



**SIT—AGH Symposium on Energy and Environmental Engineering  
Tokyo, 13–15 July 2026**



# Program



**POLISH** NATIONAL AGENCY  
FOR ACADEMIC EXCHANGE

# SIT — AGH Symposium on Energy and Environmental Engineering

## Tokyo, 13–15 July 2026

Centennial Main Building, Shibaura Institute of Technology  
3-7-5 Toyosu, Koto-ku, Tokyo 135-8548

## Program

### 13th July (Monday)

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|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 10:00 – 10:20 | <b>Opening ceremony</b> (Chairperson: Alicja Klimkowicz, Marcin Moździerz)<br><b>Opening Address</b><br>Tadahiro Hasegawa, Dean, Graduate School of Engineering and Science                 | Adegawa Theater |
| 10:20 – 12:00 | <b>Session No. 1</b> (Chairperson: Alicja Klimkowicz)                                                                                                                                       | Adegawa Theater |
| 10:20 – 11:00 | Keynote Lecture <b>Shozo Kaneko</b><br>HYGREEN PROJECT—BRIDGING RENEWABLE ENERGY AND COAL                                                                                                   | K1              |
| 11:00 – 11:30 | Invited Lecture <b>Jacek Leszczyński</b><br>MICRO-CASES MODULE IN HYBRID STORAGE TECHNOLOGIES FOR CRITICAL INFRASTRUCTURE SUPPLY                                                            | I1              |
| 11:30 – 12:00 | Invited Lecture <b>Paweł Gładysz</b><br>POTENTIAL AND DEVELOPMENT OF CCUS TECHNOLOGIES IN POLAND: A SYSTEMATIC TECHNO-ECONOMIC AND ENVIRONMENTAL ASSESSMENT                                 | I2              |
| 12:00 – 13:00 | <i>Lunch break</i>                                                                                                                                                                          |                 |
| 13:00 – 14:45 | <b>Session No. 2</b> (Chairperson: Jacek Leszczyński)                                                                                                                                       | 2304 classroom  |
| 13:00 – 13:30 | Invited Lecture <b>Szymon Buchaniewicz</b><br>THE COST OF SIMPLIFICATION: ACCURACY LOSS IN BATTERY MODELS                                                                                   | I3              |
| 13:30 – 13:45 | <b>Julia Świdorska</b><br>REINVENTING SOLAR MOBILITY: LIGHTWEIGHT COMPOSITE PV MODULES FOR FUTURE VEHICLES                                                                                  | O1              |
| 13:45 – 14:00 | <b>Maciej Trzeja</b><br>A COMPUTATIONALLY EFFICIENT ALGORITHM FOR ANALYZING BIOGAS UPGRADING VIA THE SABATIER REACTION                                                                      | O2              |
| 14:00 – 14:15 | <b>Adam Rokosz</b><br>ELECTROSPUN PEROVSKITE NANOFIBERS WITHIN SITU EXSOLVED MULTICOMPONENT NANOCATALYSTS AS DURABLE HIGH PERFORMANCE SOFC ELECTRODES FOR AI DATA CENTRE POWER APPLICATIONS | O3              |
| 14:15 – 14:30 | <b>Jakub Emerla</b><br>NUMERICAL ANALYSIS OF THE HYDROGEN SUPPLY SYSTEM FOR PEM FUEL CELL IN THE HYDRIVE RACE CAR                                                                           | O4              |
| 14:30 – 14:45 | <b>Wiktoria Fabian</b><br>THE IMPACT OF THE EU EMISSIONS TRADING SYSTEM (ETS II) ON HOUSEHOLDS AND SOCIETAL INEQUALITIES: IMPLICATIONS FOR GLOBAL CARBON PRICING POLICIES                   | O5              |
| 14:45 – 15:00 | <i>Short break</i>                                                                                                                                                                          |                 |
| 15:00 – 17:00 | <b>Session No. 3</b> (Chairperson: Paweł Gładysz)                                                                                                                                           | 2304 classroom  |
| 15:00 – 15:30 | Invited Lecture <b>Takuma Kogawa</b><br>VISUALIZATION AND SPATIOTEMPORAL ANALYSIS OF NATURAL CONVECTION STRUCTURES USING BACKGROUND-ORIENTED SCHLIEREN METHOD                               | I4              |
| 15:30 – 16:00 | <b>Marcin Moździerz</b><br>STATISTICAL ANALYSIS OF SYNTHETIC MICROSTRUCTURES FOR SOLID OXIDE FUEL CELL ANODE                                                                                | O6              |
| 16:00 – 16:15 | <b>Kyogo Koyama</b><br>DEVELOPMENT OF HYDROGEN PERMEABLE SELECTIVE MEMBRANE BY USING AN IMMERSING METHOD                                                                                    | O7              |
| 16:15 – 16:30 | <b>Yuta Nakai</b><br>DEHYDRATION OF SALT SOLUTIONS THROUGH MOR ZEOLITE MEMBRANES                                                                                                            | O8              |
| 16:30 – 16:45 | <b>Reina Akiya</b><br>DEVELOPMENT OF MFI ZEOLITE MEMBRANES WITH OZONE SWEEPING                                                                                                              | O9              |

