

# Eurotherm Seminar 118 — Programme

## 8th May (Wednesday)

9:30 – 11:00	registration	A0
11:00 – 13:00	<b>20th Anniversary of Cooperation between AGH and SIT / opening ceremony</b>	A0
13:00 – 14:00	lunch break	A0
14:00 – 15:00	<b>session 1</b>	D16
	<b>chairperson: prof. Grzegorz Brus</b>	
14:00 – 14:30	keynote lecture 1: prof. Mikihiro Nomura <i>Development of a Hydrogen Permselective Silica Membrane and Its Application to the Thermochemical Water Splitting Method</i>	
14:30 – 15:00	keynote lecture 2: prof. Łukasz Gondek <i>Hydrogen Sorption in Amorphous and Quasicrystalline Alloys</i>	
15:00 – 15:20	coffee break	D16
15:20 – 16:35	<b>session 2: Double Degree Energy and Environmental Engineering course alumni session</b>	D16
	<b>chairperson: prof. Jacek Leszczyński</b>	
15:20 – 15:35	Greg Bond III <i>An Analysis of the Hydrokinetic Turbine in Free-Flow Conditions</i>	
15:35 – 15:50	Eryk Jasak <i>Reduction of Indoor Thermal Conditioning Energy Using the Weather Forecasting Data</i>	
15:50 – 16:05	Mateusz Mańka <i>Tuning Hydrogen Storage Properties in <math>La_{1-x}Y_xNi_{4.5}Cu_{0.5}</math> (<math>x=0.1; 0.2; 0.3; 0.4; 0.5</math>) Alloys.</i>	
16:05 – 16:20	Bartłomiej Sarwa <i>A Mathematical Model of an Off-Grid Hybrid Energy System Utilizing the Reversible Solid Oxide Fuel Cell</i>	
16:20 – 16:35	Paweł Sochański <i>Polygeneration System for Hydrogen-Containing Synthetic Fuel Production: A Techno-Economic and Environmental Assessment</i>	
16:40 – 17:50	<b>session 3: Double Degree Energy and Environmental Engineering course students poster session 1</b>	D16
	<b>chairperson: dr. Tomasz Prokop</b>	
16:40 – 16:50	Tomasz Drag <i>Heat Transfer Optimization via Finned Surface with the Use of CFD</i>	
16:50 – 17:00	Konrad Gil <i>Exploring the Joule-Thomson Effect in Gas Leak Dynamics for Improved Safety Measures</i>	

17:00 – 17:10	Michał Mytkowski <i>Analysis of Transport Phenomena in the Anode of an SOFC Fuel Cell</i>
17:10 – 17:20	Kajetan Nowak <i>Perspectives of Energy Transition in Poland with an Emphasis on Environmental, Economic and Technical Aspects</i>
17:20 – 17:30	Zofia Pizoń <i>Enhancing a Deep Learning Model for Steam Reforming Post-Reaction Mixture Prediction Using Data Augmentation Techniques</i>
17:30 – 17:40	Magdalena Prajsner <i>Application of the Electrospinning Technique in the Preparation of Selected Electrode Materials for Solid Oxide Fuel Cells</i>
17:40 – 17:50	Michał Przepiórski <i>Artificial Neural Networks as Efficient Models of Proton Exchange Membrane Fuel Cells</i>

## 9th May (Thursday)

9:20 – 9:30	<b>welcoming address by the Director of Academic Centre for Materials and Nanotechnology, prof. Marek Przybylski</b>	D16
9:30 – 10:30	<b>session 4</b> <b>chairperson: prof. Wojciech Lipiński</b>	D16
9:30 – 10:00	<u>keynote lecture 3:</u> prof. Yoshihide Suwa <i>Studies on the Safe Application Techniques of High-Pressure Hydrogen Gas</i>	
10:00 – 10:30	<u>keynote lecture 4:</u> prof. Chi-Hwa Wang <i>Solar-Driven Biomass Chemical Looping Gasification for Syngas and High-Purity Hydrogen</i>	
10:30 – 11:00	<b>session 5: technical session 1</b> <b>chairperson: prof. Wojciech Lipiński</b> dr. Martin Roeb <i>Hydrogen and Hydrocarbon Fuels from Abundant Resources and Solar Energy: Current Activities and Perspectives in DLR's Institute of Future Fuels</i>	D16
11:00 – 11:30	<b>coffee break</b>	D16
11:30 – 12:30	<b>session 6: special session 1 — membrane separation technology</b> <b>chairperson: prof. Akito Takasaki</b>	D16
11:30 – 11:45	Towa Horiguchi <i>Development of Water Vapor Recovery Membrane for Efficient Recycling System</i>	
11:45 – 12:00	Itsuki Ito <i>Alkali Composite Inorganic Membranes and Carbon Dioxide Absorption</i>	

