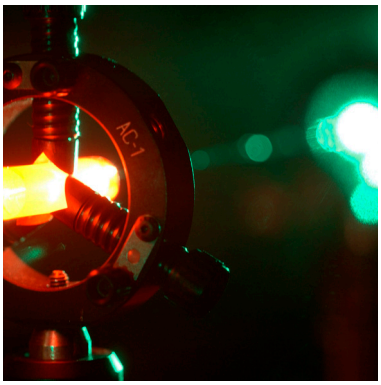
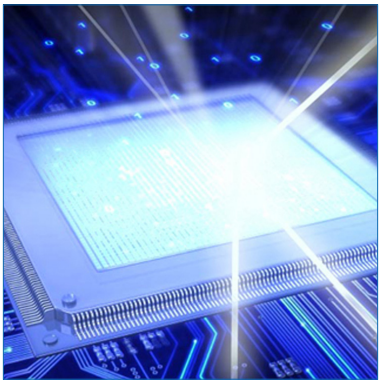
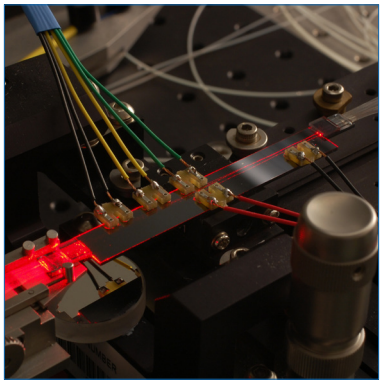
Keynote Forum
August 23, 2018

Laser Tech 2018



International Conference on

Laser, Optics and Photonics

August 23-24, 2018 | Paris, France

Edik U Rafailov

Aston University, UK

New generation of compact quantum-dot based lasers in the near-IR and its efficient conversion to the visible region

In this talk, I will review the recent progress in the development of novel CW and ultrashort pulse quantum dot lasers for the generation of light in the near-IR and visible spectral regions. With a brief introduction on QD laser background information, I will discuss the recent achievements in the development of CW/ultrashort pulse lasers. Then I will present the recent progress in the development of broadly-tuneable near-IR QD lasers in the CW and mode-locked regimes. This talk also will give an overview of the advances made with SHG in nonlinear waveguided crystals pumped by QD lasers and discuss various applications of such light sources.

Speaker Biography

Edik U Rafailov received his PhD from the Ioffe Institute, St Petersburg. Since 1987, he has been engaged in the research and development of different light sources. He was responsible for the first demonstration of novel high-power Al free laser diodes. He was also responsible for the first demonstration of femtosecond pulse generation directly from laser diodes. In 2005 he moved to University of Dundee, UK and established the new group and later in 2014 he moved to Aston University. He has authored and co-authored over 450 articles in refereed journals and conference proceedings, including two books (WILEY), ten invited chapters and numerous invited talks to SPIE, LEOS and CLEO. He also holds 11 UK and two US patents. In 2014 he has been awarded the Lebedev Medal of the Russian Optical Society. He coordinated a €14.7M FP7 IP FAST-DOT and the €12.5M NEWLED projects. Recently he was awarded the H2020 FET project Meso-Brain (€3. 3M) and EPSRC UK) (£1M). He also leads other projects funded by EU FP7H2020 and UK EPSRC. His current research interests include high-power CW, ultrashort-pulse lasers; generation of UV/visible/IR/MIR and THz radiation, nano-structures; nonlintear and integrated optics; and biophotonics.

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allied academies

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Ching Fuh Lin

Hung Chieh Chuang, Meng Jie Lin and Po Jui Huang

National Taiwan University, Taiwan

Silicon based infrared detection with very broadband response using plasmonic resonance

Infrared (IR) detection has many important applications for military, communication, astronomy and medicine. Currently infrared detections are mainly based low-bandgap semiconductors like III-V, II-VI, and so on, which mostly rely on expensive apparatuses for epitaxial growth and are disadvantageous for their complicated processes, and complex device structures. Here we present a novel approach that combines silicon photonics and localized surface plasmon resonance (LSPR) structure to achieve ultra-broadband IR detection. LSPR structure has been widely used to increase the absorption of incident photons in many photoactive devices. However, existing LSPR is only induced in a small designed wavelength range or polarized incident light. Our novel concept applies a 3D metallic array structure. The varying length of metallic structures can excite LSPR with ultra-broadband response. Also, polarization-insensitive detection as well as increased photo response in the infrared spectrum is realized under special metallic structure, 2D periodic array, and 3D optical cavity effect. Through the strong induced LSPR's, we further fabricate the Silicon based schottky photodetector that is able to detect photons well below the schottky barrier height for detection in the mid-infrared range. The detection spectral range covers from visible to over 4 UMS in wavelength.

Speaker Biography

Ching Fuh Lin obtained the B.S. from National Taiwan University in 1983, and the M.S. and PhD from Cornell University, Ithaca, NY, in 1989 and 1993, respectively all in electrical engineering. He is the founding director of Innovative Photonics Advanced Research Centre (i-PARC) and a joint distinguished professor in the Graduate Institute of Photonics and Optoelectronics, Graduate Institute of Electronics Engineering, and Department of Electrical Engineering at National Taiwan University. His major research area is in photonics, including silicon-based photonics, solar cells and applications for drones, broadband semiconductor lasers and optical amplifiers, etc. He is a fellow of IEEE, a fellow of SPIE, and member of Asia-Pacific Academy of Materials. He has published over 180 journal papers and 500 conference papers and holds more than 70 patents. He is the author of several books and obtained many awards.

