

I3S
2022

**9th International Symposium
on Sensor Science**

20–22 June 2022, Warsaw, Poland



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I3S
2022

9th International Symposium on Sensor Science

The Centre for Advanced Materials and Technologies (CEZAMAT)
Warsaw University of Technology
Warsaw, Poland
20 – 22 June 2022

Conference Chairs

Associate Professor Piotr Lesiak
Professor Tomasz Woliński
Professor Leszek R. Jaroszewicz

Organised by



**Warsaw University
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Welcome by Assoc. Prof. Piotr Lesiak, Prof. Tomasz Woliński, Prof. Leszek R. Jaroszewicz

Dear Colleagues,

It is with great pleasure that we announce the 9th International Symposium on Sensor Science, to be held in Warsaw, Poland, from 20 to 22 June 2022.

Sensor technology has been shown to be suitable for applications in many important fields, including industrial applications, security medical diagnostics, and environmental monitoring. This international conference, supported by the Photonics Society of Poland, Warsaw University of Technology as well MDPI Sensors, will bring together scientists from different areas to discuss important recent developments in sensor technology. It will represent a great opportunity for an in-person meeting of an interdisciplinary community aiming to discuss important breakthroughs in sensor technology and its related fields.

We look forward to your participation in this exciting event.

Assoc. Prof. Piotr Lesiak, Prof. Tomasz Woliński, Prof. Leszek R. Jaroszewicz
I3S2022 Conference Chairs



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CEZAMAT

WARSAW UNIVERSITY OF TECHNOLOGY



20 – 22 June 2022, Warsaw, Poland

	Sunday 19 June	Monday 20 June	Tuesday 21 June	Wednesday 22 June
Morning		Registration Opening ceremony <i>Plenary Session 1</i>	<i>Plenary Session 3</i>	<i>Plenary Session 5</i>
		Coffee Break	Coffee Break	Coffee Break
		<i>Regular Session 1: Chemical Sensors</i>	<i>Regular Session 3: Optical/Photonic Sensors and Sensor Applications</i>	<i>Regular Session 5: Optical/Photonic Sensors and SPECIAL SESSION. Specialty Optical Fibers for Sensing</i>
Afternoon		Lunch	Lunch	Coffee Break
	Registration	<i>Plenary Session 2</i> <i>Regular Session 2: Biosensors</i>	<i>Plenary Session 4</i> <i>Regular Session 4: Physical Sensors and SPECIAL SESSION. Materials, Microfluidics, Configurations and Strategies for Sensing</i>	<i>Regular Session 6: Optical/Photonic Sensors and SPECIAL SESSION. Specialty Optical Fibers or Sensing</i> Closing Ceremony
	Welcome Cocktail	<i>Poster Session</i>	Gala Dinner	Lunch

Sunday 19 June 2022: Registration 16:00 / **Welcome Cocktail 18:00**

Monday 20 June 2022: Registration 7:30 / 08:30 - 13:00 / 15:00 - 20:00

Tuesday 21 June 2022: 08:30 - 13:00 / 15:00 - 17:20 / **Gala Dinner 19:00**

Wednesday 22 June 2022: 08:30 - 14:30



Conference Program

Sunday 19 June 2022

18:00 **Welcome Cocktail**

Monday 20 June 2022

08:30–9:00 Opening ceremony

Plenary Session 1

Chair: **Tomasz Woliński**

9:00–9:45 **Abraham Katzir** “MID-IR Fiber Optic Sensors”

9:45–10:30 **Richard B. Jackman** “Nanostructured Plasmonic Diamond for Marine SERS”

10:30–11:00 **Coffee Break**

Regular Session 1

Chemical Sensors

Chair: **Artur Dybko**

11:00–11:20 **Artur Moro** “Fluorescent Ion Sensing: Using DPA-Based Chemosensors for Targeting Metal Cations and Anions”

11:20–11:40 **Larissa Egger** “Efficient Screening of Hybrid Nanomaterials for Optimizing Chemical Sensor Devices”

11:40–12:00 **Julia Kuczak** “Reference Electrodes with Polymeric Membranes Containing Ionic Liquids of Various Physicochemical Properties”

12:00–12:20 **Andrzej Peplowski** “Influence of the printing pastes' rheology on screen-printed electrochemical sensors' performance”

12:20–12:40 **Silvio Sciortino** “Timing performances and radiation hardness of 3D diamond detectors”

12:40–13:00 **Leonardo Bravo Thais** “Smart Insole Sensor for vGRF Measurement”

13:00–15:00 **Lunch**

Conference Program

Monday 20 June 2022

Plenary Session 2

Chair: **Dominik Dorosz**

15:00-15:40 **Elżbieta Malinowska** "Towards versatile bioanalytical systems"

