

The 28th International Conference
on
Semiconductor Photocatalysis and Solar Energy Conversion
(SPASEC-28)

The 29th International Conference
on
**Advanced Oxidation Technologies for Treatment of Water,
Air and Soil**
(AOTs-29)

FINAL PROGRAM

Sponsor



Prepared By:
Professor Petr Dzik, Brno University of Technology



Brno University of Technology, Czech Republic
May 12 – 15, 2025

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Professor Christian Schoneich, University of Kansas, USA

Professor Chiaki Terashima, Tokyo University of Science, Japan

Professor Sammy Verbruggen, Antwerp University, Belgium

Professor Michal Vesely, Brno University of Technology, Czech Republic

Professor Michael Wark, University Oldenburg, Germany

Professor Shujuan Zhang, Nanjing University, China

Important Notes:

- **PL Stands for Plenary Lecture (Total 40 min)**
- **IL Stands for Invited Lecture (Total 30 min)**
- **ST Stands for Short Talk (Total 20 min)**

Monday, May 12, 2025

- 9:00 – 10:15 **On -Site Registration**
- 10:15 – 10:30 **Opening Remarks by the Conference Organizer: Dr. Hussain Al-Ekabi**

SESSION I

- 10:30 – 11:10
PL **Photoelectrochemical and Photoelectrosynthetic Reactions on n-type Semiconductor Photoelectrodes**
T. Imrich, M. Neumann-Spallart, J. Krýsa
University of Chemistry and Technology, Prague, Czech Republic
- 11:10 – 11:40
IL **Photocatalytic Air Treatment: Potentials and Limitations**
Detlef Bahnemann
Saint-Petersburg State University, Saint-Petersburg, Russia
- 11:40 – 12:10
IL **Solar Light Activated Persulfate Oxidation for the Removal of Endocrine Disruptors from Water**
Sylvia Kpange, Saltuk Pirgahoglu, Sifa Doğan.
Cyprus International University, Nicosia, North Cyprus
- 12:10 – 13:00 **LUNCH**

SESSION II

- 13:00 – 13:40
PL **Redox Mediators for Dye-Sensitized Solar Cells**
Ladislav Kavan
J. Heyrovsky Institute of Physical Chemistry of the Czech Academy of Sciences, Prague, Czech Republic
- 13:40 – 14:10
IL **Indirect Techniques of EPR Spectroscopy in Heterogeneous (Photo)Catalysis**

D. Dvoranová*, Z. Dyrčíková, M. Malček Šimunková, K. Lušpai
Slovak University of Technology, Bratislava, Slovak Republic

14:10 – 14:40
IL

Innovative Supported Photocatalysts for Solar-driven Environmental Remediation: From Lab Innovations to Real-world Applications

B. Trindade Barrocas^{1,*}, A.C. Marques¹, M. Conceição Oliveira²

¹CERENA, Department of Chemical Engineering (DEQ), Instituto Superior Técnico, Universidade de Lisboa, Portugal

²CQE, Department of Chemical Engineering (DEQ), Instituto Superior Técnico, Universidade de Lisboa, Portugal

14:40 – 15:10 COFFEE BREAK

SESSION III

15:10 – 15:30
ST

Green Sol-gel Synthesis of TiO₂, SiO₂, and ZnO Based Photocatalytic Coatings for Environmental Cleanup

M. Ayyaz, B. Aksu, M.P. Pedferri, M.V. Diamanti
Politecnico di Milano, Milan, Italy.

15:30 – 15:50
ST

TiO₂ Thin Films for Photo-, Electro- and Photoelectroactivity Degradation of Tetracycline

Lara Einfalt^{1,2,*}, Barbara Ljubec Božiček^{1,2}, Belisa Alcantara Marinho¹, Miran Čeh¹

¹Department for Nanostructured Materials, Jožef Stefan Institute, Ljubljana, Slovenia.

²Jožef Stefan International Postgraduate School, Ljubljana, Slovenia.