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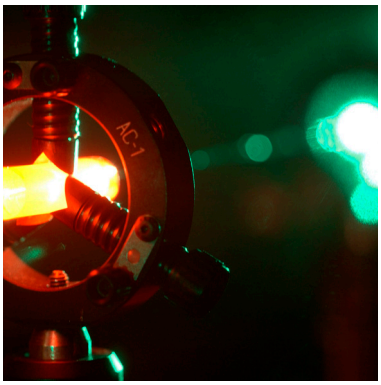


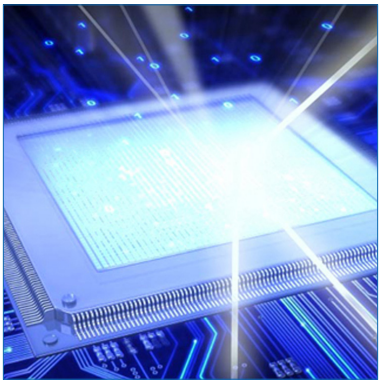
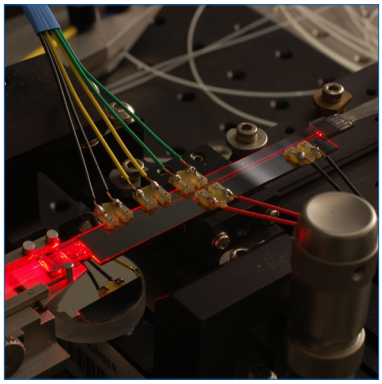

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Jose Pozo

European Photonics Industry Consortium, The Netherlands

Technology trends of the European industry in lasers and optics

Over the last 30 years, new developments in laser systems have impacted strongly on every single aspect in the manufacturing of devices and products that are currently available on the market. Lasers and optics are used in the manufacturing of cars, PCs, and displays as well as in marking steel and in the creation of logos. In lithography, lasers have been the key enabler of wafer-level manufacturing. Furthermore, 3D printing has a central role in the customized manufacturing of devices in the Industry 4.0 era. In ophthalmology and cosmetic surgery, lasers play a key role in maintaining our eyesight and transforming our appearance. The military applications should also not be forgotten as lasers have provided improvements in many areas, such as, range finders, designators, LIDARs, and illuminators. Finally, the biggest industrial breakthrough of photonics in the latest year has been the use of photonic devices (VCSELs, freeform optics, IR detector arrays…) in the consumer market in general, and in mobile phones in particular.

Speaker Biography

Jose Pozo is director of technology and innovation at EPIC (European Photonics Industry Consortium). As EPIC's CTO, he represents 385 companies active in the field of Photonics. His job consists on actively engaging with them and provide them with tools to strengthen their position in the supply chain; such tools are the organization of 20 technology workshops per year, provision of market intelligence and finding B2B leads. He has the vision that the future of optoelectronic manufacturing can take place in Europe to a large extent, and as part of that vision he is actively involved in the EU-funded pilot lines. He has 20 years' background in photonics technology, market knowledge, and a large network within the industrial and academic photonics landscape. He holds a PhD in electrical engineering from the University of Bristol, U.K and a M.Sc. and B.Eng. in telecom engineering from UPNA (Spain) / VUB (Belgium). He has worked as postdoctoral researcher at the Eindhoven University of Technology (The Netherlands), EU proposal coordinator at TNO (The Netherlands), and Sr. Photonics Technology Consultant at PNO Consultants.

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Paul Michael Petersen
Mingjun Chi

DTU Fotonik, Denmark

Diode laser architectures using nonlinear optical interaction and feedback techniques

In this work we discuss diode laser architectures using nonlinear optical interaction and feedback techniques. Different external-cavity feedback techniques to improve the spatial beam quality and narrow the linewidth of the output beam from both BALs and TDLs are presented. Broad area diode laser system with external cavity feedback around 800nm can produce several Watts of output power with a good beam quality. Tapered diode laser systems with external cavity feedback around 800nm and 1060nm can deliver more than 2W output power with diffraction-limited beam quality and can be operated in single-longitudinal mode. These high brightness, narrow linewidth, and tunable external-cavity diode lasers can emerge as the next generation of compact lasers that have the potential of replacing conventional high-power laser systems in many existing applications. In the talk we also present results of a tunable high power GaN green diode laser based on Littrow external-cavity feedback.

Speaker Biography

Paul Michael Petersen is full professor in New Light Sources at the Technical University of Denmark. His research focuses on lasers, LEDs and biomedical optics. He has authored more than 150 international scientific publications and holds 15 patents. He is chairman of DOLL – a Photonics Green lab that tests and develops new lighting technology based on LED and diode laser technologies. From 2002 until 2012 he was appointed adjunct professor in Optics at the Niels Bohr Institute, Copenhagen University.

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