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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Dr. Jan Prochazka, President, Czech Society for Applied Photocatalysis (CSAP), Czech Republic

Dr. Martina Repkova, Brno University of Technology, Czech Republic

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 **Ultraviolet Ultrasound and Solar Light Activated Persulfate Oxidation for the Removal of Endocrine Disruptors from Water**
Slyvia Kpange, Olanireti Oni, Şifa Doğan, Saltuk Pirgalıoğlu
Cyprus International University, Nicosia, North Cyprus

12:10 – 13:00 **LUNCH**

SESSION II

13:00 – 13:40 PL **Redox Mediators for Dye-Senstized 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. Marques[1], M. Conceição Oliveira[2]

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

[2]CQE, 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 TiO_2, SiO_2, and ZnO Based Photocatalytic Coatings for Environmental Cleanup

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

15:30 – 15:50 ST

TiO_2 Thin Films for Photo-, Electro- and Photoelectroactivity Degradation of Tetracycline

Lara Einfalt[1,2,*], Barbara Ljubec Božiček[1,2], Belisa Alcantara Marinho[1], Miran Čeh[1]
[1]Department for Nanostructured Materials, Jožef Stefan Institute, Ljubljana, Slovenia.
[2]Jožef 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. Drdanová[1], F. Zažímal[1], J. Ryba[2], T. Mackuľak[2], A. V. Staňová [3,4], T. Homola[1,2]
[1]Masaryk University Brno, Czech Republic
[2]Slovak University of Technology, Bratislava, Slovakia
[3]University of South Bohemia, České Budejovice, Czech Republic
[4]Comenius University, Bratislava, Slovakia

16:10 -16:30 ST

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

A.P. Drdanová[1], A. Fatima[2], F. Zažímal[1], J. Ryba[2], T. Mackuľak[2], A. V. Staňová [3,4], T. Homola[1,2]
[1]Masaryk University, Brno, Czech Republic
[2]Slovak University of Technology, Bratislava, Slovakia

[3]University of South Bohemia, České Budejovice, Czech Republic
[4]Comenius University, Bratislava, Slovakia

16:30 – 17:00 IL

Innovative Visible-Light-Responsive N-TiO_2 Photocatalyst/Fishery Waste Derived-Chitosan Composite with 3D Cartographic Insights into Microbial Cells Disinfection Mechanism

Ying-Chen Chen[1], Chih-Huang Weng[2], Shang-Ming Huang[3], Girma Sisay Wolde[1], Jing-Hua Tzeng[1,4], Jenn-Wen Huang[1], Chanat Chokejaroenrat[5], 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 IL **Computational and Simulation Tools as Design Aids for Combined Air Purification Technologies**

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 PL **Photocatalysis Between Light and Shadow: How Misinterpretation of Data Hinders Progress**

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

11:50 – 13:00 **LUNCH**

13:00 – 13:30 IL **The impact of shell thickness in Au@TiO_2 core-shell nanoparticles on balancing stability and plasmonic field enhancement**

Rajeshreddy Ninakanti[1,2,3] & Sammy W. Verbruggen[1,2*]
[1]Antwerp engineering, photoelectrochemistry and sensing (A-PECS), University of Antwerp, Antwerp, Belgium
[2] NANOlight Center of Excellence, University of Antwerp, Antwerp, Belgium
[3] EMAT, University of Antwerp, Antwerp, Belgium

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

Seigo Ito
University of Hyogo, Hyogo, Japan

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

Stěpán Kment[1,2]
[1]Regional Centre of Advanced Technologies and Materials, Czech Advanced Technology and Research Institute, Palacký University, Olomouc, Czech Republic
[2]Nanotechnology Centre, CEET, VSB-Technical University of Ostrava, Ostrava-Poruba, Czech Republic

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

Zeynep Eren

Ataturk University, Erzurum, Türkiye

15:00 – 15:30 **COFFEE BREAK**

SESSION VI

15:30 – 16:00
IL

UV-C/H2O2 for Removal of Organic Pollutants – from Laboratory to Practice

Pavel Krystyník
Jan Evangelista Purkyně University, Ustí nad Labem, Czech Republic

16:00 – 16:30
IL

Application of High Entropy Alloys in (Photo)(Electro)Catalytic Degradation of Antibiotics

Lara Einfalt[1,2], Barbara Ljubec Božiček[1,2], Belisa Alcantara Marinho[1], Miran Čeh[1,*]

[1]Department for Nanostructured Materials, Jožef Stefan Institute, Ljubljana, Slovenia.
[2]Jožef Stefan International Postgraduate School, Ljubljana, Slovenia.

