

International H₂ Summer School

Second Edition

At University of Porto – FEUP, Portugal

5th – 8th September, 2022



PROGRAM: Electrochemistry and H₂ Purification

DAY 1

08:30 – 09:00

Registration

09:00 – 09:10

Opening: Introduction to the H₂ Summer School

09:10 – 10:10

The EU Roadmap to Hydrogen Economy

Prof. Adélio Mendes (FEUP, Portugal)

10:10 – 10:25

Discussion



10:25 – 10:45

COFFEE BREAK

10:45 – 11:45

Electrochemistry: Fundamentals and Characterization Techniques

11:45 – 12:00

Prof. Ulrich Stimming (TUM, Germany)

Discussion



12:00 – 13:00

LUNCH

13:00 – 13:05

Power-to-X

13:05 – 14:05

Water Electrolysis AEM vs. PEM

Prof. Andreas Friedrich (DLR, Germany)

14:05 – 14:20

Discussion



14:20 – 15:20

Membrane Engineering in H₂ Generation and Purification

Dr. Adolfo Iulianelli (ITM-CNR, Italy)

15:20 – 15:35

Discussion



Funded by the Horizon 2020 Framework Programme of the European Union.

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PROGRAM: Electrochemistry and H₂ Purification

DAY 1

15:35 – 15:55

COFFEE BREAK

Hydrogen Purification

15:55 – 16:25

CO₂ Electroreduction

Dr. Jorge Ferreira (Tu Berlin, Germany)

16:25 – 16:35

Discussion

16:35 – 17:05

Hydrogen from different sources and its purification
by Pressure Swing Adsorption technology

Dr. Frederico Relvas (AmnisPura, Portugal)

17:05 – 17:15

Discussion

17:15 – 17:45

Carbon Molecular Seave Membranes

Prof. Adélio Mendes (FEUP, Portugal)

17:45 – 17:55

Discussion



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PROGRAM: Fuel Cells and Photoelectrochemical Cells

DAY 2

09:00 – 09:05 **Opening: H₂ Production through Fuel Cells**

09:05 – 10:05 Solid Oxide Cells & *Power-to-X*

Dr. Rémi Costa (DLR, Germany)

10:05 – 10:20 Discussion

10:20 – 10:35 COFFEE BREAK

10:35 – 11:20 Intermediate temperature Fuel Cells

Tiago Lagarteira (FEUP, Portugal)

11:20 – 11:35 Discussion

11:35 – 12:20 Low-temperature Fuel Cells

Dr. Paulo Ribeirinha (FEUP, Portugal)

12:20 – 12:35 Discussion

12:35 – 13:35 LUNCH

13:35 – 13:40 **Solar-assisted H₂ Production**

13:40 – 14:40 Mesoscopic photosystems for the generation of electricity and fuels from sunlight

Prof. Michael Grätzel (EPFL, Switzerland)

14:40 – 14:55 Discussion



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PROGRAM: Fuel Cells and Photoelectrochemical Cells

DAY 2

14:55 – 15:25

PEC Applications: Devices and Upscaling

Dr. Paula Dias (FEUP, Portugal)

15:25 – 15:35

Discussion

15:35 – 15:55

COFFEE BREAK

15:55 – 16:25

Design guidelines for competitive photo-electrochemical devices and systems

Prof. Sophia Haussener (EPFL, Switzerland)

16:25 – 16:35

Discussion

16:35 – 17:05

Solar production technologies: fundamental science and physical-chemical characterization

Prof. Elizabeth Gibson (Newcastle University, UK)

17:05 – 17:15

Discussion



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PROGRAM: Catalytic Methane Decomposition

DAY 3

09:00 – 09:05 **Opening: Catalytic Methane Decomposition**

09:05 – 09:35 Carbon: Properties and Applications

Prof. Adélio Mendes (FEUP, Portugal)

09:35 – 09:50 Discussion

09:50 – 10:20 Design of carbon materials with tuned surface and textural properties

Prof. Fernando Pereira (FEUP, Portugal)

10:20 – 10:35 Discussion

10:35 – 10:50 COFFEE BREAK

10:50 – 11:50 Tandem catalysis for power-to-commodity chemicals processes

11:50 – 12:05 *Dr. Gonzalo Prieto (ITQ, Spain)*

Discussion

12:05 – 13:05 LUNCH

13:05 – 13:10 **Catalytic Methane Decomposition**

13:10 – 14:10 DFT: Modelling Methods

Dr. Simone Pfeifer (EPFL, Switzerland)

14:10 – 14:25 Discussion



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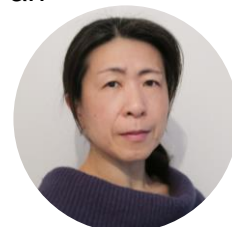
PROGRAM: Catalytic Methane Decomposition

DAY 3

14:25 – 14:55

Development of Proton Conducting Ceramic Cells in an Innovative Metal Supported Architecture and Its Application to Hydrogen Pumping

Dr. Noriko Sata (DLR, Germany)



14:55 – 15:05

Discussion

15:05 – 15:35

Life Cycle Assessment of H₂ Production

Dr. Ancelin Coulin and Dorian Marchal (Quantis, Switzerland)

15:35 – 15:45

Discussion



15:45 – 16:05

COFFEE BREAK

16:05 – 16:35

H₂ in Steel Production

Ingo Both (Paul Wurth, Germany)



16:35 – 16:45

Discussion

16:45 – 17:15

Doping Carbon on Concrete and Cements

João Santos (IST, Portugal)

17:15 – 17:25

Discussion