Department of Chemical Engineering, University of Patras

University of Patras

# Workshop of Graduates in Chemical Engineering

Organized by the graduate program of the Department of Chemical Engineering, University of Patras

## Program

Conference Center
University of Patras

20 – 21 March 2025

Co-funded by the European Union

Human Resources and Social Cohesion Programme

| Thursday, 20th March | |
|---|---|
| 9:30-10:00 | Welcome and Opening Remarks (Prof. A. Katsaounis, Prof. G. Kyriakou) |
| 10:00-11:00 | 1st Keynote Presentation<br>**Systems Approaches in Bioprocess Design: Towards a Sustainable Industrial Biotechnology**<br>**Prof. Constantinos Theodoropoulos (Department of Chemical Engineering, University of Manchester)** |
| 11:00-11:15 | **OPTIMAL DESIGN OF A RENEWABLE ENERGY PRODUCTION SYSTEM INCLUDING GREEN HYDROGEN PRODUCTION TO SUPPORT A PUBLIC BUILDUING**<br>A. Tsoulou, I. Kookos |
| 11:15-11:30 | **HYBRID SORBENTS AND PROCESS FOR HARVESTING AND PRODUCTION OF CLEAN WATER FROM THE ATMOSPHERE**<br>K. Papadopoulos, G.E. Romanos, L. Dumee, G.N. Karanikolos |
| 11:30-12:00 | Coffee Break |
| 12:00-12:15 | **ELECTROCHEMICAL STUDY OF ELECTRIC DOUBLE LAYER CAPACITORS (EDLCS) BASED ON ACTIVATED CARBON POROUS MATERIALS DERIVED FROM REED STRAW BIOMASS**<br>C. Karampini, J. Papavasiliou |
| 12:15-12:30 | **ELECTROCHEMICAL PROMOTION OF Ru CATALYST SYPPORTED ON YSZ SOLID ELECTROLYTE DURING DRY REFORMING OF METHANE**<br>A. Lymperi, A.K. Bikogiannakis, G. Kyriakou, A. Katsaounis |
| 12:30-12:45 | **The Synergistic Interplay Between $TiO_2$ Defects and Ru Single Atoms and Nanoparticles in $CO_2$ Hydrogenation Catalysis**<br>A.K. Bikogiannakis, A. Lymperi, C. Drivas, A. Katsaounis, M.J. Taylor, G. Kyriakou |
| 12:45-13:00 | **$SO_3$ catalytic splitting for sulfur based thermochemical storage of solar thermal energy**<br>L. Kollias, T. Kentri, I. Baltanidis, S. Boghosian |
| 13:00-14:00 | Break |
| 14:00-15:00 | 2nd Keynote Presentation<br>**A Deep Learning Approach to Virtual IC Fabrication**<br>**Prof. Dong Ni (School of Micro-Nano Electronics, Zhejiang University)** |
| 15:00-15:15 | **SPATIOTEMPORALLY DISTRIBUTED PHYSICOCHEMICAL DYNAMICS: MULTISCALE SENSING, CONTROL, OPTIMIZATION & DESIGN**<br>A. Plakkat, D. Belounis, A. Armaou |
| 15:15-15:30 | **SMART ANTIMICROBIAL FORMULATIONS BASED ON COPPER-DOPED SILICA NANOPARTICLES, ESSENTIAL OILS AND SHORT KERATIN-DERIVED PEPTIDES: INSIGHTS FROM MOLECULAR MODELLING**<br>I. Papageorgiou, K.S Karadima, V.G. Mavrantzas |
| 15:30-15:45 | **Predicting and parameterizing the glass transition temperature of atmospheric organic aerosol components via molecular dynamics simulations**<br>P. Siachouli, V.G. Mavrantzas, S.N. Pandis |
| 15:45-16:00 | **Ultrafine Particles in the Atmosphere of Europe: Source Contributions and Nucleation**<br>E. Poulikidi, D. Patoulias, S.N. Pandis |
| 16:00-17:30 | Poster session |

