

Unconventional Catalysis, Reactors and Applications (UCRA4)

June 24-26 A.D 2026 Mariehamn Åland Islands, *Alandica*

Conference Program

Plenary (PL) lectures à 60 min and keynote lectures (KN) à 30 min: *Hall A*

Parallel lectures (L1-L62) à 20 min: *Hall A & Hall B (first author mentioned in the list)*

Opening and closing ceremonies: *Hall A*

Wednesday, June 24

8:00 Registration opens

8:40 Conference opening address

9:00-10:20 Parallel Lectures (L1-L8)

Hall A

9:00 L1 Weijts, Joule-heated reactor structures for the electrification of direct air capture

9:20 L2 Spyroglou, Inductively self-heating Fe(Co, Cu) catalysts for reverse water gas shift: evidence of temperature gradients at the nanoscale

9:40 L3 Besspalko, A Multifunctional CombiSonoPlasma® reactor for simultaneous treatment of oil-contaminated hypersaline produced water and hydrogen production

10:00 L4 Sedminek, Heating the Catalyst, Not the planet: Magnetic induction as a platform for electrified CO₂ and NH₃ valorisation

Hall B

9:00 L5 Batchelor, Thermo-responsive catalysts for PET glycolysis: High-throughput design towards circular recycling

9:20 L6 Lorber, No coke, no problem: theoretical perspective on how visible light prevents carbon accumulation during DRM on nickel-ceria catalysts

9:40 L7 Shahid, Ru/C catalysts on 3D-Printed α -Al₂O₃ supports for lignin reductive depolymerization

10:00 L8 Haroun, Electrification of endothermic fixed-bed catalytic reactors: multiphysics computational modeling of a Joule-heated fixed-bed reactor, experimental validation and Joule-heating design optimization

10:20-10:30 Break

10:30-11:30 Plenary lecture (PL1) Andrzej Stankiewicz (TU Delft & Politechnika Warszawska):

Unconventional, intensified reactors in space exploration

11:30-12:00 Keynote lecture (KN1) Riikka Puurunen (Aalto University): Atomic Layer Deposition (ALD) in catalysis

12:00-12:30 Keynote lecture (KN2) Soudabeh Saeid (California Institute of Technology):

Advanced catalytic and electrochemical ozonation for sustainable pharmaceuticals degradation

12:30-14:00 Lunch break

14:00-16:00 Parallel Lectures (L9-L20)

Hall A

14:00 L9 Rebrov, Engineering biochar catalysts for plastic pyrolysis via a cold plasma treatment

14:20 L10 Romanelli, EMERALD: A novel radial-current electrified reactor for the Intensification of SMR modeling and experimental validation

14:40 L11 Grilc, Process electrification by innovative electro-thermal fluidized bed reactor

15:00 L12 Sheryll Hernandez, Continuous conversion of water into hydrogen peroxide in a flexible microwave plasma reactor concept and progress
15:20 L13 Zareghorbaei, CO₂-Free hydrogen and syngas production from methane pyrolysis using electrothermal fluidized bed technology
15:40 L14 Okorn, Intensification of the low-temperature RWGS activity of copper ceria catalysts enabled by visible light

Hall B

14:00 L15 Grifasi, Low-temperature CO oxidation over MnO_x catalysts synthesized via a CO₂-assisted solvothermal route
14:20 L16 Sarkov, Structure–acidity–activity relationships in multifunctional Fe-Ni catalysts for jet-range hydrocarbon production from model compound n-hexadecane
14:40 L17 Shanshan Xu, Revealing cooperative role of non-thermal plasma and ZSM-5 supported Cu-Zn catalysts in CO₂ hydrogenation
15:00 L18 Gallego-Villada, Copper phthalocyanines as precursors for direct oxidation of methane to methanol in liquid phase
15:20 L19 Pakrieva, Laser–driven synthesis of advanced carbon–based catalysts from aerosolized organic precursors
15:40 L20 Dehua Cheng, Photothermal CO₂ hydrogenation over molybdenum oxysulfide-based heterojunctions

