

*JOINT TECHNICAL PROGRAM*

# **CAOL\*2019**

*8-th International Conference on  
Advanced Optoelectronics and Lasers*

*Accompanying events*

## **DSMOLE\*2019**

*Scientific Workshop  
“Data Science in Modern Optoelectronics and  
Laser Engineering”*

## **UM\*2019**

*XVI Scientific Workshop  
“Measurement Uncertainty: Scientific, Normative,  
Applied and Methodical Aspects”*

*IEEE Photonics Society Ukraine Chapter  
V. N. Karazin Kharkiv National University, Ukraine  
Kharkiv National University of Radio Electronics, Ukraine  
Technical University of Sofia, Bulgaria  
University of Guanajuato, Mexico  
Odessa I. I. Mechnikov National University, Ukraine  
Bulgarian Academical Association of Metrology  
Institute of Physics, National Academy of Sciences of Ukraine  
Ministry of Education and Science of Ukraine  
National Scientific Centre “Institute of Metrology”*

Sozopol, Bulgaria  
September 6 – 8, 2019

# JOINT TECHNICAL PROGRAM

International CONFERENCE on ADVANCED OPTOELECTRONICS and LASERS, CAOL\*2019

Accompanying events:

Scientific Workshop "Data Science in Modern Optoelectronics and Laser Engineering", DSMOLE\*2019

XVI Scientific Workshop "Measurement Uncertainty: Scientific, Normative, Applied and Methodical Aspects", UM\*2019

September 6 – 8, 2019

Sozopol, Bulgaria

[www.caolconferences.org](http://www.caolconferences.org)

Thursday, September 5, 2019

14:00 - 18:00 Registration and Accommodation (Lobby, Hotel "Military Marine Club")

Friday, September 6, 2019

08:00 - 9:00 Registration and Accommodation (Lobby, Hotel "Military Marine Club")

09:00 - 09:15 Conference Opening (Cinema Hall, Hotel "Military Marine Club")

Chair: Valerii Semenets, Kharkiv National University of Radio Electronics, Ukraine

09:15 - 10:45 CAOL/DSMOLE/UM Plenary Joint I (Cinema Hall, Hotel "Military Marine Club")

Chair: Oleksiy Shulika, University of Guanajuato, México

09:15 - 09:45 (Invited)

Edik Rafailov (Aston University, Birmingham, UK)

Generation of Tunable Visible Light in Periodically-Poled Nonlinear Waveguided Crystal

09:45 - 10:15 (Invited)

Miguel Andrés (Universidad de Valencia, Spain)

Fiber Characterization Using Whispering Gallery Modes

10:15 - 10:45 (Invited)

Alina Shafronenko (Kharkiv National University of Radio Electronics, Ukraine)

The Fast Modification of Evolutionary Bioinspired Cat Swarm Optimization Method

10:45 - 11:30 Coffee/Tee Break CAOL Poster Session I

11:30 - 13:00 CAOL Plenary II (Cinema Hall, Hotel "Military Marine Club")

Chair: Miguel Andrés, Universitat de Valencia, Spain

11:30 - 12:00 (Invited)

Philippe Roy (XLIM CNRS-University of Limoges, France)

High Peak and Average Power Delivery from Fully-Aperiodic Large-Pitch-Fiber Lasers

12:00 - 12:30 (Invited)

Alexis Kudryashov (Institute of Geosphere Dynamics, Russian Academy of Sciences, Russia)

High-Power Laser Beam Formation and Focusing by Means of Adaptive Optics

12:30 - 13:00 (Invited)

Rostyslav Vlokh (Vlokh Institute of Physical Optics, Lviv, Ukraine)

Optical Vortices Operation Via Parametrical Optic Effects

11:30 - 12:45 DSMOLE, Scientific Workshop

(Small Hall 2, Hotel "Military Marine Club")

Chair: Andriy Yerokhin, Kharkiv National University of Radio Electronics, Ukraine

11:30 - 12:00 (Invited)

Andriy Yerokhin (Kharkiv National University of Radio Electronics, Ukraine)

Geoscience Laser Altimeter System Sparse ICESat Data Processing Based on F-transform

12:00 - 12:15

Lyudmyla Kirichenko (Kharkiv National University of Radio Electronics, Ukraine)

Comparative Analysis of Machine Learning

Classification of Time Series with Fractal Properties

12:15 - 12:30

Paulius Sakalys (Vilniaus Kolegija University of Applied Sciences, Lithuania)

Research of Dependence Between Plant Growing Dynamics and Parameters of Robotic System

12:30 - 12:45

Mykhailo Hunko (Kharkiv National University of Radio Electronics, Ukraine)

Quest Method for Organizing Cloud Processing of Airborne Laser Scanning Data

13:00 - 14:30 Lunch

**CAOL Session I**

(Cinema Hall, Hotel "Military Marine Club")

**14:30 - 16:15****LASER PHYSICS AND APPLICATIONS****Chair: Alexis Kudryashov** (*Institute of Geosphere Dynamics, Russian Academy of Sciences, Russia*)**14:30 - 14:45****Galyna Oleksiienko** (*Sumy State University, Ukraine*)

Focusing Magnetic Field Effect on Wave Dynamics in Plasma-Beam Superheterodyne FEL of Dopplertron Type with Rectilinear REB

**14:45 - 15:00****Svitlana Bugaychuk** (*Institute of Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*)

Amplifier Diodes Designed in Fiber Bragg Gratings

**15:00 - 15:15****Andrii Derzhypolskyi** (*Institute of Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*)

Tunable Associative Readout in Self-Associative Fourier Holography Scheme by Means of Fine Alignment

