International H_2 Summer School

Second Edition

At University of Porto – FEUP, Portugal

5th – 8th September, 2022

PROGRAM: Electrochemistry and H_2 Purification

DAY 1

08:30 – 09:00	Registration
09:00 – 09:10	**Opening: Introduction to the H_2 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 *Prof. Ulrich Stimming* **(TUM, Germany)**
11:45 – 12:00	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 H_2 Generation and Purification *Dr. Adolfo Iulianelli* **(ITM-CNR, Italy)**
15:20 – 15:35	Discussion

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DAY 1

15:35 – 15:55	COFFEE BREAK
	Hydrogen Purification
15:55 – 16:25	CO_2 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: H_2 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 H_2 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 *Dr. Gonzalo Prieto* **(ITQ, Spain)**
11:50 – 12:05	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 H_2 Production *Dr. Ancelin Coulin and Dorian Marchal* **(Quantis, Switzerland)**
15:35 – 15:45	Discussion
15:45 – 16:05	COFFEE BREAK
16:05 – 16:35	H_2 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

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