

# FEMS EUROMAT23

03 - 07 Sep 2023 (Frankfurt)

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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. **Submission deadline: 31 January 2023**

Area E: Energy and Transportation

## E03: Materials for Space Applications and Extreme Environments

This symposium will offer an opportunity for scientists to present and discuss the results of their research through oral and/or poster presentations exchanging knowledge, ideas, and opinions between participants. It also will be a good opportunity for early career researchers and students to learn about the current state of research from experts in the field. Highly demanding applications include the design, development, and testing of new materials having long-term stability in the harsh environment of space and in other extreme conditions such as those of high-temperature corrosion. Concerning Materials for Space Applications, the International Space Station (ISS) allows testing of material properties and control of experimental conditions to an extent impossible on Earth. Since 2018, The Materials International Space Station Experiments Flight Facility (MISSE-FF) has enabled the integrated testing of materials' behavior under extreme conditions such as those in low Earth orbit, including ultraviolet, electromagnetic and ionizing radiations, thermal cycles, ultrahigh vacuum, charged particles, impacts, etc. Moreover, the forthcoming space missions aiming to create new habits on the Moon and into deep space, as well as the Mars exploration program, are opening new challenges for materials scientists in enabling in-situ efficient power generation, manufacturing, and repairing, water recycling, food and energy storage facilities. The symposium will include experimental and theoretical contributions related to scientific and technological subjects interesting for Space and extreme environments applications. Beyond this general scope, specific topics are highlighted in the following to provide focal points for contributions and realize dedicated sessions covering the respective areas. Such suggested session topics include:

- Ultra Light-weight materials for space exploration (Mg-based, Polymers, etc.)
- Advanced structural materials for space environments and human protection
- Advanced materials for space exploration: Metal- and Ceramic-matrix composites (MMCs, CMCs), New metal-based systems (Superalloys, HEAs, BMGs, etc.), and innovative coating systems as thermal and corrosive barriers
- Self-healing and self-repairing materials
- Liquid-assisted processes (infiltration, brazing, soldering, casting, etc.), Additive Manufacturing, Catalysis, Powder Metallurgy, Assessment of Extraction Processes under non-Terrestrial conditions, etc.
- Space exploration: Thermophysical properties measurements under microgravity, In-situ resource utilization, and ground-based supports

### Symposium Organizer



Dr. Donatella Giuranno  
National Research Council



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