**15:15 - 15:30****Nugzar Gomidze** (*Batumi Shota Rustaveli State University, Georgia*)

To the Diagnostics of Optically Dense Media via Phase Screen Model

**15:30 - 15:45****Mikhail Grishin** (*A.M. Prokhorov General Physics Institute, Russian Academy of Sciences, Moscow, Russia*)

A Pulsed Diode Laser for Tectonic Aerosol Lidar Sensing

**15:45 - 16:00****Irina Rushnova** (*Belarusian State University, Minsk, Belarus*)

Low-Voltage Light Beam Steering by Planar Dual-Domain Nematic Liquid Crystal Deflector

**16:00 - 16:15****Mikhail Grishin** (*A.M. Prokhorov General Physics Institute, Russian Academy of Science, Moscow, Russia*)

75 m Laser Strainmeter and Aerosol Lidar for Monitoring the Compression/Expansion of the Earth's Crust in the Baksan Neutrino Observatory

**CAOL Session II**

(Small Hall 1, Hotel "Military Marine Club")

**14:30 - 16:30****BIOPHOTONICS AND LASER MEDICINE (I)****Chair: Anatolii Korobov** (*V.N. Karazin Kharkiv National University, Ukraine*)**14:30 - 15:00 (Invited)****Inna Plastun** (*Yuri Gagarin State Technical University of Saratov, Russia*)

Biomedical Application of Modified Nanodiamonds: Targeted Drug Delivery and Enhancement of Therapeutic Effect Due to Supramolecular Mechanisms

**15:00 - 15:15****Sergii Gryshchenko** (*Kharkiv National University of Radio Electronics, Ukraine*)

Monte Carlo Method for Analyzing the Propagation of Radiation in the Skin Layers Containing Blood in Photoplethysmography

**15:15 - 15:30****Denis Lapitan** (*Moscow Regional Research and Clinical Institute named after M.F. Vladimirovsky, LLC "Medical Optical Diagnostic Systems", Moscow, Russia*)

Analytical Assessment of the Modulation Depth of Photoplethysmographic Signal Based on the Modified Beer-Lambert Law

**15:30 - 15:45****Eugene Stranadko** (*State Scientific Center for Laser Medicine, Moscow, Russia*)

Photodynamic Therapy for Skin Cancer of Critical Locations

**15:45 - 16:00****Valery Volgin** (*N.N. Burdenko Main Military Clinical Hospital, Moscow, Russia*)

20 Years of Experience with Photodynamic Therapy in the N.N. Burdenko Main Military Clinical Hospital

**16:00 - 16:15****Elena Klimova** (*V.T.Zaitsev Institute of General and Emergency Surgery, NAMS of Ukraine, Kharkiv, Ukraine*)

Mechanisms of Immunocorrective Action of Complex Treatment Using Photodynamic, Cell and Tissue Therapy in Patients with Purulent Wounds of the Lower Extremities

**16:15 - 16:30****Yulija Ivanova** (*V.T.Zaitsev Institute of General and Emergency Surgery, NAMS of Ukraine, Kharkiv, Ukraine*)

Phototherapy and Synthetic Wound Dressings in the Treatment of Trophic Ulcers of Venous Etiology

**DSMOLE, Scientific Workshop**

(Small Hall 2, Hotel "Military Marine Club")

**14:30 - 16:00****DATA SCIENCE IN MODERN OPTOELECTRONICS AND LASER ENGINEERING****Chair: Andriy Yerokhin**, *Kharkiv National University of Radio Electronics, Ukraine***14:30 - 14:45****Vera Golian** (*Kharkiv National University of Radio Electronics, Ukraine*)

Synthesis of a VHDL-model of Gas Discharge Circuit of Gas Laser

**14:45 - 15:00****Vitalii Martovytskyi** (*Kharkiv National University of Radio Electronics, Ukraine*)

Identification in Informative Systems on the Basis of Users' Behaviour

**15:00 - 15:15****Vitalii Martovytskyi** (*Kharkiv National University of Radio Electronics, Ukraine*)

Efficiency of Image Convolution

**15:15 - 15:30****Maryna Kudriavtseva** (*Kharkiv National University of Radio Electronics, Ukraine*)

Personalized Adaptation of Learning Environments

**15:30 - 15:45****Andrei Statkus** (*National Technical University "Kharkiv Polytechnic Institute", Ukraine*)

Nonlinear Wave Dynamics of Unstable Atherosclerotic Plaque

**15:45 - 16:00****Andriy Yerokhin** (*Kharkiv National University of Radio Electronics, Ukraine*)

Adaptive Decision-Making for Robotics Task

**16:30 - 17:30**  
Coffee/Tee Break CAOL Poster Session II**16:30 - 17:30**  
Coffee/Tee Break DSMOLE Poster Session**18:00 - 21:00 Welcome Party**

## Saturday, September 7, 2019

08:00 - 9:00 Registration and Accommodation (Lobby, Hotel "Military Marine Club")

09:00 - 10:30 CAOL/ DSMOLE/UM Plenary Joint III (Cinema Hall, Hotel "Military Marine Club")

Chair: Edik Rafailov (Aston University, Birmingham, UK)

09:00 - 09:30 (Invited)

**Ignacio Lira** (Pontificia Universidad Católica de Chile)

Monte Carlo Evaluation of the Uncertainty in a Calibrated Instrument

09:30 - 10:00 (Invited)

**Liam O'Faolain** (Cork Institute of Technology, Ireland)

Hybrid Lasers Using CMOS Compatible Nanostructures

10:00 - 10:30 (Invited)