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| 16:45 – 17:00 | <b>Yuka Shimizu</b><br>CONTROL OF CO <sub>2</sub> METHANATION BY USING THE MEMBRANE REACTOR | O1<br>0 |
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**14th July (Tuesday)**

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| <b>9:30 – 11:20</b>  | <b>Session No. 4 (Chairperson: Takuma Kogawa)</b>                                                                                                                                     | <b>2402 classroom</b> |
| 9:30 – 10:10         | Keynote lecture <b>Ayako Yamamoto</b><br>DEVELOPMENT OF FUNCTIONAL CERAMICS USING THE HIGH-ENTROPY CONCEPT                                                                            | K2                    |
| 10:10 – 10:50        | Keynote lecture <b>Izabela Rzeźnicka</b><br>FROM LIGNIN TO FUNCTIONAL CARBON MATERIALS AND VALUE-ADDED CHEMICALS: SUSTAINABLE PATHWAYS FOR ENERGY CONVERSION AND BIOMASS VALORIZATION | K3                    |
| 10:50 – 11:20        | <b>Tomasz Prokop</b><br>ENHANCING THE INTERLAYER IN NI-GDC COMPOSITE FUEL ELECTRODES                                                                                                  | O11                   |
| <b>11:20 – 12:30</b> | <i>Lunch break</i>                                                                                                                                                                    |                       |
| <b>12:30 – 14:00</b> | <b>Session No. 5 (Chairperson: Ayako Yamamoto)</b>                                                                                                                                    | <b>2402 classroom</b> |
| 12:30 – 12:45        | <b>Michalina Kasprzyk</b><br>MATHEMATICAL MODELING OF VOLTAGE FLUCTUATIONS IN POWER SYSTEMS WITH PHOTOVOLTAIC GENERATION                                                              | O12                   |
| 12:45 – 13:00        | <b>Grzegorz Kukiełka</b><br>ANALYSIS OF STEAM/METHANE REFORMER WITH OPTIMIZATION OF CATALYST DISTRIBUTION USING MATLAB WITH PHYSICAL MODEL VERIFICATION                               | O13                   |
| 13:00 – 13:15        | <b>Wiktor Krzewiński</b><br>REINFORCEMENT LEARNING SCALED AERODYNAMIC SHAPE OPTIMIZATION USING DISCRETE ADJOINT METHOD                                                                | O14                   |
| 13:15 – 13:30        | <b>Aleksandra Kogut</b><br>EXPERIMENTAL EVALUATION OF ALUMINUM ALLOY 6000 SERIES                                                                                                      | O15                   |
| 13:30 – 13:45        | <b>Julia Zalega</b><br>HYBRID MEMBRANE AND PRESSURE SWING ADSORPTION BIOGAS PURIFICATION SYSTEM SIMULATION                                                                            | O16                   |
| 13:45 – 14:00        | <b>Jakub Ściga</b><br>COMPUTATIONAL ANALYSIS OF WATER SPRAY INJECTION IN GAS EXPANSION DYNAMICS                                                                                       | O17                   |
| <b>14:00-14:30</b>   | <i>short break</i>                                                                                                                                                                    |                       |
| <b>14:30-15:45</b>   | <b>Session No. 6 (Chairperson: Izabela Rzeźnicka)</b>                                                                                                                                 | <b>2402 classroom</b> |
| 14:30-14:45          | <b>Maksymilian Furgał</b><br>IMPACT OF ENERGY EFFICIENCY DIRECTIVES ON POLISH SMALL DISTRICT HEATING SYSTEMS                                                                          | O18                   |
| 14:45-15:00          | <b>Natalia Dulęba</b><br>DETERMINATION OF THE MOST EFFICIENT OPERATING CONDITIONS FOR SUSTAINABLE HYDROGEN PRODUCTION                                                                 | O19                   |
| 15:00-15:15          | <b>Małgorzata Hasal</b><br>SYNTHESIS AND CHARACTERIZATION OF CARBON NANODOTS FOR ENVIRONMENTAL APPLICATIONS                                                                           | O20                   |
| 15:15-15:30          | <b>Jean Paul Cardona Murillo</b><br>STUDY OF THE HEAT DISSIPATION POTENTIAL OF AN ELECTROHYDRODYNAMIC DEVICE                                                                          | O21                   |
| 15:30-15:45          | <b>Oskar Stąporek</b><br>COMPUTER ANALYSIS OF COOLANT INJECTION INTO A PISTON COMPRESSOR                                                                                              | O22                   |
| <b>15:45-16:00</b>   | <i>break</i>                                                                                                                                                                          |                       |
| <b>16:00-18:00</b>   | <b>Session No. 7 (Chairperson: Alicja Klimkowicz, Marcin Moździerz)</b><br><b>Poster Session</b>                                                                                      | <b>2403 classroom</b> |