Regular Session 2

Biosensors

Chair: **Dominik Dorosz**

15:40-16:00 **Artur Dybko** "Lab on paper sensor for explosive materials detection"

16:00-16:20 **Iwona Grabowska** "Electrochemical biosensors for cardiovascular diseases (CVDs) biomarkers detection"

16:20-16:40 **Bruno Wacogne** "Online Monitoring of T-cells growth: assessment of the concentration and quality, real time detection of contamination"

16:40-17:00 **Mateusz Słowikowski** "SMART-BED – non-invasive system for monitoring heart and respiratory rate"

17:00-17:20 **Gloria Jimenez Miranda** "Er3+ wireless temperature sensor for hyperthermia treatment"

18:00-20:00 **Poster Session**

Tuesday 21 June 2022

Plenary Session 3

Chair: **Leszek R. Jaroszewicz**

8:30-9:10 **Anna G. Mignani** "ERC – Funding opportunities for creative minds from Europe and anywhere in the world"

9:10-9:50 **Emmanuel Scorsone** "Diamond: a chemical sensor's best friend!"

9:50-10:30 **Yuliya Semenova** "Ultra-sensitive gas detection with microfibers and fiber microresonators"

10:30-11:00 **Coffee Break**

Conference Program

Tuesday 21 June 2022

Regular Session 3

Optical/Photonic Sensors and Sensor Applications

Chair: **Mirosław Karpierz**

- 11:00-11:20 **Mikhail Korpusenko** "Optical Studies of High Performance Predictable Quantum Efficient Detector Based on Induced-Junction Photodiodes Passivated with SiO₂/SiN_x"
- 11:20-11:40 **Stanisław Stopiński** "Optical gyroscope systems based on photonic integrated circuits"
- 11:40-12:00 **Ryszard Piramidowicz** "MIRPIC – integrated photonics platform for sensing applications"
- 12:00-12:20 **Marcin Kochanowicz** "1.5-2.1 um emission in rare-earth co-doped glasses and multicore optical fibers"
- 12:20-12:40 **Maciej Grzesiak** "Influence of geometrical parameters of nonlinear optical fibers on their optical properties."
- 12:40-13:00 **Romas Vijeikis** "Efficient Violence Detection in Surveillanc"

13:00-15:00 Lunch

Plenary Session 4

Chair: **Małgorzata Kujawińska**

- 15:00-15:40 **David D. Sampson** "Polarisation-sensitive optical coherence tomography – sensing order in the sub-wavelength biological world"

Regular Session 4

Physical Sensors and SPECIAL SESSION. Materials, Microfluidics, Configurations and Strategies for Sensing

Chair: **Małgorzata Kujawińska**

- 15:40-16:00 **Bernd Haehnlein** "Anisotropy of the delta-E effect in Ni-based magnetoelectric cantilevers: a finite element method analysis"

Conference Program

Tuesday 21 June 2022

- 16:00-16:20 **Wojciech Skierucha** "Selected issues on electromagnetic standardization of soil moisture"
- 16:20-16:40 **Ryszard Buczyński** "All-fiber polarization maintaining supercontinuum source with a highly nonlinear liquid core"
- 16:40-17:00 **Roberto Pizzoferrato** "Tuning the sensing properties of carbon dots for colorimetric detection of heavy metals in water"
- 17:00-17:20 **Piotr Lesiak** "Influence of optofluidic parameters of one-dimensional photonic structures on the reflection spectrum for the mid-infrared spectral region"

19:00 **Gala Dinner – The Hall of Faculty of Physics, Warsaw University of Technology (Koszykowa 75 Str.)**

Wednesday 22 June 2022

Plenary Session 5

Chair: **Piotr Lesiak**

- 8:30-9:10 **Shimshon Belkin** "Remote bio-detection of buried landmines by luminescent microbial sensors"
- 9:10-9:50 **Luigi Zeni** "Polymer optical fiber-based plasmonic biosensors for medical diagnostics"

9:50-10:20 **Coffee Break**

Regular Session 5

Optical/Photonic Sensors and SPECIAL SESSION. Specialty Optical Fibers for Sensing

Chair: **Luigi Zeni**

- 10:20-10:40 **Nitin Kumar Singh** "Electronic Versus Ionic Electroactive Polymers (EAPs) Strain Sensors for Wearable Electronics: A Comparative Study"
- 10:40-11:00 **Michał Nikodem** "Laser spectroscopy and gas sensing inside novel hollow core fibers"

Conference Program

Wednesday 22 June 2022

- 11:00-11:20 **Joanna Konopka** "A microsystem for vascularization study. 12:00-12:20"
- 11:20-11:40 **Kinga Żołnacz** "Twisted microstructured fiber with core created by partially open rings of holes for bend sensing"
- 11:40-12:00 **Aleksandra Dzieniszewska** "The color-polarization filter array (CPFA) sensors to recognize skin lesions"