**Pere Perez Millan** (FYLA Laser, Valencia, Spain)

Ultra-High Frequency and Ultra-Short Pulsewidth Optical Fiber Lasers

### 10:30 - 10:45 General Photography

10:45 - 11:30 Coffee/Tee Break CAOL Poster Session III

11:30 - 13:30 CAOL Plenary IV (Cinema Hall, Hotel "Military Marine Club")

Chair: Philippe Roy (XLIM CNRS-University of Limoges, France)

11:30 - 12:00 (Invited)

**Grigori Sokolovskii** (Ioffe Physical-Technical Institute, Russian Academy of Sciences, Russia)

Quantum Cascade Lasers in Mid-Infrared and THz Range

12:00 - 12:30 (Invited)

**Irmantas Kašalynas** (THz Photonics Laboratory, Center for Physical Sciences and Technology, Lithuania)

Laser-Processed Diffractive Optics for Terahertz Waves

12:30 - 13:00 (Invited)

**Mikhail Vasnetsov** (Institute of Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine)

Luminescence of Polyamide-6 A and G forms

13:00 - 13:30 (Invited)

**Sergey Prosvirnin** (Institute of Radio Astronomy, National Academy of Sciences of Ukraine, Kharkiv, Ukraine)

Bistable Properties of Nonlinear Planar Metamaterials

11:30 - 13:15 UM, Scientific Workshop

(Small Hall 2, Hotel "Military Marine Club")

Chair: Igor Zakharov, Kharkiv National University of Radio Electronics, Ukraine

11:30 - 12:00 (Invited)

**Sergey Shary** (Institute of Computational Technologies, SB Russian Academy of Sciences, Novosibirsk, Russia)

Interval Methods for Data Fitting under Imprecision and Uncertainty

12:00 - 12:30 (Invited)

**Igor Zakharov** (Kharkiv National University of Radio Electronics, Ukraine)

Revision GUM: The Suggested Algorithm for Processing Measurement Results

12:30 - 12:45

**Igor Pototskiy** (SE "Ukrmetrteststandard", Kyiv, Ukraine)

Theoretical Substantiation and Application of CUSUM-charts

12:45 - 13:00

**Artur Zaporozhets** (Igor Sikorsky Kyiv Polytechnic Institute, Ukraine)

Metrological Assessment of the Indirect Method of Measuring the Concentration of Oxygen in the Air

13:00 - 13:15

**Yevhen Poliakov** (Kharkiv National Automobile and Highway University, Ukraine)

Influence of Measurements Uncertainty on Uncertainty of Gilbert-Huang Transform Modes

### 13:30 - 14:30 Lunch

#### CAOL Session III

(Cinema Hall, Hotel "Military Marine Club")

14:30 - 16:15

**INTEGRATED OPTICS,**

**NANOPHOTONICS, PLASMONICS**

Chair: **Sergey Tarapov**, O.Ya. Usikov Institute for Radiophysics and Electronics, National Academy of Sciences of Ukraine, Ukraine

14:30 - 15:00 (Invited)

**Iaroslav Gnilitskiy** (Lviv Polytechnic National University, Ukraine)

Highly Regular Laser-Induced Periodic Nanostructures: Physical Origin, Atomistic Modelling and Industrial Applications

#### CAOL Session IV

(Small Hall 1, Hotel "Military Marine Club")

14:30 - 16:15

**BIOPHOTONICS AND LASER**

**MEDICINE (II)**

Chair: **Inna Plastun**, Yuri Gagarin State Technical University of Saratov, Russia

14:30 - 14:45

**Petro Chechin** (The Filatov Institute of Eye Diseases and Tissue Therapy, NAMS of Ukraine, Odessa, Ukraine)

Laser Treatment of Pigment and Pigmentless Tumors of the Iris

#### UM, Scientific Workshop

(Small Hall 2, Hotel "Military Marine Club")

14:30 - 16:00

**MEASUREMENT UNCERTAINTY: SCIENTIFIC, NORMATIVE, APPLIED AND METHODOLOGICAL ASPECTS**

Chair: **Igor Zakharov**, Kharkiv National University of Radio Electronics, Ukraine

14:30 - 14:45

**Larysa Kosheva** (National Aviation University, Kyiv, Ukraine)

Approaches to the Evaluation of Conformity Taking into Account the Uncertainty of the Value of the Monitored Parameter

15:00 - 15:15

**Oleksandr Akhmerov** (*Scientific Research Institute of Physics, Odessa I.I. Mechnikov National University, Ukraine*)  
Spectral Sensitization with Dyes of Heterophase Microsystems "Nucleus - Silver Halide Shell"

15:15 - 15:30

**Yuri Morozov** (*Kotelnikov Institute of Radioengineering and Electronics, (Saratov Branch), Russian Academy of Sciences, Saratov, Russia*)  
Difference-Frequency Generation in the Cavity of a Dual-Wavelength Semiconductor Disk Laser: Effect of Absorption of the Short-Wave-length Radiation in the "Long-Wavelength" Active Region on the Operation Point Stability

15:30 - 15:45

**Yuriy Zholudov** (*Kharkiv National University of Radio Electronics, Kharkiv, Ukraine*)  
Generation of Fluorescent Nanoparticles by Laser Fragmentation Technique for Electrochemiluminescent Assay

15:45 - 16:00

**Svitlana Ilchenko** (*International Center "Institute of Applied Optics", National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
Types of Angular Resonances for Multilayer Structures under Illumination in Total Internal Reflection

16:00 - 16:15

**German Telbiz** (*L.V. Pisarzhevsky Institute of the Physical. Chemistry, National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
Lasing of the Rhodamine 6G in the Planar Waveguides Formed from Thin Hybrid Films of the Silica and Titania