**15th July (Wednesday)**

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| <b>9:00-10:50</b>    | <b>Session No. 8 (Chairperson Marcin Moździerz)</b>                                                                                  | <b>2403</b>           |
|                      | <b>classroom</b>                                                                                                                     |                       |
| 9:00 – 9:40          | Keynote Lecture <b>Wojciech Lipiński</b><br>TRANSPORT PHENOMENA IN HIGH-TEMPERATURE SOLAR REACTIVE FLOWS                             | K5                    |
| 9:40 – 10:20         | Keynote lecture <b>Paolo Mele</b><br>NANODEFFECTS AS ENERGY ENABLERS: HIGH-PERFORMANCE THIN-FILM SUPERCONDUCTORS AND THERMOELECTRICS | K4                    |
| 10:20 – 10:50        | <b>Klimkowicz Alicja</b><br>OXYGEN PRODUCTION USING TEMPERATURE PRESSURE SWING ABSORPTION                                            | O23                   |
| <b>10:50 – 11:15</b> | <i>break</i>                                                                                                                         |                       |
| <b>11:15 – 13:00</b> | <b>Session No. 9 (Chairperson Paweł Gładysz)</b>                                                                                     | <b>2403 classroom</b> |
| 11:15 – 11:30        | <b>Padma Saini</b><br>OPTIMIZATION OF FLUX PINNING AND SUPERCONDUCTING PROPERTIES OF BULK $\text{MgB}_2$ VIA HOLMIUM OXIDE ADDITION  | O24                   |
| 11:30 – 11:45        | <b>Mizuki Shimura</b><br>HYDROTHERMAL STABILITY OF HYDROGEN PERMSELECTIVE MEMBRANES                                                  | O25                   |
| 11:45 – 12:00        | <b>Myu Yamauchi</b><br>EFFECTS OF SALT ON ETHANOL PERMEATION THROUGH MFI ZEOLITE MEMBRANES                                           | O26                   |
| 12:00 – 12:15        | <b>Shoma Tanaka</b><br>DEVELOPMENT OF HIGH TEMPERATURE $\text{CO}_2$ PERMSELECTIVE MEMBRANE MATERIALS                                | O27                   |
| 12:15 – 12:30        | <b>Taichi Tomizuka</b><br>EFFECTS OF CATALYSIS PREPARATION ON HYDROGEN PRODUCTION BY USING SULFUR DIOXIDE                            | O28                   |
| 12:30 – 12:45        | <b>Roi Matsuo</b><br>OLEFIN SYNTHESIS THROUGH CHA ZEOLITE MEMBRANES                                                                  | O29                   |
| 12:45 – 13:00        | <b>Ryo Murakami</b><br>DEVELOPMENT OF MEMBRANE DISTILLATION MEMBRANES BY ALKOXIDES TREATMENT                                         | O30                   |
| <b>13:00 – 13:15</b> | <b>Closing ceremony (Alicja Klimkowicz, Marcin Moździerz)</b>                                                                        | <b>2403 classroom</b> |