12:00 – 12:15	Myuwako Ito <i>Development of High Hydrogen Permselective Membranes by Using a Vapor Treatment Method</i>	
12:15 – 12:30	Haruki Sato <i>Hydrogen Permselective Membrane Prepared by Plasma Treatment of Porous Ceramic Substrates</i>	
12:30 – 13:00	<b>session 7: technical session 2</b>	D16
	<b>chairperson: prof. Yoshihide Suwa</b>	
12:30 – 13:00	prof. Mirosław Karbowniczek <i>Possibilities of Decarbonization of Iron Metallurgy Processes Using Hydrogen</i>	
13:00 – 14:00	<b>lunch break</b>	Krakus
14:00 – 15:00	<b>session 8</b>	D16
	<b>chairperson: prof. Mikihiro Nomura</b>	
14:00 – 14:30	keynote lecture 5: prof. Akito Takasaki <i>Effect of Rotation Speed on Hydrogen Storage Properties of <math>Ti_{45}Zr_{38}Ni_{17}</math> Alloy Ribbons Produced by Melt Spinning</i>	
14:30 – 15:00	keynote lecture 6: prof. Wojciech Lipiński <i>Mixed Metal Oxides for Enhanced Solar Fuel Production via Thermochemical Redox Cycling</i>	
15:00 – 16:00	<b>session 9: special session 2 — hydrogen &amp; oxygen storage / production</b>	D16
	<b>chairperson: prof. Łukasz Gondek</b>	
15:00 – 15:15	dr. Kamil Goc <i>Improved Heat Transport and Hydrogen Sorption Rate in the Electric Field Aligned, Graphite/Magnesium Hydride Composites.</i>	
15:15 – 15:30	Kazuma Ishida <i>Optimization of Sol-Gel Preparation Method for <math>Y_{0.9}Ce_{0.1}MnO_{3+\delta}</math> to Improve the Oxygen Storage Properties</i>	
15:30 – 15:45	dr. Antoni Żywczak <i>Physical Properties of the TiZrM Nano-Alloy and Their Amorphous Hydrides.</i>	
15:45 – 16:15	<b>coffee break</b>	D16
16:15 – 17:15	<b>session 10: special session 3 — fuel cell technology</b>	D16
	<b>chairperson: prof. Grzegorz Brus</b>	
16:15 – 16:30	Michał Gogacz <i>Tuning High-Performance Electrode Material for Reversible Solid Oxide Cells</i>	
16:30 – 16:45	Jakub Lach <i>Influence of Dopants on Fine-Tuning the Electrochemical Properties of Samarium Barium Manganese Double Perovskites for Symmetrical Solid Oxide Cell Applications</i>	
16:45 – 17:00	dr. Tomasz Prokop <i>Thermodynamic Losses in the Evolving Microstructure of a Solid Oxide Fuel Cell Anode</i>	

17:00 – 17:15 dr. Piotr Winiarz  
*Thermal Cycling of Composite Oxygen Electrode with Negative Thermal Expansion Material for Performance Improvement of Solid Oxide Cells*

## 10th May (Friday)

9:00 – 9:30	<b>session 11</b> <b>chairperson: prof. Wojciech Lipiński</b> <u>keynote</u> lecture 7: prof. Grzegorz Brus <i>Combining First Principles and Machine Learning for Micro-Scale Modeling of a Fuel Cell Electrode</i>	
9:30 – 10:00	<b>session 12: technical session 3</b> <b>chairperson: prof. Wojciech Lipiński</b> Dominik Gryboś <i>Management of Compressed Air Expansion Dynamics in Piston Expander by Pressure and Heat Impingement</i>	D16
10:00 – 10:30	<b>coffee break</b>	
10:30 – 11:30	<b>session 13: Double Degree Energy and Environmental Engineering course students poster session 2</b> <b>chairperson: dr. Marcin Moździerz</b>	D16
10:30 – 10:40	Dawid Szemraj <i>CFD Modelling and Analysis of an ORC Turbine with Backswept Rotor Blades</i>	
10:40 – 10:50	Oskar Śledź <i>Analysis of the Possibility of Increasing Self-Consumption of Energy from PV Installations</i>	
10:50 – 11:00	Paweł Wiącek <i>Experimental Study on Gas Leak Detection Using Thermal Imaging and Machine Learning</i>	
11:00 – 11:10	Aleksander Woźniak <i>Utilizing Machine Learning Techniques to Automatically Detect Anomalies on Shewhart Control Charts</i>	
11:10 – 11:20	Patryk Wszyński <i>Analysis of Combustion Models for Hydrogen-Air Mixtures using ANSYS FLUENT</i>	
11:20 – 11:30	Michał Zańczak <i>Investigation of the Water Pump Operation Using a Developed CFD Model</i>	
11:30 – 13:00	<b>session 14: poster session</b> <b>chairperson: dr. Marcin Moździerz</b>	D16
13:00 – 13:30	<b>closing ceremony</b> <b>chairperson: prof. Janusz Szmyd</b>	D16
13:30 – 14:30	<b>lunch break</b>	Krakus
18:00 – 20:00	<b>conference dinner</b>	Krakus