14:45 - 15:00

**Natalija Konovalova** (*The Filatov Institute of Eye Diseases and Tissue Therapy, NAMS of Ukraine, Odessa, Ukraine*)  
To the Treatment of Anterior Uveitis

15:00 - 15:15

**Olga Guzun** (*The Filatov Institute of Eye Diseases and Tissue Therapy, NAMS of Ukraine, Odessa, Ukraine*)  
Changes of Intraocular Pressure and Ocular Hemodinamics in Patients with Neovascular Glaucoma after Transscleral Laser Cyclocoagulation

15:15 - 15:30

**Sergii Guzun** (*Filatov Institute of Eye Diseases and Tissue Therapy, NAMS of Ukraine, Odessa, Ukraine*)  
The Efficacy of Laser Stimulation and Nutrient Therapy in the Treatment of Accommodative Asthenopia in Students with Autonomic Dysfunction

15:30 - 15:45

**Nataliya Khramenko** (*Filatov Institute of Eye Diseases and Tissue Therapy, NAMS of Ukraine, Odessa, Ukraine*)  
Laser Stimulation of Retina and Optic Nerve in Children with Anisometropic Amblyopia

15:45 - 16:15 (Invited)

**Anatolii Korobov** (*V.N.Karazin Kharkiv National University, Ukraine*)  
Photomedicine and Its Place in Medicine of the 21th Century

14:45 - 15:00

**Tayiana Vladimirova** (*Northern (Arctic) Federal University, Archangelsk, Russia*)  
Uncertainty Evaluation of Ultrasonic Flow Transducer Measurements

15:00 - 15:15

**Sergii Shevkun** (*SE" Ukrmetrteststandard", Kyiv, Ukraine*)  
Automation of Processing of Measurement Results of Parameters of Precision Frequency Measures

15:15 - 15:30

**Olga Ivanets** (*National Aviation University, Kyiv, Ukraine*)  
Approach to the Evaluation of the Functional State of the Human Body Taking into Account the Variability of Medical and Biological Indicators

15:30 - 15:45

**Iryna Morozova** (*National Aviation University, Kyiv, Ukraine*)  
Approach to Assessing Quality Indicators

15:45 - 16:00

**Oleksandr Degtiarov** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Development of the Theoretical Basis of Magnetic Measurement Uncertainty Evaluation

16:00 - 17:00 Poster Session UM\*2019

## Excursion

### Sunday, September 8, 2019

08:00 - 9:00 Registration and Accommodation (Lobby, Hotel "Military Marine Club")

09:00 - 11:00 CAOL Plenary V (Cinema Hall, Hotel "Military Marine Club")

Chair: Grigorii Sokolovskii (*loffe Physical-Technical Institute, Russian Academy of Sciences, Russia*)

09:00 - 09:30 (Invited)

**Fedor Sizov** (*V.E. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
THz and IR Detectors in Applications

09:30 - 10:00 (Invited)

**Sergey Tarapov** (*O.Ya. Usikov Institute for Radiophysics and Electronics, National Academy of Sciences of Ukraine, Ukraine*)  
Experimental Implementation of Non-Uniformity Effects in Artificial Media

10:00 - 10:30 (Invited)

**Victor Kotlyar** (*Image Processing Systems Institute, Russian Academy of Sciences, Samara, Russia*)  
Asymmetric and Astigmatic Laser Beams with Orbital Angular Momentum

10:30 - 11:00 (Invited)

**Alexander Glova** (*State Research Center of Russian Federation Troitsk Institute for Innovation and Fusion Research, Russia*)  
Laser Cutting of the Materials in Presence of Oil Flame

11:00 - 11:45 Coffee/Tee Break CAOL Poster Session IV

**CAOL Session V**  
(Small Hall 1)

**11:45 - 13:30**  
**RESONATORS AND  
BEAM PROPAGATION**

**Chair:** **Vyacheslav Maslov**, *V.N.Karazin Kharkiv National University, Ukraine*

**11:45 - 12:15 (Invited)**

**Dmitry Vysotsky** (*State Research Center of Russian Federation Troitsk Institute for Innovation and Fusion Research, Russia*)  
Semi-Vectorial Optical Model of Quantum-Cascade Laser

**12:15 - 12:30**

**Aleksandr Shulga** (*Belarusian-Russian University, Mogilev, Belarus*)  
Generation of Radially Polarized Beams by Intracavity Waveguide Technique

**12:30 - 12:45**

**Victor Taranenko** (*International Center "Institute of Applied Optics", National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
Super-Collimation by Circular Grating near Mirror

**12:45 - 13:00**

**Pavel Romanov** (*Active Optics NightN Ltd., Moscow, Russia*)  
Focusing Laser Beam Through Pinhole Using Bimorph Deformable Mirror

**13:00 - 13:15**

**Ruslan Lymarenko** (*International Center "Institute of Applied Optics", National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
Multilayer Dielectric Structure for Mode Selection of Wide-Aperture Laser

**13:15 - 13:30**

**Oleksandr Ostroukh** (*International Center "Institute of Applied Optics", National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
Model of Wide-Aperture Laser with Intracavity Diffractive Element

**CAOL Session VI**  
(Small Hall 2)

**11:45 - 13:15**  
**NONLINEAR OPTICS AND  
PHOTONICS, QUANTUM OPTICS**

**Chair:** **Sergey Prosvirnin**, *Institute of Radio Astronomy, National Academy of Sciences of Ukraine, Kharkiv, Ukraine*

**11:45 - 12:15 (Invited)**

**Sergei Roshchupkin** (*Peter the Great St. Petersburg Polytechnic University, St-Petersburg, Russia*)  
New Aspects of Resonant Effects in Laser-Modified Quantum Electrodynamics Processes

