

2021 IEEE INTERNATIONAL WORKSHOP ON

Metrology for AeroSpace

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NAPLES, ITALY

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CALL For PAPERS <<<<



UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II



UNIVERSITÀ
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>>>> for the Special Session on

S2S - SPACE TO SPACE

SCIENTIFIC AND TECHNOLOGICAL CHALLENGES
FOR HUMAN AND ROBOTIC SPACE EXPLORATION

ABSTRACT

Never before in the history of humanity the desire and ambition to explore and conquer the space has been so extraordinary sought. Several real-world plans are currently under examinations in fixing disruptive goals for space exploration to reach just in a couple of decades from now (i.e. realize human and robotic colony on moon and mars).

This urges to afford several challenges issues on both scientific and technological aspects in order to accomplishing with success several missions according to the declared timeline.

Although the progresses of technology in the recent past has made giant steps forward on many fields, human and robotic space exploration needs to be further pushed and assessed on different aspects. The aim of this session is to offer presentation on the state of the art of science and technology and at same time furnishing a discussion forum for the still needed R&D efforts in order to guarantee operative success and long-term reliability of space systems.

On the other side, all the technology related to the space exploration requires significant development of new metrological tools and new modalities for design, measuring and testing.

TOPICS

The topics of the session will include, but will not limited the following:

- Engineering space design, new materials and new construction of infrastructures for human habitation in order to warrant human health for long space missions including: functionalized materials to avoid and/or control microbiological issues in human space modules, inflatable pressurized flexible structures to allow volume growing in space and on planets, additive manufacturing products to utilize in-situ resources, Lunar Communication System...;
- Systems for full robotic space explorations for materials extraction, sampling, probing, visualizing, measuring the space environment, automated system for constructions, refueling, energy generation, ISRU on Moon;
- Vehicle for supporting human exploration including: rovers (both autonomous and human), landers (both autonomous and human), spaceplanes, drones, helicopters, hoppers, Re-entry vehicle (Space Rider), Lunar Shelter, Lunar Habitat;
- Wearable electronic sensors and Lab on Chip technology for continuous health monitoring and biomedical diagnosis (i.e. early detection of biomarkers in body fluids, human behavior biomarkers by computer visions systems, smart textiles, nanosensors,);
- Almost or Fully automated Science MaterialLab and BioLab in permanent infrastructures for supporting both human/robotic exploration sampling and human and vegetal life sustainability;
- Subsystems of space infrastructures (riciclo acque, protezione radiazioni, indoor environmental control, bio regenerative, illumination, crew collaborative robotics, AI solutions, guidance navigation and control including visual autonomous navigation, locomotions, etc);
- Systems for monitoring health (NDT, NDI), for maintenance and repairing (self-repairing) of space infrastructures.

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