15:50 – 16:10
ST

Plasma Modification of Bio-Inspired Nanofibers for Removal of Micropollutants from Wastewater

**A. Fatima^{2,*}, A.P. Drdanová¹, F. Zažímal¹, J. Ryba², T. Mackuľak²,
A. V. Staňová^{3,4}, T. Homola^{1,2}**

¹Masaryk University Brno, Czech Republic

²Slovak University of Technology, Bratislava, Slovakia

³University of South Bohemia, České Budejovice, Czech Republic

⁴Comenius University, Bratislava, Slovakia

16:10 -16:30
ST

Photocatalytically Active Bio-Inspired Fabrics for the Removal of Pharmaceutical Micropollutants in Wastewater

**A.P. Drdanová¹, A. Fatima², F. Zažímal¹, J. Ryba², T. Mackuľak²,
A. V. Staňová^{3,4}, T. Homola^{1,2}**

¹Masaryk University, Brno, Czech Republic

²Slovak University of Technology, Bratislava, Slovakia

³University of South Bohemia, České Budejovice, Czech Republic

⁴Comenius University, Bratislava, Slovakia

16:30 – 17:00
IL **Innovative Visible-Light-Responsive N-TiO₂ Photocatalyst/Fishery Waste Derived-Chitosan Composite with 3D Cartographic Insights into Microbial Cells Disinfection Mechanism**

Ying-Chen Chen¹, Chih-Huang Weng², Shang-Ming Huang³, Girma Sisay Wolde¹, Jing-Hua Tzeng^{1,4}, Jenn-Wen Huang¹, Chanat Chokejaroenrat⁵, Yao-Tung Lin^{1 *}

¹ National Chung Hsing University, Taichung, Taiwan.

² I-Shou University, Kaohsiung, Taiwan.

³ China Medical University, Taichung, Taiwan.

⁴ University of Delaware, Newark, USA.

⁵ Kasetsart University, Bangkok, Thailand

17:00 – 17:20
ST **Testing the Antimicrobial Activity of Photocatalytic Surfaces via the Resazurin Assay**

M. Kralova *, M. Veselá, M. Veselý, P. Dzik

Brno University of Technology, Brno, Czech Republic

17:20 – 20:00 **WELCOME COCKTAIL**

Tuesday, May 13, 2025

SESSION IV

9:00 – 9:40
PL **Nanoarchitecture design of photocatalysts: Enhancement of photocatalytic performance and mechanism clarification**
Ewa Kowalska
Jagiellonian University, Krakow, Poland

9:40 – 10:10
IL **Hydrodynamic Cavitation as a Novel Approach for Water and Wastewater Treatment**
Parag R. Gogate
Chemical Engineering Department,
Institute of Chemical Technology, Mumbai, India

10:10 – 10:40 **COFFEE BREAK**

10:40 – 11:10 **Computational and Simulation Tools as Design Aids for Combined Air Purification Technologies**
IL

S. Denys, D. Baetens, K. Schoofs, M. Demuynck, A. Alvarado and M. Ramteke
Antwerp engineering, photoelectrochemistry and sensing (A-PECS), University of Antwerp, Belgium

SESSION V

11:10 – 11:50 **Photocatalysis Between Light and Shadow: How Misinterpretation of Data Hinders Progress**
PL

C. Guillard

University Lyon, University Claude Bernard, CNRS, IRCELYON, UMR5256, France.

11:50 – 13:00 **LUNCH**

13:00 – 13:30 **The impact of shell thickness in Au@TiO₂ core-shell nanoparticles on balancing stability and plasmonic field enhancement**
IL

Rajeshreddy Ninakanti^{1,2,3} & Sammy W. Verbruggen^{1,2*}

¹Antwerp engineering, photoelectrochemistry and sensing (A-PECS), University of Antwerp, Antwerp, Belgium

²NANOlight Center of Excellence, University of Antwerp, Antwerp, Belgium

³EMAT, University of Antwerp, Antwerp, Belgium

13:30 – 14:00 **Progress of Perovskite Solar Cells on Multiporous-Layered Electrode for Cost-Effective Hydrogen Energy Source**
IL

Seigo Ito

University of Hyogo, Hyogo, Japan

14:00 – 14:30 **Surface Nano-Engineering Towards Enhanced Photocatalytic Processes**
IL

Stěpán Kment^{1,2}

¹Regional Centre of Advanced Technologies and Materials, Czech Advanced Technology and Research Institute, Palacký University, Olomouc, Czech Republic

²Nanotechnology Centre, CEET, VSB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic

14:30 – 15:00 **Advanced Oxidation Processes for the Degradation and Detoxification of Cyanotoxins**
IL