**12:15 - 12:30**

**Efim Khazanov** (*Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia*)  
Nonlinear Compression of Ultra-High-Power Laser Pulses Information on Submission

**12:30 - 12:45**

**Yevhen Makovetskyi** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Modeling of Evolution of Diffraction Patterns from Light-Induced Gratings in AgCl-Ag Waveguide Films

**12:45 - 13:00**

**Aleksandr Dubov** (*Peter the Great St. Petersburg Polytechnic University, St-Petersburg, Russia*)  
Spontaneous Bremsstrahlung of Ultrarelativistic Electrons within the Resonant Conditions in the Field of a Nucleus and External Electromagnetic Field

**13:00 - 13:15**

**Andrey Tarasov** (*Kotelnikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia*)  
Effect of Ag, Cu, and Co Underlayers on Luminescence and Lasing of Vapor-Phase-Grown ZnO Microcrystals

**13:30 - 14:30 Lunch**

**CAOL Session VII**  
(Small Hall 1)

**14:30 - 16:00**  
**LASER MATERIAL PROCESSING,  
OPTICAL MEASUREMENTS**

**Chair:** **Alexander Glova**, *State Research Center of Russian Federation Troitsk Institute for Innovation and Fusion Research, Russia*

**14:30 - 14:45**

**Rinad Seidgazov** (*ILIT RAS-Branch of FSRC "Crystallography and Photonics" Russian Academy of Sciences, Shatura, Russia*)  
Analysis of the Main Hydrodynamic Mechanisms in Laser Induced Keyhole Welding

**14:45 - 15:00**

**Iurii Minin** (*Skolkovo Institute of Science and Technology, Moscow, Russia*)  
Development and Investigation of Precision Laser-Interferometric Meter for Distance and Displacement Monitoring

**15:00 - 15:15**

**Serhii Yefymenko** (*Kharkiv National University of Radio Electronics, Ukraine*)  
The Possibility of Using the Concept of Colorimetric Functions in Applied Research

**15:15 - 15:30**

**Maxim Khomenko** (*ILIT RAS-Branch of FSRC "Crystallography and Photonics", Russian Academy of Sciences, Shatura, Russia*)  
On Validation of Hydrodynamic Model of Selective Laser Melting with the Effect of the Evaporation

**15:30 - 15:45**

**CAOL Session VIII**  
(Small Hall 2)

**14:30 - 16:00**  
**THZ PHOTONICS AND  
ELECTRONICS**

**Chair:** **Fedir Sizov**, *V.E. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*

**14:30 - 14:45**

**Petro Artemchuk** (*Taras Shevchenko National University of Kyiv, Ukraine*)  
A Resonance-Type Terahertz-Frequency Signal Detector Based on an Antiferromagnetic Tunnel Junction

**14:45 - 15:00**

**Vadym Korotyeyev** (*V.E. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*)  
Full-Mode Analysis of the Plasmon Oscillations of 2D Electron Gas Subjected to Electric Field

**15:00 - 15:15**

**Vladislav Senyuta** (*V.N. Karazin Kharkiv National University, Ukraine*)  
CW Terahertz Laser Emitting Beams with Nonuniform Spatial Polarization

**15:15 - 15:30**

**Mykola Dubinin** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Focusing of Modes for Dielectric Resonator of a Terahertz Laser

**15:30 - 15:45**

**Mykhailo Reznikov** (*Taras Shevchenko National University of Kyiv, Ukraine*)  
Effect of Amplified Spontaneous Emission on Fiber Span in Backward