12:00-12:30 Coffee Break

Regular Session 6

Optical/Photonic Sensors and SPECIAL SESSION. Specialty Optical Fibers for Sensing

Chair: **Tomasz Woliński**

- 12:30-12:50 **Grzegorz Dudzik** "Solid-State Laser Intra-Cavity Photothermal Sensor (SLIPS) for gas detection with parts-per-billion sensitivity"
- 12:50-13:10 **Roman Yatskiv** "Temperature sensing down to 4 K with erbium-doped tellurite glasses"
- 13:10-13:30 **Dominik Korol** "Polypyrrole-based molecularly imprinted nanoparticles for the chemosensing of oestriol"
- 13:30-13:50 **Joao Avo** "Nanomaterials with thermally-activated delayed fluorescence for sensing and imaging: challenges and solutions"
- 13:50 -14:10 **Lakshmi Devi Chakkarapani** "Poly(methylene blue)-Film Coated Carbon and MWCNTs Screen Printed Electrodes for Tyramine Detection"
- 14:10-14:30 **Closing Ceremony**

14:30 Lunch

Poster session (Mon, 18:00-20:00)



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- P1. Marko Boskovic** Humidity and CO2 sensing by graphene film based sensor obtained by liquid phase exfoliation
- P2. Francesco Arcadio** Plasmonic Sensors based on Plastic Light-Diffusing Fibers
- P3. Maciej Cieplak** Molecularly imprinted polymer based capacitive chemosensor for determination of heterocyclic aromatic amines in food samples
- P4. Christine Bauer** Detection of Foreign Items in Laundry Industry – a Dual Energy XRT approach
- P5. Szymon Baczyński** Novel, electrically-controlled periodic optical structures in the LC:PDMS architecture
- P6. Sylwia Karoń** Development of functional receptor layers based on DNA-directed immobilization for the SPRI immunosensing of viral infection biomarkers
- P7. Marcin Drozd** Miniaturized immunoplatforms supporting the diagnosis of lung cancer biomarkers and immunotherapies

Poster session (Mon, 18:00-20:00)

- P8. **Polina Ivanova** Nanozyme-based electrochemical immunodetection of genetic biomarkers of SARS CoV-2
- P9. **Katarzyna Tokarska** A fully integrated microfluidic-based POC device for COVID-19 testing
- P10. **Ewa Kobylska** Studies on recombinant insulin analogs interactions with partner cell membrane receptors using the SPR technique
- P11. **Michał Dudek** Evaluation of thermo-optical properties of selected liquids by photonic crystal fiber based sensor
- P12. **Anna Kurzych** Development of 3-Axis Fibre-Optic Seismograph for direct and autonomous monitoring of rotational events
- P13. **Chun-Chi Chen** CMOS Delay-Line-Based Smart Temperature Sensor
- P14. **David Valiente** Time degradation analysis of organic solar cells based on ITO / PEDOT:PSS / P3HT:PCBM / Al structure
- P15. **Krzysztof Herman** Sensor actuator network for in situ studies of antarctic plants physiology
- P16. **Tetiana Manyk** Theoretical study of the effect of stresses on the effective masses in the InAs/InAsSb type-II superlattice
- P17. **Anna Kiczor** Comparison of the properties of PMMA layers containing an organic dye and CdSe quantum dots for sensor applications.
- P18. **Magdalena Flont** A Body-on-a-chip microfluidic system for the analysis of inflammatory processes in the cancer microenvironment.
- P19. **Anna Szymczyk** Electrochemical detection of SARS-CoV-2 genetic markers using DNA biosensor based on stem-loop probe
- P20. **Jacek Majcher** Point measurements of soil moisture using TDR technique - comparison of probes
- P21. **Milija Sarajlic** Humidity and CO₂ sensing by graphene film based sensor obtained by liquid phase exfoliation

Poster session (Mon, 18:00-20:00)

- P22. Patrycja Sokołowska** 5-hexadecanoyloxyoctadecanoic acid (5-PAHSA) as a potential therapeutic agent in diabetes? - preliminary studies using the newly developed, fully functional Islet-on-chip model
- P23. Katarzyna Kurzątkowska-Adaszyńska** Electrochemical aptasensors as an ultra-sensitive tool for the detection of antibiotics after cattle antibiotic therapy
- P24. Bartosz Sakowicz** Towards to automatic correction of unwanted artifacts observed in digital data continuously recorded by a rotational seismograph
- P25. Iason-Ioannis Panagos** Tracking Multiple Instances of Retail Consumers from RGB and Thermal Images
- P26. Joanna Korec** SPR sensor based on tapered optical fiber with a low refractive index liquid crystal cladding
- P27. Monika Żuchowska** Threshold volatile organic compounds sensor based on polymer microtip
- P28. Karol Stasiewicz** Research on optical properties in a tapered optical fiber with higher alkanes cladding doped with Fe₃O₄ nanoparticles
- P29. Deuk Ju Lee** Compact Camera Fluorescence Detector for Real-Time PCR Devices Using a Parallel Light Lens
- P30. Tomasz Grzywacz** Gas chambers shape design for electronic nose
- P31. Angelos Stamou** Implementation of a smart lifejacket for assisting the evacuation process on large passengers ships
- P32. Ji-Soo Hwang** An impedance-based label-free polymerase chain reaction chip and detection system
- P33. Spela Trafela** Portable, highly sensitive and selective electrochemical biosensors for SARS-CoV-2 detection
- P34. Rafał Tarakowski** Electronic nose designs for Dendrolimus pini odour detection