16:00-16:20 Coffee break

16:20-17:00 Parallel Lectures (L21-L24)

Hall A

16:20 L21 Ahmedi, Magnetically induced iron-catalyzed hydrodeoxygenation of benzylic esters and polyesters
16:40 L22 Belchen, Catalytic reverse water gas shift reaction assisted by an electric field over cerium- and zirconium-based materials

Hall B

16:20 L23 Omojola, On the induction period of propylene formation from methanol over ZSM-5 catalysts
16:40 L24 Korir, Human-in-the-loop LLM-assisted catalyst design for CO₂-to-DME Conversion: From hypothesis generation to experimental validation

17:00-22:00 Welcoming Reception and Poster Session

Thursday June 25

8:00-9:20 Parallel Lectures (L25-L32)

Hall A

8:00 L25 Gutsch, Liquid metal based bubble column reactor solving coking issues for high reaction temperatures
8:20 L26 Berretta, Enhanced methanol synthesis by sorbent circulation
8:40 L27 Russel, A computationally efficient 2d pseudo-homogeneous reactor model for evaluating operational strategies in exothermic packed-bed reactors
9:00 L28 Renda, Prototype reactors and their viability for sorption-enhanced processes: continuous sorbent flux fluidized bed reactors (CSFFBR)

Hall B

8:00 L29 Pitinová, Selective hydroformylation of styrene over rhodium supported on layered and exfoliated transition metal dichalcogenides
8:20 L30 D'Angelo, Intensification of furfural production using a catalytic HiGee reactor
8:40 L31 Orabona, Bridging homogeneous and heterogeneous catalysis: grafted ionic liquids for the selective CO₂ conversion into limonene-based cyclic carbonates
9:00 L32 Zsarda, Biomembranes for the combined separation and enzymatic treatment of microplastic samples

9:20-9:30 Break

9:30-10:30 Plenary lecture (PL2) Johannes Schenk (Montanuniversität Leoben):

Achieving CO₂-free steelmaking: pathways and challenges

10:30-11:00 Keynote lecture (KN3) Pierdomenico Biasi (Casale)

11:00-11:20 Break

11.20-13:00 Parallel Lectures (L33-L42)

Hall A

11:20 L33 Salmi, New structured catalysts for production of sugar alcohols: from experiments to modelling, from batch to continuous operation

11:40 L34 Ortega-Jáuregui, Sandwich hollow fibre module for enhanced water-gas shift performance

12:00 L35 Haroun, Experimental and CFD study of metallic foam and monolith structure as catalyst supports for the selective hydrogenation of acetylene

12:20 L36 De Vos, Direct Ink Writing (DIW) of shaped catalysts for multiscale transport optimization

12:40 L37 Tricas, Process intensification in an elastic foam-bed reactor: hydrodynamics, mass transfer and modeling

Hall B

11:20 L38 Vincenzi, Process-driven insights into LDH inhibition for next-generation enzyme-based anticancer screening

11:40 L39 Escudero-Amate, Prussian blue analogues within liposomal nanoreactors for glutathione depletion

12:00 L40 Chaudhari, Catalytic wet oxidation treatment process for reduction of COD, phenol, and cyanide in coking wastewater

12:20 L41 Keshav, Esterification of acrylic acid using a catalyst prepared from waste bone- catalyst characterization and Influence of operating parameters on yield

12:40 L42 Garbarino, Kinetic assessment of reductive depolymerization of hydrolysis lignin on a Pd catalyst

13:00-14:20 Lunch & Posters

14:20-15:20 Plenary lecture (PL3) Chris Hardacre (University of Manchester): Plasma catalysis and technology

15:20-16:00 Coffee and preparation for conference excursion

16:00 Departure for excursion to Kastelholm Castle and Bomarsund fortress

20:00-23:00 Conference reception

Friday June 26

8:00-9:20 Parallel Lectures (L43-L50)