### venue legend:

- A0: AGH's main building (see <https://eurotherm118.agh.edu.pl/seminar-venue/>, pin: <https://maps.app.goo.gl/PFEuieUuxS4qbJ6DA>)
- D16: Academic Centre for Materials and Nanotechnology (see <https://eurotherm118.agh.edu.pl/seminar-venue/>, pin: <https://maps.app.goo.gl/Y2vEF3p1WiH4DoMd6>)
- Krakus – Restaurant “Krakus”, Reymonta 15 (pin: <https://maps.app.goo.gl/xzLT3LD3Q2qcbySp8>)

### poster session

S01	Tomasz Drag, Mieszko Tokarski	Heat Transfer Optimization via Finned Surface with the Use of CFD
S02	Konrad Gil, Paweł Wiącek, Marcin Moździerz, Grzegorz Brus	Exploring the Joule-Thomson Effect in Gas Leak Dynamics for Improved Safety Measures
S03	Michał Mytkowski, Tomasz Aleksander Prokop	Analysis of Transport Phenomena in the Anode of an SOFC Fuel Cell
S04	Kajetan Nowak, Justyna Michalak, Daria Złotecka	Perspectives of Energy Transition in Poland with an Emphasis on Environmental, Economic and Technical Aspects
S05	Zofia Pizoń, Shinji Kimijima, Grzegorz Brus	Enhancing a Deep Learning Model for Steam Reforming Post-Reaction Mixture Prediction Using Data Augmentation Techniques
S06	Magdalena Prajsner, Piotr Winiarz	Application of the Electrospinning Technique in the Preparation of Selected Electrode Materials for Solid Oxide Fuel Cells
S07	Michał Przepiórski, Marcin Moździerz	Artificial Neural Networks as Efficient Models of Proton Exchange Membrane Fuel Cells
S08	Dawid Szemraj, Marcin Jankowski	CFD Modelling and Analysis of an ORC Turbine with Backswept Rotor Blades
S09	Oskar Śledź, Andrzej Raźniak	Analysis of the Possibility of Increasing Self-Consumption of Energy from PV Installations
S10	Paweł Wiącek, Szymon Buchaniec, Grzegorz Brus	Experimental Study on Gas Leak Detection Using Thermal Imaging and Machine Learning
S11	Aleksander Woźniak	Utilizing Machine Learning Techniques to Automatically Detect Anomalies on Shewhart Control Charts
S12	Patryk Wyszynski, Rafał Porowski	Analysis of Combustion Models for Hydrogen-Air Mixtures using ANSYS FLUENT
S13	Michał Zańczak, Rafał Buczyński	Investigation of the Water Pump Operation Using a Developed CFD Model

P01	Paweł Boguszewicz, Michał Wierzbicki, Marek Skrzypkiewicz	Innovative Approach to High-Efficiency SOC Stack Testing Stand without Heating Chamber: Computational Analysis and Validation
P02	Szymon Buchanec, Marcin Moździerz, Hiroshi Hasegawa, Grzegorz Brus	Design of Experiments in the Optimization of Solid Oxide Fuel Cells Microstructures
P03	Artur Harutyunyan, Krzysztof Badyda, Łukasz Szablowski	Energy and Exergy Analysis of Hydrogen Powered Gas Turbines Operating in Simple and Gas-Steam Systems
P04	Piotr Kubala, Dominik Gryboś, Jacek Leszczynski, Jan Markowski	Comparison of Methods for Discharging an Isochoric Compressed Air Tank in Compressed Air Energy Storage Systems.
P05	Marcin Moździerz, Grzegorz Brus	Microstructural Tailoring for Improved Solid Oxide Fuel Cell Stack Performance
P06	Marcin Pająk, Krzysztof Makięta, Janusz Szmyd, Hiroshi Hasegawa, Grzegorz Brus	Reducing Theoretical Pressure Drop in Small-Scale Methane Steam Reforming with Genetic Algorithm Optimization
P07	Amir Sultan, Muhammad Bilal Hanif ,Kun Zheng Erica Stanzani, Rafał Porowski, Tomasz Gorzelnik, Ernesto Salzano	Effect of Mo-Doping on Proton-Conducting $Ba_1Ce_{0.9-x}Mo_xY_{0.1}O_{3-\delta}$ Electrolyte at Intermediate Temperature SOFCs: Microstructural and Electrical Properties Self-Ignition of Hydrogen Released Into the Atmosphere
P08	Amir Sultan, Muhammad Bilal Hanif ,Kun Zheng	Effect of Mo-Doping on Proton-Conducting $Ba_1Ce_{0.9-x}Mo_xY_{0.1}O_{3-\delta}$ Electrolyte at Intermediate Temperature SOFCs: Microstructural and Electrical Properties
P09	Jakub Szczurowski, Patryk Bartulik, Małgorzata Hasal, Katarzyna Zarębska	Development of Carbon-MOF Composites for Direct Air Capture