Poster session (Mon, 18:00-20:00)

- P35. **Katarzyna Tokarska** A fully integrated microfluidic-based POC device for COVID-19 testing
- P36. **Kristina Zagar Soderznik** Indirect detection of acrylamide using novel biosensor element
- P37. **Arjan Lock** FBG-based sensing of the back during gait cycle
- P38. **Piotr Garbat** Application of polarization sensing for detection in scattering media
- P39. **Andrzej Olszewski** Well-secured tests of innovative hydrostatic levelling system
- P40. **Jelena Stevanovic** Humidity and CO₂ sensing by graphene film based sensor obtained by liquid phase exfoliation
- P41. **Trang Anh Nguyen** Cell counting in silicon nanosensor for CAR T-cell therapy monitoring
- P42. **Ángel Solé Morillo** PPG EduKit: An Adjustable Photoplethysmography Evaluation System for Educational Activities
- P43. **Filip Łabaj** Design and development of a miniature mid-IR spectrometer for environmental sensing and food safety applications
- P44. **Diogo Gará Caetano** Public Lighting Recognition System based on Colored Reflection Index and Computational Machine Learning
- P45. **Ester Catalano** Distributed liquid level sensor based on Brillouin sensing and active thermometry
- P46. **Wojciech Żołnowski** Multispectral portable optical fiber reflectometer

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- Manuscripts regarding research proposals and research ideas are particularly welcome.
- Electronic files and software providing full details of calculation and experimental procedures can be deposited as supplementary material.
- We also accept manuscripts regarding research projects financed with public funds in order that reach a broader audience.

Among other databases, Sensors is indexed by the Science Citation Index Expanded (Web of Science), MEDLINE (PubMed), and Scopus.

Journal Webpage: <https://www.mdpi.com/journal/sensors>

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I3S 2022 9th International Symposium on Sensor Science

This conference seeks to bring together scientists from different areas to discuss important recent developments in sensor technology. It will represent a great opportunity for an in-person meeting of an interdisciplinary community aiming to discuss important breakthroughs in sensor technology and its related fields.

Conference Venue

The Centre for Advanced Materials and Technologies (CEZAMAT) at the Warsaw University of Technology is located in Warsaw's Ursynów district. It is located 5–6 minutes away by car from the airport and has good public transport accessibility. The site also includes a covered parking lot for 180 cars and is accessible for people with disabilities. For further information please visit cezamat.eu.

Address: Polezki 19, 02-822 Warsaw, Poland



Registration Desk

The desk for registration, information and distribution of documents will be open from 16:00h on 19 June and from 7:30 on 20 June.

Certificate of Participation

The participants of the event will receive an electronic Certificate of Participation. The certificates will be available upon request to i3s2022@mdpi.com after the event has ended.

Disclaimer

Delegates will receive a name-badge at the Information Desk, upon registration. The badge must be worn prominently in order to gain access to the congress area during all scientific and social events. Admission will be refused to anyone not in possession of an appropriate badge.

Insurance

The organizers do not accept liability for personal accident, loss, or damage to private property incurred as a result of participation in I3S2022. Delegates are advised to arrange appropriate insurance to cover travel, cancellation costs, medical, and theft or damage of belongings.

Photographs and/or video will be taken during the conference

By taking part in this event you grant the event organisers full rights to use the images resulting from the photography/video filming, and any reproductions or adaptations of the images for fundraising, publicity or other purposes to help achieve the conference's aims. This might include (but is not limited to), the right to use them in their printed and online publicity, social media, press releases and funding applications.



Gala Dinner

Tuesday 21 June 2022 at 19h

Building of Physics, Warsaw University of Technology

The Gala Dinner will take place in the Building of Physics of the Warsaw University of Technology. The Building of Physics is, next to the Main Building, one of the oldest buildings of the Warsaw University of Technology. Both buildings have a common architectural concept (designed by Stefan Szyller). The building was shaped around a courtyard (Aula) covered with a colourful glass roof. The courtyard is surrounded by arcaded cloisters. Additional tickets for the accompanying persons for Gala Dinner and Welcome Reception only is 95 EUR