Hall A

8:00 L43 Yevdokimova, Application of defect-engineered metal-organic frameworks for aldol condensation toward aviation fuel precursors synthesis

8:20 L44 Onoh, Electrocatalytic hydrodeoxygenation of aldehydes in Pd@CNT-stabilized pickering emulsions

8:40 L45 Korpýs, Catalytic oxidation of methane in a FeCrAlloy foam-packed fixed-bed reactor

9:00 L46 Perez-Sena, An Experimental methodology for bubble diameter estimation in a gas-inducing reactor: Application to CO₂ cycloaddition of bio-based epoxides

Hall B

8:00 L47 Hachhach, Modeling of complete recycling arabinose oxidation

8:20 L48 da Cruz, Newly designed reactor inserts for catalytic hydrodeoxygenation of biomass pyrolysis oil model compounds in a continuous slurry reactor

8:40 L49 Russo, Use of 3D-printed CSTRs in the ketalization of ethyl levulinate with glycerol

9:00 L50 Lee, Rotating packed bed with enzyme coated packing for CO₂ capture and conversion

9:20-9:30 Break

9:30-10:30 Plenary lecture (PL4) Polona Žnidarsič Plazl (University of Ljubljana):
Flowing toward sustainability: intensified biocatalytic processes in microreactors

10:30-11:00 Keynote lecture (KN4) Professor Lars-Eric Lindfors Lecture

Gregory Yablonsky (Washington University in St Louis): Chemical kinetics as a source of new concepts and applications

11:00-11:30 Break

11:30-12:00 Keynote lecture (KN5) Nataliya Shcherban (L.V. Pisarzhevskii Institute of Physical Chemistry National Academy of Sciences of Ukraine): Supported metal nanoparticles for catalytic applications

12:00-13:30 Lunch & Posters

13:30-14:00 Keynote lecture (KN6) Matias Alvear Cabezón (Johns Hopkins University):
Oxyfunctionalization of polymers: a mass transport problem

14:00-15:00 Parallel Lectures (L51-L56)

Hall A

14:00 L51 Arun, Plasma-assisted desorption in CO₂ Capture: A dual-functional material approach

14:20 L52 Alias-Lapasauskaite, Microwave-assisted dry reforming of methanol for CO₂ valorization in structured monoliths coated with LaNiO₃ nanoparticles

14:40 L53 Kieble, Tailored reactor concept for electrified induction heating: Enhancing reactor performance through heat-integration and additively manufactured metallic structures

Hall B

14:00 L54 Pervaiz, Parametric optimization and kinetic analysis of CO₂ hydrogenation in SOEC: A step further towards power to X

14:20 L55 Capasso, Modelling of carbon dioxide methanation in radial flow reactor

14:40 L56 Ferraro, Regeneration of iron-molybdate catalyst for methanol to formaldehyde reaction: molybdenum recovery and circular economy

15:00-16:00 Parallel Lectures (L57-L62)

Hall A

15:00 L57 Massaro, 3D-printed structures for photo- and electro-chemical applications

15:20 L58 Jialin Yu, Catalytic micro-monolith reactor for continuous selective oxidation of methane

15:40 L59 Wei, Inverse 3D-printing and wire reinforcement for catalytic direct Joule heating: demonstration for CO₂ utilization via reverse water gas shift

Hall B

15:00 L60 Wilmes, Investigation of additive-manufactured catalysts in the decomposition of hydrogen peroxide

15:20 L61 Rui Hu, Nano-whisker-functionalized SiC foams coated with structured CuO/ZnO/Al₂O₃ catalysts for efficient CO₂ hydrogenation to methanol

15:40 L62 Bulejak, Additive Manufacturing of Fe catalysts by Direct Ink Writing (DIW) and their application in plasma-catalytic NH₃ decomposition

16:00-17:00 Plenary lecture (PL5): Christophe Len (Université de Technologie de Compiègne, Chimie ParisTech, CNRS): Driving safer, faster, and greener bio-based chemical production

17:00-17:30 Closing ceremony – Declaration of UCRA5 – Farewell cocktail