Zeynep Eren

Ataturk University, Erzurum, Türkiye

15:00 – 15:30 **COFFEE BREAK**

SESSION VI

15:30 – 16:00 **UV-C/H₂O₂ for Removal of Organic Pollutants – from Laboratory to Practice**

IL

Pavel Krystyník

Jan Evangelista Purkyně University, Ustí nad Labem, Czech Republic

16:00 – 16:30 **Application of High Entropy Alloys in (Photo)(Electro)Catalytic Degradation of Antibiotics**

IL

Lara Einfalt^{1,2}, Barbara Ljubec Božiček^{1,2}, Belisa Alcantara Marinho¹, Miran Čeh^{1,*}

¹Department for Nanostructured Materials, Jožef Stefan Institute, Ljubljana, Slovenia.

²Jožef Stefan International Postgraduate School, Ljubljana, Slovenia.

16:30 – 16:50 **Full Scale Project with a Combined In Situ Surfactant Enhanced Flushing and Chemical Oxidation Technology for the Remediation of Organic Compounds**

ST

Guido Piepoli

A.S.T.C. Remediation srl, Milano, Italy

16:50 – 17:10 **Visible light photo-degradation of antibiotics with graphitic carbon nitride thin films: Pathways and toxicity of byproducts**

ST

D. Schimon^{1,4*}, P. Klusůň¹, P. Dzik², T. Homola³, P. Stavárek¹

¹ Institute of Chemical Process Fundamentals v.v.i., Czech Academy of Sciences, Rozvojová, Prague, Czech Republic

² Institute of Physical and Applied Chemistry, Faculty of Chemistry, Brno University of Technology, Brno, Czech Republic

³ R&D Centre for Plasma and Nanotechnology Surface Modifications, Faculty of Science, Masaryk University, Brno, Czech Republic

⁴ Faculty of Chemical Engineering, University of Chemistry and Technology Prague, Prague, Czech Republic

17:10 – 17:30 **Preparation and Characterization of WO₃ Layers Fabricated by the Brick-and-Mortar Method**

ST

T. Blecha, M. Králová, P. Dzik, M. Veselý

Brno University of Technology, Czech Republic

17:30 – 17:50 **Coprecipitation-Hydrothermal Synthesis of Conductive Sb-doped SnO₂ for Carbon-free Catalyst Support of PEMFC**

ST

T. Fukuda, Y. Yoshiyama, N. Fukumuro, S. Ito

University of Hyogo, Hyogo, Japan

17:50 – 18:10
ST

Photocatalytic Efficiency of Thermally Treated Muscovites

Patrik Kopčan^{1,2*}, Miroslava Filip Edelmannová¹, Marta Valášková¹, Bartosz Romuald Zawadzki¹, Kamila Kočí^{1,3}

¹ Institute of Environmental Technology, CEET, VŠB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic

² Faculty of Materials Science and Technology, VŠB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic

³ Department of Physics and Materials Engineering, Faculty of Technology, Tomas Bata University, Zlín, Czech Republic

18:10 – 18:30
ST

Multifunctional Bi_xO_yI_z: Integrating Photocatalysis and Cooling for Eco-friendly Building Solutions

Andrea Martínez-Topete^{1,2}, Eva Jimenez-Relinque¹, Frederic Dappozze³, Christophe Gilbert⁴, Chantal Guillard³, Andrea Folli⁵, Marta Castellote¹

¹ Institute of Construction Science Eduardo Torroja, IETcc-CSIC, Madrid, Spain

² Escuela Técnica Superior de Ingenieros Industriales, Universidad Politécnica de Madrid (UPM), Madrid, Spain

³ Université Claude Bernard Lyon 1, CNRS, Institut de Recherches sur la Catalyse et l'Environnement de Lyon (IRCELYON), UMR5256, France

⁴ Centre International de Recherche en Infectiologie (CIRI), INSERM U1111, ENS Lyon, CNRS UMR5308, Université de Lyon, Lyon, France

⁵ Net Zero Innovation Institute, Cardiff Catalysis Institute, School of Chemistry, Cardiff University, Translational Research Hub, Cardiff, UK

18:30 – 20:00

OPTIONAL: BRNO CITY WALK

Wednesday, May 14, 2025

SESSION VII

9:00 – 9:40
PL

A Review of Kinetic Models in Photocatalysis, Their Evaluation, Applicability and Inherent Limitations.