**Elena Tverytnykova** (*National Technical University "Kharkiv Polytechnic Institute", Ukraine*)

Improving the Accuracy of the Laser Control System

**15:45 - 16:00**

**Konstantin Muntean** (*V.N.Karazin Kharkiv National University, Ukraine*)

Calibration of Iso-peribolic Calorimeter by Using Transient Time Constants

Pumped Raman Amplifier

**15:45 - 16:00**

**Ihor Virt** (*Drogobych Ivan Franko State Pedagogical University, Ukraine*)

Properties of ZnCoO thin films obtained by a pulsed laser deposition method

**16:00 - 17:00** Coffee/Tee Break CAOL Poster Session V

**17:00 - 17:30** Closing Ceremony

**18:00** Gala Dinner

## POSTER REPORTS

**Friday, September 6, 2019**

**10:45 - 11:30** CAOL Poster Session I

**Chair: Andrey Degtyarev**, *V.N. Karazin Kharkiv National University, Ukraine*

- 1) **Galyna Oleksiienko** (*Sumy State University, Ukraine*)  
Formation of Space Charge Wave with Wide Frequency Spectrum in Helical Electron Beam of Two-Stream FEL Transit Section with Longitudinal Electric Field
- 2) **Oleksandr Hnatenko** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Laser System for Recording Optics
- 3) **Oleksandr Hnatenko** (*Kharkiv National University of Radio Electronics, Ukraine*)  
1,55 mkm Fiber Laser with Electronic Controlled Mode-Locking
- 4) **Yuriy Kurskoy** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Topological Model of Laser Emission Parameters Research
- 5) **Yuriy Kurskoy** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Laser Emission of Dye Solutions Co-doped with Silver Nanoparticles
- 6) **Liudmyla Derzhypolska** (*Institute of Physics, National Academy of Science, Kyiv, Ukraine*)  
Peculiarities of Propagation and Long Distance Focusing of Expanded Gaussian Laser Beams
- 7) **Slavomir Anufrick** (*Yanka Kupala State University of Grodno, Belarus*)  
Ablation Treatment of Dental Tissue by 530 nm and 353 nm Radiation
- 8) **Slavomir Anufrick** (*Yanka Kupala State University of Grodno, Belarus*)  
Method of Modeling of XeCl Excilamps with Barrier Discharge on the Basis HCl Halogen Donors
- 9) **Anastasia Natarova** (*Ivan Kozhedub Kharkiv National Air Force University, Kharkiv, Ukraine*)  
Physical Methods of Analysis of the Human Hair Properties
- 10) **Mykola Kokodii** (*V.N. Karazin Kharkiv National University, Kharkiv, Ukraine*)  
Local Laser Heating of Biological Tissue
- 11) **Iuliia Ielchishcheva** (*V.N. Karazin Kharkiv National University, Kharkiv, Ukraine*)  
The Influence of Coherent Monochromatic and Non-monochromatic Electromagnetic Radiation on the Human Brain Rhythms
- 12) **Tamara Kamneva** (*V.N. Karazin Kharkiv National University, Kharkiv, Ukraine*)  
A Study of the Impact of Radiation of the Photon Matrix on Energy-Informational Components of the Students' Body
- 13) **Andriy Degtyarev** (*V.N. Karazin Kharkiv National University, Kharkiv, Ukraine*)  
The Influence of Terahertz and Middle-Infrared Laser Radiation on the Membrane-Dependent Properties of Rats' Red Blood Cells
- 14) **Aleksander Levchenko** (*V.N. Karazin Kharkiv National University, Kharkiv, Ukraine*)  
Effect of Low Intensity Laser Irradiation as Well as Visible and Infra-Red Polarized Irradiation on Rat Liver Mitochondria
- 15) **Alexander Levchenko** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Laser-controlled Interaction of Cytochrome c with Lipids May Not Disrupt Apoptotic Pathway

- 16) **Vladimir Fedorov** (*Kharkiv National Medical University, Ukraine*)  
Experience of Phototherapy Application in Treatment of Osteoarthritis in Patients with Diabetes Mellitus
- 17) **Pavlo Virych** (*Taras Shevchenko National University of Kyiv, Ukraine*)  
Nanocomposites Polymer/Gold Nanoparticles/Chlorin e6 for Antitumor Laser Medicine

**16:30 – 17:30 CAOL Poster Session II**

**Chair: Ievgen Brytavskiy, Odessa I.I. Mechnikov National University, Ukraine**

- 1) **Fikret Mirzade** (*ILIT RAS-Branch of FSRC "Crystallography and Photonics" Russian Academy of Sciences, Shatura, Russia*)  
A Phase Field Formulation of the Coupled Effects of Defect Generation and Large Strains on Microstructure Evolution During Laser-Based Additive Manufacturing
- 2) **Fikret Mirzade** (*ILIT RAS-Branch of FSRC "Crystallography and Photonics" Russian Academy of Sciences, Shatura, Russia*)  
On the Self-Organization of Coupled Temperature-Strain Surface Periodic Structures on an Anisotropic Laser-Excited Half Space
- 3) **Anastasiya Sitkevich** (*Yanka Kupala State University of Grodno, Belarus*)  
Steam and Gas Plume Evolution During Laser Treating of Metals in Liquid
- 4) **Anastasiya Sitkevich** (*Yanka Kupala State University of Grodno, Belarus*)  
Generation of Particles During Laser Treating of Metal in External Electric Field
- 5) **Illia Balashov** (*NII Laser Technology PJSC, Kharkiv, Ukraine*)  
Laser Marking System for Plastic Products
- 6) **Stanislav Pogorelov** (*National University of Pharmacy, Kharkiv, Ukraine*)  
The Stabilization of the Bolometer's Heat-Exchange Coefficient with the Environment
- 7) **Hristiana Nikolova** (*Technical University of Sofia, Bulgaria*)  
Laser Measurement System with the Laser Beam Instability Compensation

**16:30 – 17:30 DSMOLE Poster Session**

**Chair: Andriy Yerokhin, Kharkiv National University of Radio Electronics, Ukraine**

- 1) **Oleh Zolotukhin** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Synthesis of Semantic Model of Subject Area at Integration of Relational Databases
- 2) **Nataliya Bilous** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Configurable Cell Segmentation Solution Using Hough Circles Transform and Watershed Algorithm
- 3) **Valerii Semenets** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Computed Tomography Dataset Analysis for Stereotaxic Neurosurgery Navigation
- 4) **Victoriya Usik** (*National Technical University "Kharkiv Polytechnic Institute", Ukraine*)  
Features of Using Optoelectronic Alignment Amplifiers in Industrial Control Systems
- 5) **Anastasia Natarova** (*Ivan Kozhedub Kharkiv National Air Force University, Kharkiv, Ukraine*)  
The Use of the Solid-State Plasma-based Material for the Protection of Radio-Electronic Means of Laser Emission
- 6) **Alina Shafronenko** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Wavelet Analysis and Decomposition Into Color Spaces in Researching of Human Fluorescently Labeled Images Tissues

**Saturday, September 7, 2019**

**10:45 – 11:30 CAOL Poster Session III**

**Chair: Andrey Degtyarev, V.N. Karazin Kharkiv National University, Ukraine**

- 1) **Olena Chala** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Impact of Technological Operations Parameters on Moems Components Formation
- 2) **Serhiy Malynych** (*Hetman Petro Sahaidachny National Army Academy, Lviv, Ukraine*)  
Tunable Color Filter Based on Optomechanical Plasmonic Device
- 3) **Victor Kotlyar** (*Image Processing Systems Institute, Russian Academy of Sciences, Samara, Russia*)  
Toroidal and Reverse Flux of Light in The Sharp Focus
- 4) **Aisylyu Kamaliev** (*ITMO University, St. Petersburg, Russia*)  
Monolayer of Plasmonic Nanolaser: a Study of Spasing Regime and Polarization Characteristics
- 5) **Dmytro Demianenko** (*Zaporizhzhya National Technical University, Ukraine*)  
The Long-Wavelength Surface Plasmons in the Single-Wall Carbon Nanotubes with the Elliptic Cross Section
- 6) **Nadiia Stognii** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Modeling the Electromagnetic Wave Diffraction on Conical Gratings Consisting of Zero-Thickness PEC Strips



