Advanced Research Workshop (ARW): "Terahertz (THz), Mid InfraRed (MIR) and Near InfraRed (NIR) Technologies for Protection of Critical Infrastructures against Explosives and CBRN"

Chateau Liblice, Czech Republic, 5-9 November 2018

Workshop Program

Day 0 - 5/11/2018 - All day arrival at the hotel and conference centre

Day 1 - 6/11/2018

10:10 Opening Ceremony
Organization details/refund procedure/proceedings publication

Plenary Talk

10:30 Manijeh Razeghi
State of the Art and future perspectives of room temperature, high power, widely tunable THz DFG QCL Sources

11:30 *Coffee Break*

State of the Art in sensors for the protection of critical infrastructures

12:00 Konstantinos Ionnidis
O1 Sensor data fusion and autonomous unmanned vehicles for the protection of critical infrastructures

12:30 Ari Karppinen
O2 Fusion Algorithms for airborne threat localisation

13:00 *Lunch*

QCLs, ICLs and their applications to sensing I

15:00 Lutfi Ozyuzer

O3 High-tempearature operation of THz QCLs for explosives detection

15:30 Yingjun Han
O4 Brodband terahertz gas spectroscopy through multimode self-mixing in a quantum cascade laser

16:00 Angelo Sampaolo

O5 Quartz Enhanced Photoacoustic Sensors for CBRNs Detection in THz and Mid-Infrared

16:30 Jelena Radovanovic
O6 Global optimization methods for the design of MIR-THz QCLs applied to explosives detection

17:00 *Coffee Break*

Beyond QCLs, ICLs and Superlattices: competing technologies for detection of explosives and CBRN I

17:30 Norbert Palka
O7 THz and IR stand-off detection of explosives for critical infrastructure protection

18:00 Petr Kuzel
O8 Terahertz conductive response of nanocrystals: effective medium aspects

18:30 Alain Villeneuve
O9 High power fiber laser sources for mid infrared generation by Difference Frequency Generation

19:00 *Dinner*

Day 2 – 7/11/2018

Superlattices and other technologies for GHz-THz sensing

10:00 Maciej Sypek
O10 GHz-THz diffractive optics for security applications

10:30 Feodor Kusmartzev
O11 Tunable graphene-metal hybrid for GHz-THz detection of explosives and CBRN

11:00 Coffee Break

11:30 Mauro Pereira

O12 Tunable nonlinear superlattice multipliers for GHz-THz detection of explosives and CBRN

12:00 Eric Bryerton

O13 Design and Measurements of GHz-THz Transceivers for Sensitive Detection of CBRN Hazards

Beyond QCLs, ICLs and Superlattices: competing technologies for detection of explosives and CBRN II

12:30 Hakan Altan
O14 Development of Stand-Off GHz Imaging Systems using Low Cost Plasma Detectors

13:00 *Lunch*

Beyond QCLs, ICLs and Superlattices: competing technologies for detection of explosives and CBRN III

15:30 Leonid Kulyuk (Culiuc)

O15 Linear and nonlinear optical properties of two-dimensional transition metal dichalcogenides and their potential as materials for CBRN sensors

16:00 Arunas Krotkus
O16 Semiconductor components for THz-TDS systems activated by compact fibre lasers

16:30 Patrik Spanel

O17 Detection of hazardous gases using mass spectroscopy

17:00 *Coffee Break*

17:30 Poster Session

Laura Mihai
P1 Characterization of Mid-IR systems for gas sensing

Anna Herus
P2 Selective detection of methane through quantum electric conductivity of point contacts

Dymitro Harbuz
P3 Sensor profiling of breath gas as a tool to thwart terror attacks

Anna Szerling
P4 Technology of photonic crystals for QCLs

Marilena Giglio
P5 Broadband gas QEPAS detection exploiting a monolithic DFB-QCL array

Apostolos Apostolakis
P6 The role of acoustoelectric effects in THz superlattice radiation sources

Danka Stojanovic
P7 THz chiral metamaterials

Juliana Carvalho
P8 Characterization of gas sensor systems in the infrared region

Marina Turcanu
P9 Effective Raman radiation in Decontamination of Translucent Liquids and Gases

Kseniya Dryahina
P10 Selected ion flow tube mass spectrometry, SIFT-MS, analyses of laser decomposition products of commercially produced explosives and propellants

19:00 *Dinner*

Day 3 – 8/11/2018

QCLs, ICLs and their applications to sensing II

09:30 Johannes Koeth
O18 Mid Infrared DFB ICLs and ICLEDs for sensing applications

10:00 Matthew Singleton
O19 QCL frequency comb sources for spectroscopy

10:30 Kamil Kosiel

O20 Detailed analysis of different metals employed in metal-metal waveguides for THz QCls

11:00 Coffee Break

Beyond QCLs, ICLs and Superlattices: competing technologies for detection of explosives and CBRN IV

11:30 Gennadi Kamarchuk

O21 On the prospect of application of point-contact sensors for solving global security problems

12:00 Johan Stiens
O22 GHz sensing of the impact of ionising radiation in bio-matter: Novel NDT-techniques in the frequencty and time domain featuring deep sub-wavelength resolution

12:30 Antonello Andreone
O23 THz spectroscopy of transition metal dicalchogenides thin films for tunable metadevices

13:00 *Lunch*

15:00 Half-day devoted to formulating workshop conclusions and recommendations I

Starting with a roundtable in GHz-THz-MIR-NIR and biotech applications in security area problems/possible science for peace proposals. This discussion will go hand in hand with the forum “From Academia to Industry" in which research intensive industrial partners can propose pathways for turning fundamental science presented in the Workshop into concrete development projects for commercialization. They can further express their "industrial wish list" of problems that they feel that academic partners can solve to support their current projects and future commercial endeavours, We have the following confirmed

industrial representatives: Virginia Diodes (USA), mirSense (France), Nanoplus (Germany), TeraVil (Lithuania), Orteh (Poland) and Optav Solutions (Canada). They will deliver important talks in the program and take part in the forum.

17:00 Coffee Break

17:30 Half-day devoted to formulating workshop conclusions and recommendations II

18:30 *Dinner*

Day 4 – 9/11/2018 **Departure**