16:30 – 16:50
ST

Full Scale Project with a Combined In Situ Surfactant Enhanced Flushing and Chemical Oxidation Technology for the Remediation of Organic Compounds

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

16:50 – 17:10
ST

Visible light photo-degradation of antibiotics with graphitic carbon nitride thin films: Pathways and toxicity of byproducts

D. Schimon[1,4*], P. Klusoň[1], P. Dzik[2], T. Homola[3], P. Stavárek[1]
[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
ST

Preparation and Characterization of WO_3 Layers Fabricated by the Brick-and-Mortar Method

T. Blecha, M. Králová, P. Dzik, M. Veselý
Brno University of Technology, Czech Republic

17:30 – 17:50
ST

Coprecipitation-Hydrothermal Synthesis of Conductive Sb-doped SnO_2 for Carbon-free Catalyst Support of PEMFC

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 Edelmannová [1], Marta Valášková [1], Bartosz Romuald Zawadzki [1], 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-Relinque[1], Frederic Dappozze[3], Christophe Gilbert[4], Chantal Guillard[3], Andrea Folli[5], Marta Castellote[1]

[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 WO_3 electrodes by ALD coverage with TiO_2

Hana Krýsová[1]*, Tomáš Imrich[1,2], Martin Brada[2], Hana Tarábková[1], Michael Neumann-Spallart[2], Josef Krýsa[2]

[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 **$SrTiO_3$: 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 CO_2 and N_2**
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. Liu[1], H.H.M. Rijnaarts[1], R.C. Hofman-Caris[1,2], H. Bruning[1,*]
[1]Environmental Technology, Wageningen University and Research, Wageningen, the Netherlands
[2]KWR 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 TiO_2 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 **TiO_2-EPS photocatalytic bed for acetaldehyde removal in the gas phase fluidized bed photoreactor**
P. Rychtowski, B. Prowans, P. Miądlicki, M. Trzeciak, B. Tryba
[1]Department of Catalytic and Sorbent Materials Engineering, West Pomeranian University of Technology, Szczecin, Poland

14:00 – 14:20 ST

Preparation and characterization of TiO_2 nanorods@Ni-foam with in situ FTIR surface analyses during photocatalytic decomposition of acetaldehyde

P. Rychtowski, B. Prowans, P. Miądlicki, M. Trzeciak, B. Tryba
West Pomeranian University of Technology, Szczecin, Poland

14:20 – 14:40 ST

Optimized Crystallization of FA-Based Perovskite Light Absorber in Multiporous Layered Electrode Perovskite Solar Cells

T. Shioki, S. Oshita, N. Izumoto, S. Ito*
University of Hyogo, Hyogo, JAPAN

14:40 – 15:00 ST

The Urbach energy as an important parameter in material optimization

L. Svoboda[1], Z. Vilamová[1], P. Praus[2,3], J. Bednář[1], Z. Šimonová[4], R. Dvorský[4]
[1]Nanotechnology Centre, Centre for Energy and Environmental Technologies, VSB – Technical University of Ostrava, Ostrava, Czech Republic
[2]Department of Chemistry and Physico-Chemical Processes, VSB – Technical University of Ostrava, Ostrava, Czech Republic
[3]Institute of Environmental Technology, Centre for Energy and Environmental Technologies, VSB – Technical University of Ostrava, Ostrava, Czech Republic
[4]Centre for Advanced Innovation Technologies, Faculty of Materials Science and Technology, VSB – Technical University of Ostrava, Ostrava, Czech Republic

15:00 – 15:20 ST

Application of Metallic Foams and Titanium Dioxide Composites for Photocatalytic Removal of Volatile Organic Compounds

Maciej Trzeciak, Bartłomiej Prowans, Beata Tryba
Faculty of Chemical Technology and Engineering, West Pomeranian University of Technology, Szczecin, Poland

15:20 – 15:50 **COFFEE BREAK**

15:50 – 16:20 IL

Material Printing of Indicators Based on Photochemical and Photocatalytic Principle

M. Veselý, V. Dobiáš, D. Filipi, P. Dzik
Brno University of Technology, Faculty of Chemistry, Brno, Czech Republic

16:20 – 16:50 IL

Printed Photoelectrochemical Cells for Sensing, Remediation and Energy Harvesting

P. Dzik, M. Veselý
Brno University of Technology, Faculty of Chemistry, Brno, Czech Republic

16:50 – 17:00 **CLOSING REMARKS**