- 7) **Nadiia Stognii** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Mathematical Modelling of Impulse Excitation of a Superwideband PEC Cone Antenna
- 8) **Illia Fedorin** (*National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine*)  
Peculiarities of Wave Surface of a Semiconductor-Dielectric Metamaterial
- 9) **Volodymyr Fitio** (*Lviv Polytechnic National University, Ukraine*)  
Diffraction of Gaussian Laser Beam with Finite Cross-Section on a Grating Using RCWA
- 10) **Aleksey Girich** (*O.Ya. Usikov Institute for Radiophysics and Electronics, National Academy of Science of Ukraine, Kharkiv, Ukraine*)  
Spectral Features of a Multi-Periodical Metamaterials
- 11) **Lali Kalandadze** (*Batumi Shota Rustaveli State University, Georgia*)  
Experimental and Theoretical Investigation of the Optical Properties of Nano nickel Films
- 12) **Yaroslav Lepikh** (*Odessa I.I. Mechnikov National University, Ukraine*)  
Photoluminescence of SnO<sub>2</sub> nanoparticle ensemble in porous glass with column structure
- 13) **Nadezhda Yeliseyeva** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Radiation Patterns of Monopole Nano-Antenna Placed on Finite Size Metal Screen
- 14) **Pavlo Virych** (*Taras Shevchenko National University of Kyiv, Ukraine*)  
Silver Nanoparticles-based Hydrogel for Potential Antibacterial Applications
- 15) **Pavlo Virych** (*Taras Shevchenko National University of Kyiv, Ukraine*)  
Differences in the Vibrational Spectra of MoS<sub>2</sub> Nanoparticles and Microcrystallites, the Manifestation of Nonlinear Resonant Wave Processes
- 16) **Oksana Sychova** (*Kharkiv National University of Radio Electronics, Ukraine*)  
The Autoconvolution Method Use for Positioning Photonic Crystal Fibers
- 17) **Roman Voliansky** (*Dniprovsk State Technical University, Kamyanske, Ukraine*)  
Chaotic Communications in the Coupled Fiber Optic System

**16:15 – 17:00 UM Poster Session**

**Chair: Igor Zakharov, Kharkiv National University of Radio Electronics, Ukraine**

- 1) **Yuri Pahomov** (*Kharkiv National University of Urban Economy, Ukraine*)  
The Microwave Oven Thermal Field Uniformity Increasing by Using Powermeter
- 2) **Nataliia Klochko** (*Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine*)  
Evaluation of Measurement Uncertainty for Calibration the Domestic Gas Meters
- 3) **Tatiana Vladimirova** (*Northern (Arctic) Federal University, Archangelsk, Russia*)  
The Uncertainty of Measuring the Weight of the Human Body Impacted to Physical Activity on the Example of Nordic Walking
- 4) **Khrystyna Shynkaruk** (*Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine*)  
Metrological Study of the Operation of a Thermocatalytic Converter under the Conditions of Measuring the Combustion Heat of Natural Gas
- 5) **Lidiya Vytvytska** (*Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine*)  
Analysis of the Reliability of Determining the Indicators of the Vessels State of the Person's Lower Limbs Based on Noise Thermometry
- 6) **Orest Serediuk** (*Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine*)  
Evaluation of Unauthorized at the Express-Control of Heating of Natural Gas
- 7) **Olha Hoda** (*National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine*)  
The Methods of Uncertainty Evaluation under Measurement of Quality Characteristics with Hierarchical Structure
- 8) **Oleg Zaporozhets** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Using Artificial Neural Network for Compensation of Semiconductor Thermistor Nonlinearity
- 9) **Andrii Korobko** (*Leonid Pogorilyy UkrNDIPVT, Kyiv region, Ukraine*)  
Measurement Uncertainty as a Test Model Assessment Tool
- 10) **Igor Zakharov** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Adaptation of the Least Squares Method for Determination of Oscillating Type Measuring Devices Parameters with Using Gain-Frequency Characteristic
- 11) **Roman Trishch** (*Ukrainian Engineering and Pedagogical Academy, Kharkiv, Ukraine*)  
Development and Validation of Measurement Techniques According to ISO/IEC 17025:2017
- 12) **Ortagoli Khakimov** (*Scientific Research Institute of Standardization, Certification and Technical Regulation of the Agency "Uzstandard", Tashkent, Uzbekistan*)  
Evaluation of Ultrasound Reflection Coefficient Measurement Result and its Uncertainty by the Method of Linearization

- 13) **Maryna Serhiienko** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Assessment of the Uncertainty of Measurements under Determining the Temperature Parameters of Milk Proteins Coagulation
- 14) **Vyacheslav Kuzovyk** (*National Aviation University, Kyiv, Ukraine*)  
Establishment of Reference Intervals Blood Parameters Wintering Operators Based Measurement Uncertainty
- 15) **Tetiana Chunikhina** (*National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine*)  
The Measurement Uncertainty Analysis of the Oil Concentration in the Sunflower Seed
- 16) **Narine Gurdzhian** (*ISMA, National Academy of Sciences of Ukraine, Kharkiv, Ukraine*)  
Evaluation of Uncertainty Measurement of Radionuclides Minimum Detectable Activity in Large Plastic Scintillators