# SIT — AGH Symposium on Energy and Environmental Engineering

## Tokyo, 14 July 2026 16:00-18:00

### Poster Session

| No. | Presenter's name          | Title                                                                                                                                                                  | 2403 classroom |
|-----|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| O1  | Julia Świdarska           | REINVENTING SOLAR MOBILITY: LIGHTWEIGHT COMPOSITE PV MODULES FOR FUTURE VEHICLES                                                                                       |                |
| O2  | Maciej Trzeja             | A COMPUTATIONALLY EFFICIENT ALGORITHM FOR ANALYZING BIOGAS UPGRADING VIA THE SABATIER REACTION                                                                         |                |
| O3  | Adam Rokosz               | ELECTROSPUN PEROVSKITE NANOFIBERS WITH IN SITU EXSOLVED MULTICOMPONENT NANOCATALYSTS AS DURABLE HIGH PERFORMANCE SOFC ELECTRODES FOR AI DATA CENTRE POWER APPLICATIONS |                |
| O4  | Jakub Emerla              | NUMERICAL ANALYSIS OF THE HYDROGEN SUPPLY SYSTEM FOR PEM FUEL CELL IN THE HYDRIVE RACE CAR                                                                             |                |
| O5  | Wiktoria Fabian           | THE IMPACT OF THE EU EMISSIONS TRADING SYSTEM (ETS II) ON HOUSEHOLDS AND SOCIETAL INEQUALITIES: IMPLICATIONS FOR GLOBAL CARBON PRICING POLICIES                        |                |
| O7  | Kyogo Koyama              | DEVELOPMENT OF HYDROGEN PERMSELECTIVE MEMBRANE BY USING AN IMMERSING METHOD                                                                                            |                |
| O8  | Yuta Nakai                | DEHYDRATION OF SALT SOLUTIONS THROUGH MOR ZEOLITE MEMBRANES                                                                                                            |                |
| O9  | Reina Akiya               | DEVELOPMENT OF MFI ZEOLITE MEMBRANES WITH OZONE SWEEPING                                                                                                               |                |
| O10 | Yuka Shimizu              | CONTROL OF CO <sub>2</sub> METHANATION BY USING THE MEMBRANE REACTOR                                                                                                   |                |
| O12 | Michalina Kasprzyk        | MATHEMATICAL MODELING OF VOLTAGE FLUCTUATIONS IN POWER SYSTEMS WITH PHOTOVOLTAIC GENERATION                                                                            |                |
| O13 | Grzegorz Kukielka         | ANALYSIS OF STEAM/METHANE REFORMER WITH OPTIMIZATION OF CATALYST DISTRIBUTION USING MATLAB WITH PHYSICAL MODEL VERIFICATION                                            |                |
| O14 | Wiktor Krzewiński         | REINFORCEMENT LEARNING SCALED AERODYNAMIC SHAPE OPTIMIZATION USING DISCRETE ADJOINT METHOD                                                                             |                |
| O15 | Aleksandra Kogut          | EXPERIMENTAL EVALUATION OF ALUMINUM ALLOY 6000 SERIES                                                                                                                  |                |
| O16 | Julia Zalega              | HYBRID MEMBRANE AND PRESSURE SWING ADSORPTION BIOGAS PURIFICATION SYSTEM SIMULATION                                                                                    |                |
| O17 | Jakub Ściga               | COMPUTATIONAL ANALYSIS OF WATER SPRAY INJECTION IN GAS EXPANSION DYNAMICS                                                                                              |                |
| O18 | Maksymilian Furgał        | IMPACT OF ENERGY EFFICIENCY DIRECTIVES ON POLISH SMALL DISTRICT HEATING SYSTEMS                                                                                        |                |