| Friday 21st of March 2025 | |
|---|---|
| 10:00-11:00 | 3rd Keynote Presentation<br>**Examples from the Computational Microscope: On Light Harvesting and Antibiotics Translocation through Membrane Pores**<br>**Prof. Dr. Urlich** Kleinekathöfer **(School of Science, Constructor University)** |
| 11:00-11:15 | **Photosynthesis under Computational Microscope: Machine Learning And AI-based Configurational Space of Fucoxanthin and Chlorophyll-a/c Binding Proteins (FCP) In Diatoms**<br>B. Zender, V. Daskalakis |
| 11:15-11:30 | **STUDY OF THE CATALYTIC MECHANISM OF ENZYMES ACTIVE ON NATURAL AND SYNTHETIC POLYMERS VIA X-RAY CRYSTALLOGRAPHY AND MOLECULAR DYNAMICS**<br>P. Karampa, K. Makryniotis, E. Nikolaivits, E. Topakas, V. Daskalakis, M. Dimarogona |
| 11:30-11:45 | **MASS TRANSFER EFFECTS DURING BUBBLE MOBILIZATION IN YIELD STRESS FLUIDS VIA PRESSURE REDUCTION**<br>A. Kordalis, G. Esposito, P. Zakeri, Y. Dimakopoulos, J. Tsamopoulos |
| 11:45-12:00 | **BIOREMEDIATION OF ANAEROBIC DIGESTION EFFLUENT AND BIOPLASTIC PRODUCTION THROUGH MICROALGAE AND CYANOBACTERIA CULTIVATION: EVALUATING A TWO-STAGE STRATEGY FOR ENHANCED BIOPLASTIC PRODUCTION**<br>E. Sventzouri, K. Pispas, M. Kornaros |
| 12:00-12:30 | Coffee Break |
| 12:30-12:45 | **MICROFLUIDIC INVESTIGATION OF CRYSTALS' DISSOLUTION**<br>C. Michalopoulou, I. Kouliatsa, S. Loukoutou, C. Paraskeva, V. Sygouni |
| 12:45-13:00 | **PLASMA ASSISTED SOLVOLYSIS OF COMPOSITES FOR RECOVERY OF CARBON FIBERS**<br>D. Marinis, E. Farsari, E. Amanatides |
| 13:00-13:15 | **ULTRASONIC ACTIVATED NANOMEDICINES FOR TARGETED THERAPY OF PANCREATIC CANCER**<br>D. Touba, G. Pasparakis |
| 13:15-13:30 | **Development and study of food packaging composites based on PVA and cellulosic materials**<br>K. Papapetros, G. Mathioudakis, D. Vroulias, N. Koutroumanis, K.S. Andrikopoulos, G.A. Voyiatzis |
| 13:30-13:40 | Closing Remarks |

| Posters | |
|---|---|
| **Thematic Unit A: Process and Environmental Engineering** | |
| 1 | **BIODEGRADATION OF COMMERCIAL AND HIGH-PURITY BIOPLASTICS IN ANAEROBIC CONDITIONS: INFLUENCE OF PARTICLE SIZE AND FOOD WASTE CO-DIGESTION**<br>R.K. Tolis, V. Adamopoulou, M. Kornaros |
| 2 | **CO-COMPOSTING FOOD WASTE WITH BIOPLASTICS AND DIGESTATE USING A CONTINUOUS PILOT-SCALE COMPOSTER**<br>K. Klavdianou, M. Manou, A. Stylianou, V. Adamopoulou, M. Kornaros |
| 3 | **SIMULATION OF PLASMA PROCESSES: DIELECTRIC BARRIER DISCHARGE (DBD) and INDUCTIVELY COUPLED PLASMA (ICP)**<br>D. E. Belounis, A. Armaou |
| **Thematic Unit B: Applied Physical Chemistry – Chemistry and Electrochemical Reaction Engineering** | |
| 4 | **Cs GROWTH ON A MODEL Ni(111) SURFACE: INVESTIGATION OF THE GROWTH MODE AND IMPACT ON CO REACTIVITY**<br>A. K. Bikogiannakis, V. Mastakas and G. Kyriakou |
| 5 | **HETEROGENEOUS ACTIVATION OF PERSULFATE BY METAL-ORGANIC FRAMEWORK-BASED HYBRID CATALYSTS FOR THE REMOVAL OF PERSISTENT ORGANIC POLLUTANTS FROM AQUEOUS ENVIRONMENTS**<br>K. Kouvelis, D. Kyritsopoulos, G. Bambos, A. Petala, Z. Frontistis, G.N. Karanikolos |
| 6 | **GRAPHENE-BASED COMPOSITE MEMBRANES FOR HYDROGEN PERMEATION BARRIER APPLICATIONS**<br>G.P. Tsouvaltzi, C. Galiotis, R. K. A. Al-Rub, G.N. Karanikolos |
| **Thematic Unit C: Materials Science and Technology** | |
| 7 | **BIORTHOGONAL CROSSLINKING MECHANISMS FOR POLYMER NETWORK FORMATION**<br>A. Anagnostou, G. Pasparakis |
| 8 | **EFFECT OF DIFFERENT MAGNESIUM SOURCES ON STRUVITE RECOVERY**<br>C.Y. Sousa, P.D. Natsi, A. Fernandes, P.G. Koutsoukos |
| 9 | **ΜΕΛΕΤΗ ΑΣΒΕΣΤΟΠΟΙΗΣΗΣ ΠΟΛΥΜΕΡΙΚΩΝ ΥΛΙΚΩΝ ΜΕ ΑΝΤΙΜΙΚΡΟΒΙΑΚΗ ΔΡΑΣΗ**<br>Π. Μαρούλη, Π. Δ. Νάτση, Ι. Τζουμάνη, Σ. Μαρινάκης, Ε. Ντάλας, Π. Γ. Κουτσούκος |

**Organizing Committee:**

Katsaounis Alexandros (Professor, Head of the Department)
Kyriakou Georgios (Professor, Director of Post Graduate Studies)

Sypsa Maria (Technical & Laboratory Personnel)

Androulakis Silas (PhD candidate)
Bikogiannakis Alexandros Kyriakos (PhD candidate)
Karampa Panagiota (PhD candidate)
Lymperi Andriana (PhD candidate)

Co-funded by the European Union

ΕΣΠΑ 2021-2027 Βιώσιμη Ανάπτυξη για Όλους

Human Resources and Social Cohesion Programme