Claudio Minero, Fabrizio Sordello

University of Turin – Italy – Dept. of Chemistry, Torino, Italy

9:40 – 10:10
IL

Dissolution and photocorrosion protection of WO₃ electrodes by ALD coverage with TiO₂

Hana Krýsová^{1*}, Tomáš Imrich^{1,2}, Martin Brada², Hana Tarábková¹, Michael Neumann-Spallart², Josef Krýsa²

¹ J. Heyrovsky Institute of Physical Chemistry of the Czech Academy of Sciences,

Prague, Czech Republic

² Department of Inorganic Technology, University of Chemistry and Technology Prague, Prague, Czech Republic

10:10 – 10:40 **COFFEE BREAK**

10:40 – 11:10
IL **SrTiO₃: Fundamentals and Photocatalytic Applications**
Guido Mul, Nathalia Costa, Tursun Abudukade, Igor Siretanu, Frieder Mugele, Marco Altomare, Bastian Mei
University of Twente, Faculty of Science and Technology, Chemical Engineering Department, MESA+ Institute for Nanotechnology, PO Box 217, 7500 AE, Enschede, The Netherlands

11:10 – 11:40
IL **Transient IR measurements as a tool for understanding photoactive materials: what have we learned from studying the photocatalytic Metal Organic Framework (MOF) MIP177?**
Yaron Paz
Department of Chemical Engineering, Technion- Israel Institute of Technology, Haifa, Israel

11:40 – 13:00 **LUNCH**

SESSION VIII

13:00 – 13:40
PL **Synergistic Catalyst Design and Mechanistic Insights for Enhanced Photocatalytic Urea Synthesis from CO₂ and N₂**
Irfan Ahmad, Xie Quan
Dalian University of Technology, Dalian, China

13:40 – 14:10
IL **Enhancing the number of active amino groups in polymeric carbon nitride photocatalysts**
Michael Wark, Marco Weers, Thanh Thao Nguyen thi
Institute of Chemistry, Chemical Technology 1, Carl-von-Ossietzky Universität Oldenburg, Oldenburg, Germany

SESSION IX: PFAS Oxidative Treatment

14:10 – 14:40
IL **Ultrasound Induced Mineralization of Per- and Polyfluoroalkyl Substances (PFAS)**

Xuexiang He, Kevin E O'Shea

Department of Chemistry and Biochemistry, Florida International University,
Miami, United States

14:40 – 15:00
ST **What is the Environmental Risk of PFAS? How Can They Be Treated?**

Zeynep Eren

Ataturk University, Engineering Faculty, Environmental Engineering Department, Erzurum,
TÜRKİYE

15:00 – 15:20
ST **Efficiency and mechanism of UV-based intermittent reductive/oxidative
defluorination of PFOA&PFOS**

S. Liu¹, H.H.M. Rijnaarts¹, R.C. Hofman-Caris^{1,2}, H. Bruning^{1,*}

¹Environmental Technology, Wageningen University and Research, Wageningen, the Netherlands

²KWR Water Research Institute, Nieuwegein, the Netherlands

15:20 – 19:10
**TRIP TO BASILICA PILGRIMAGE KŘTINY AND VÝPUSTEK
CAVE**

19:10 – 20:40
DINNER

Thursday, May 15, 2025

SESSION X

9:00 – 9:40
PL **Nanoshaped plasmonic solids for heterogeneous photocatalytic
applications**

Albin Pintar

Department of Inorganic Chemistry and Technology, National Institute of Chemistry,
Ljubljana, Slovenia

9:40 – 10:10
IL **The Czech Society for Applied Photocatalysis: Activities and
Opportunities**

Jan Procházka

The Czech Society for Applied Photocatalysis, Prague, Czech Republic

10:10 – 10:40
COFFEE BREAK

10:40 – 11:10
IL **Photocatalytic Titanium Dioxide in the Environmental Purification**
Chiaki Terashima^{1,2,3}, Hiroshi Uetsuka^{2,4}, and Katsuya Teshima^{2,3}

¹ Department of Pure and Applied Chemistry, Faculty of Science and Technology, Tokyo University of Science, Chiba, Japan

² Research Center for Space System Innovation, Tokyo University of Science, Chiba, Japan