| O19 | Natalia Dulęba            | DETERMINATION OF THE MOST EFFICIENT OPERATING CONDITIONS FOR SUSTAINABLE HYDROGEN PRODUCTION                                                                           |                |
| O20 | Małgorzata Hasal          | SYNTHESIS AND CHARACTERIZATION OF CARBON NANODOTS FOR ENVIRONMENTAL APPLICATIONS                                                                                       |                |
| O21 | Jean Paul Cardona Murillo | STUDY OF THE HEAT DISSIPATION POTENTIAL OF AN ELECTROHYDRODYNAMIC DEVICE                                                                                               |                |
| O22 | Oskar Stąporek            | COMPUTER ANALYSIS OF COOLANT INJECTION INTO A PISTON COMPRESSOR                                                                                                        |                |
| O25 | Mizuki Shimura            | HYDROTHERMAL STABILITY OF HYDROGEN PERMSELECTIVE MEMBRANES                                                                                                             |                |
| O26 | Myu Yamauchi              | EFFECTS OF SALT ON ETHANOL PERMEATION THROUGH MFI ZEOLITE MEMBRANES                                                                                                    |                |
| O27 | Shoma Tanaka              | DEVELOPMENT OF HIGH TEMPERATURE CO <sub>2</sub> PERMSELECTIVE MEMBRANE MATERIALS                                                                                       |                |
| O28 | Taichi Tomizuka           | EFFECTS OF CATALYSIS PREPARATION ON HYDROGEN PRODUCTION BY USING SULFUR DIOXIDE                                                                                        |                |
| O29 | Roi Matsuo                | OLFIN SYNTHESIS THROUGH CHA ZEOLITE MEMBRANES                                                                                                                          |                |
| O30 | Ryo Murakami              | DEVELOPMENT OF MEMBRANE DISTILLATION MEMBRANES BY ALKOXIDES TREATMENT                                                                                                  |                |
| P1  | Nonoka Motoya             | CO <sub>2</sub> ADSORPTION ON A LAYERED DOUBLE HYDROXIDE                                                                                                               |                |
| P2  | Soma Aoki                 | MFI ZEOLITE SYNTHESIS FOR NANO-SHEET SEED CRYSTALS                                                                                                                     |                |
| P3  | Hirotake Ono              | METHANE SYNTHESIS BY USING A DISTRIBUTOR TYPE MEMBRANE REACTOR                                                                                                         |                |
| P4  | Yuki Konno                | METHANOL PRODUCTION FROM CARBON DIOXIDE THROUGH CONTACTOR TYPE REACTOR                                                                                                 |                |
| P5  | Yuya Suzuki               | POST-TREATMENT OF SIC-DERIVED CARBON NANOTUBE MEMBRANES FOR NANOPORE FORMATION AND MOLECULAR SEPARATION                                                                |                |
| P6  | Nahori Taniguchi          | TEMPERATURE DEPENDENCE FOR HYDROGEN PRODUCTION BY HYBRID SULFUR SYSTEM                                                                                                 |                |
| P7  | Gao Yao                   | EFFECT OF OPERATING MODES ON PATTERNED AND COMPOSITE NI-GDC ELECTRODES IN SOLID OXIDE CELLS                                                                            |                |
| P8  | Tianyang Fang             | DEEP-LEARNING-ASSISTED 3D MICROSTRUCTURE ANALYSIS OF NVP-NZSP ALL-SOLID-STATE SODIUM BATTERIES                                                                         |                |