**Sunday, September 8, 2019**

**11:00 – 11:45 CAOL Poster Session IV**

**Chair: Ievgen Brytavskiy, Odessa I.I. Mechnikov National University, Ukraine**

- 1) **Petro Trokhimchuck** (*Lesya Ukrainka Eastern European University, Lutsk, Ukraine*)  
Some Problems of Modeling the Shock Processes of Relaxed Optics
- 2) **Vyacheslav Maslov** (*O.Ya. Usikov Institute for Radiophysics and Electronics, National Academy of Science of Ukraine, Kharkiv, Ukraine*)  
Impact of Relaxation Processes on Features of Laser Dyes
- 3) **Alexander Levchenko** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Thermal Annealing Free Radicals in  $\gamma$ -Irradiated KDP and DKDP Crystals
- 4) **Anatoliy Andrushchak** (*Lviv Polytechnic National University, Ukraine*)  
The Optimal Geometry of the Acousto-optic Interaction in Selected Crystalline Materials Determined by Extreme Surfaces Method
- 5) **Marina Zykova** (*Dmitry Mendeleev University of Chemical Technology of Russia, Moscow, Russia*)  
Organo-Inorganic Luminescent Hybrid Materials Based on Lead Fluoride and Organic Phosphors
- 6) **Marina Zykova** (*Dmitry Mendeleev University of Chemical Technology of Russia, Moscow, Russia*)  
Effect of the Accidental Impurities onto the Absorption Spectrum of  $\text{NaGd}(\text{WO}_4)_2$  Laser Crystal
- 7) **Olena Vovk** (*Institute for Single Crystals, National Academy of Science of Ukraine, Kharkiv, Ukraine*)  
Czochralski Growth and Characterization of  $\text{Er}^{3+}, \text{Yb}^{3+}:\text{YCa}_4\text{O}(\text{BO}_3)_3$  Single Crystals
- 8) **Mykhailo Kirichenko** (*National Technical University "Kharkiv Polytechnic Institute", Ukraine*)  
Influence of Functional Layers Thickness on CdTe Based Flexible Solar Cells Efficiency
- 9) **Svitlana Bugaychuk** (*Institute of Physics, National Academy of Science of Ukraine, Kyiv, Ukraine*)  
Method of Controlling the Micro- and Nanoscale Displacements Based on Optical Correlation
- 10) **Yaroslav Lepikh** (*Odessa I.I. Mechnikov National University, Ukraine*)  
Processing of Image in Optical and X-Ray Radiartion Range by the Sensor Based on Nonideal Heterojunction
- 11) **Olga Shpachenko** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Raman Lidar for Monitoring Gas Composition of the Atmosphere Ground Layer
- 12) **Sergiy Novoselov** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Development of the Anisotropic Filtration Method for Automated Recognition of Authenticity of Banknotes by their Images
- 13) **Leonid Kupchenko** (*Ivan Kozhedub Kharkiv National Air Force University, Kharkiv, Ukraine*)  
Active Electro-Optical System with Dynamic Spectral Processing of Optical Radiation
- 14) **Liubomyr Ropyak** (*Ivano-Frankivsk National Technical University of Oil and Gas, Ukraine*)  
Machining Error Influence on Stress State of Conical Thread Joint Details

**16:00 – 17:00 CAOL Poster Session V**

**Chair: Andrey Degtyarev, V.N. Karazin Kharkiv National University, Ukraine**

- 1) **Valentyn Lymar** (*V.N. Karazin Kharkiv National University, Ukraine*)  
Threshold Behavior of Convective Flows at Thermal Lens Oscillations
- 2) **Alexandr Gnatenko** (*Kharkiv National University of Radio Electronics, Ukraine*)  
Airy Pulse Transformation by an Accelerated Medium Boundary
- 3) **Valerii Semenets** (*Kharkiv National University of Radio Electronics, Ukraine*)  
On the Theory of a Pulse Microwave-Pumped Laser
- 4) **Andrii Sizhuk** (*Taras Shevchenko National University of Kyiv, Ukraine*)  
Spatial Inhomogeneity of the Absorption and Re-Emission Properties of an Optically Active Medium in a Resonator

- 5) **Pavel Romanov** (*Active Optics NightN Ltd., Moscow, Russia*)  
Wide-Aperture Deformable Mirrors for Wavefront Distortions Compensation in High-Power Laser Complexes
- 6) **Andrii Riazantsev** (*Volodymyr Dahl East Ukrainian National University, Severodonetsk, Ukraine*)  
Differential Operator Formalism for Axial Optical Vortex Beam and the Double-Phase-Ramp Converter
- 7) **Alexander Kuzmenko** (*International Center "Institute of Applied Optics", National Academy of Science of Ukraine, Kyiv, Ukraine*)  
Phase Diffractive Optical Element for the Beam Shaping in the Intracavity of a Microchip Laser
- 8) **Victor Kotlyar** (*Image Processing Systems Institute, Russian Academy of Sciences, Samara, Russia*)  
Hermite-Gaussian beams with orbital angular momentum
- 9) **Olga Sulymenko** (*Taras Shevchenko Kyiv National University, Ukraine*)  
Terahertz-Frequency Spin Hall Oscillators for Logic Operations
- 10) **Vyacheslav Maslov** (*V.N.Karazin Kharkiv National University, Ukraine*)  
Using of Conical Mirrors in Terahertz Lasers
- 11) **Vyacheslav Maslov** (*V.N.Karazin Kharkiv National University, Ukraine*)  
Improving Focusing Properties of Gradient Annular Metal Gratings of Terahertz Range