

FEMS EUROMAT23

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FEMS EUROMAT is the most important international congress in materials science and technology in Europe. It continues a successful congress series promoting the transfer of knowledge and the exchange of experience between academia and industry. **Extended submission deadline: 15 March 2023**

E: Energy and Transportation

Until recently, the development of civilization has been pursued without foresight, in the illusion that natural resources were infinite and that the environment could absorb easily all the waste products of human activities. These assumptions proved wrong, and humankind is currently striving to change radically the paradigm of development towards a sustainable future. Energy is a major player in shaping our society since it is a key enabler of most technologies, with a particular reference to transportation, a major consumer of energy both in production and use. As of today, major efforts are devoted at the global level to radically change the energy system. A traditional scenario where energy is mostly obtained from non-renewable fossil fuels, triggering massive emissions of greenhouse gases and leading to catastrophic global warming, is progressively being superseded by a completely new paradigm. In this latter, energy is obtained from renewable sources, and the spatial/temporal gaps between energy availability and use are closed effectively by a variety of approaches, including the implementation of the "hydrogen economy" and the development of "smart grids".

This Area is meant to provide a cross-section of the completely new and diverse set of technologies that are currently under development to realize such an "energy transition". The perspective is thus primarily on applications rather than individual classes of materials or processes. The electrical energy obtained from renewable sources, e.g., the sun is distributed in "smart grids", wherein it can be stored through a variety of technologies, including secondary batteries and redox flow batteries. The "hydrogen economy" exploits hydrogen as the vector for renewable energy and can be integrated seamlessly into "smart grids"; its cornerstones are fuel cells and electrolyzers that typically adopt either acidic or alkaline chemistries. Finally, renewable electricity is used to power a variety of innovative vehicles (e.g., cars, trucks, boats, airplanes and even spacecrafts) running on secondary batteries or fuel cells. Such vehicles must be designed implementing completely new materials able to satisfy the unique requirements prompted by the use of radically new electric power plants while at the same time maintaining and furthering standards in lightweight design as a secondary means to limit energy needs.

Area Coordinator



Prof. Dr. Vito Di Noto
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Dr. Dirk Lehmhus
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E01: Advanced Materials for Transport Applications

Dr. René C. Alderliesten (Delft University of Technology), Prof. Dr. Joachim M. Hausmann (Leibniz-Inst. für Verbundwerkstoffe GmbH), Dr. Jörg Hohe (Fraunhofer Institute IWM), Kambiz Kayvantash (CADLM), Dr. Dirk Lehmhus (Fraunhofer Institute IFAM), Prof. Dr.-Ing. Axel von Hehl (University of Siegen)

E02: Photovoltaics: Materials Science and Perspectives

Prof. Dr. Aldo Di Carlo (University of Roma Tor Vergata), Prof. Dr. Emmanuel Kymakis (Hellenic Mediterranean University), Dr. Pedro Salomé (INL - Intern. Iberian Nanotechnology Lab.)

E03: Materials for Space Applications and Extreme Environments

Dr. Donatella Giuranno (National Research Council), Dr. Rada Novakovic (National Research Council), Prof. Dr.-Ing. Ilya Okulov (Leibniz Institute IWT), Dr. Wojciech Polkowski (Łukasiewicz - Krakow Institute of Technology)

E04: Redox Flow Batteries

Prof. Dr. Vito Di Noto (University of Padova), Dr. rer.nat. Peter Fischer (Fraunhofer Institute ICT), Prof. Dr. Anthony Kucernak (Imperial College London), Prof. Dr. Pawel J. Kulesza (University of Warsaw)

E05: Lithium Batteries

Prof. Dr. Chiara Ferrara (University of Milano-Bicocca), Dr. Gioele Pagot (University of Padova), Prof. Dr. Riccardo Ruffo (University of Milano-Bicocca)

E06: Beyond Lithium Batteries

Prof. Dr. Vito Di Noto (University of Padova), Prof. Dr. Max DGM tner (Karlsruhe Institute of Technology (KIT)), Prof. Dr. Stefano Passerini (Helmholtz Institute Ulm (HIU))



E07: Anion Exchange Membrane Fuel Cells and Electrolyzers

Prof. Dr. Nicolas Alonso-Vante (Université de Poitiers), Prof. Dr. Dario Dekel (Technion - Israel Institute of Technology), Prof. Dr. Vito Di Noto (University of Padova)

E08: Proton Exchange Membrane Fuel Cells and Electrolyzers

Prof. Dr. Piercarlo Mustarelli (University of Milano-Bicocca), Prof. Dr. Enrico Negro (University of Padova), Prof. Dr. Carlo Santoro (University of Milano-Bicocca)

E09: Energy Materials - Characterization and Modeling

Prof. Dr. Daniel Brandell (Uppsala University), Prof. Dr. Leeor Kronik (Weizmann Institute of Science), Prof. Dr. Ellen Moons (Karlstad University), Prof. Dr. Eva Unger (Helmholtz-Zentrum Berlin)