backgrounds
- novel optical designs for bio/chem sensors
- techniques for false alarm rate (FAR) reduction.

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Toulouse, also known as 'Ville Rose', is France's fourth biggest city. Located in the southwest region of the country between the Atlantic Ocean and Mediterranean Sea, it is also influenced by the Pyrenees. The city dates back 2,000 years with historic buildings in the central area. Toulouse is now widely recognised as the centre of cutting-edge European technology. The city and surrounding areas have a rich and diverse culture, famous for traditional produces including wine, foie gras, cheeses, and other traditional regional dishes.

For further information on sightseeing and tourist information, please see the Toulouse Tourism website: http://www.uk.toulouse-tourisme.com or alternatively, visit http://www.toulousedefrance.com.

Technical Programme

Registration information and online registration will be available by June 2010.

Conference registration

All participants, including invited speakers, contributed speakers, session chairs, cochairs and committee members must pay a registration fee.

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