³ Institute for Aqua Regeneration, Shinshu University, Nagano, Japan

⁴ Asahi Diamond Industrial Co., Ltd., Kanagawa, Japan

11:10 – 11:40
IL **Unusual Radical Transformation Reactions as a Result of Light-Induced Ligand-to-Metal Charge Transfer of Iron Complexes**

Christian Schöneich

Department of Pharmaceutical Chemistry, University of Kansas, Kansas, USA

11:40 – 12:10
IL **Thermo-photocatalytic removal of VOCs via TiO₂ supported on the nickel foam under UV-LED irradiation**

Beata Tryba, Maciej Trzeciak, Piotr Miądlicki

West Pomeranian University of Technology, Szczecin, Poland

12:10 – 13:00 **LUNCH**

SESSION XI

13:00 – 13:20
ST **Photocatalytic Porous Coatings of Graphitic Carbon Nitride with Improved Adhesion Through Surface Preparation**

S. Patakyová, P. Dzik

Brno University of Technology, Czech Republic

13:20 – 13:40
ST **Influence of Surface Charge and Functional Groups of Malachite Green and Methyl Red on Adsorption and Photocatalytic Degradation by Oxygen Vacancy-Enriched ZnO**

Alireza Ranjbari^{1,2}, Philippe M. Heynderickx^{1,2,*}

¹ Center for Green Chemistry and Environmental Biotechnology, Ghent University Global Campus, South Korea;

² Department of Green Chemistry and Technology, Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium

13:40 – 14:00
ST **TiO₂-EPS photocatalytic bed for acetaldehyde removal in the gas phase fluidized bed photoreactor**

P. Rychtowski, B. Prowans, P. Miądlicki, M. Trzeciak, B. Tryba

¹Department of Catalytic and Sorbent Materials Engineering, West Pomeranian University of Technology, Szczecin, Poland

14:00 – 14:20 ST	<p>Preparation and characterization of TiO₂ nanorods@Ni-foam with in situ FTIR surface analyses during photocatalytic decomposition of acetaldehyde</p> <p><u>P. Rychtowski</u>, B. Prowans, P. Miądlicki, M. Trzeciak, B. Tryba West Pomeranian University of Technology, Szczecin, Poland</p>
14:20 – 14:40 ST	<p>Optimized Crystallization of FA-Based Perovskite Light Absorber in Multiporous Layered Electrode Perovskite Solar Cells</p> <p><u>T. Shioki</u>, S. Oshita, N. Izumoto, S. Ito* University of Hyogo, Hyogo, JAPAN</p>
14:40 – 15:00 ST	<p>The Urbach energy as an important parameter in material optimization</p> <p><u>L. Svoboda</u>¹, Z. Vilamová¹, P. Praus^{2,3}, J. Bednář¹, Z. Šimonová⁴, R. Dvorský⁴</p> <p>¹Nanotechnology Centre, Centre for Energy and Environmental Technologies, VSB – Technical University of Ostrava, Ostrava, Czech Republic ²Department of Chemistry and Physico-Chemical Processes, VSB – Technical University of Ostrava, Ostrava, Czech Republic ³Institute of Environmental Technology, Centre for Energy and Environmental Technologies, VSB – Technical University of Ostrava, Ostrava, Czech Republic ⁴Centre for Advanced Innovation Technologies, Faculty of Materials Science and Technology, VSB – Technical University of Ostrava, Ostrava, Czech Republic</p>
15:00 – 15:20 ST	<p>Application of Metallic Foams and Titanium Dioxide Composites for Photocatalytic Removal of Volatile Organic Compounds</p> <p><u>Maciej Trzeciak</u>, Bartłomiej Prowans, Beata Tryba Faculty of Chemical Technology and Engineering, West Pomeranian University of Technology, Szczecin, Poland</p>
15:20 – 15:50	COFFEE BREAK
15:50 – 16:20 IL	<p>Material Printing of Indicators Based on Photochemical and Photocatalytic Principle</p> <p><u>M. Veselý</u>, V. Dobiáš, D. Filipi, P. Dzik Brno University of Technology, Faculty of Chemistry, Brno, Czech Republic</p>
16:20 – 16:50 IL	<p>Printed Photoelectrochemical Cells for Sensing, Remediation and Energy Harvesting</p> <p><u>P. Dzik</u>, M. Veselý Brno University of Technology, Faculty of Chemistry, Brno, Czech Republic</p>
16:50 – 17:00	CLOSING REMARKS

