

**AIDAA**

Italian Association of Aeronautics and Astronautics  
XXV INTERNATIONAL CONGRESS  
Rome, 9-12 September 2019  
Sapienza University of Rome

**Red Planet Exploration: Research status of Life support Systems and Infrastructures for colonization of Mars**

Human and robotic exploration is foreseen to be one of the next steps in human space colonization, and it is growing the common vision that Moon, on the pathway to Mars, is the outpost to extend human presence in deep space. At the same time, technologies and knowledge derived from space exploration tests, key factors for a more affordable, easier and quicker access to Space, will expand our understanding of the Universe, and create economic opportunities.

This symposium addresses all the aspects of recent advances related to Life support systems and infrastructures and/or analogues for Mars and Moon colonization.

We will dedicate a subsection to Life Support Systems and subsystems (Water Management, Atmosphere Management, Waste Processing, and Food Supply), and another one to Infrastructures and Analogues (present and future).

**Chair:** Eng. Pasquale Cangiano, Eng. Nunzia Favaloro

**Call for Papers:**

Papers are solicited on the technical, scientific, programmatic and educational aspects of Life Support Systems, Infrastructure and Analogue for colonization of Mars.

Those who are interested in presenting a paper shall send an abstract (one-page max) to <mailto:info@aidaa2019.com> no later than April 15, 2019. Prospective participants will be informed, or notified, of the acceptance of their abstracts on or before April 30, 2019. Abstract and Papers must conform to the policy format and style specified in the website.

## **SYMPOSIUM N.8**

# **RED PLANET EXPLORATION: RESEARCH STATUS OF LIFE SUPPORT SYSTEMS AND INFRASTRUCTURES FOR COLONIZATION OF MARS**

**Chaired by Eng. Pasquale Cangiano, Eng. Nunzia Favalaro**  
CIRA - ITALIAN AEROSPACE RESEARCH CENTRE

### **SESSION 1**

**Paper N. 1 FOOD PRODUCTION IN SPACE TO SUSTAIN CREWS DEMANDS DURING THE EXPLORATION OF MARS** - Michele Balsamo, Liyana I. Popova, Wioleta Pawlak, Luca Pieroni, Valfredo Zolesi, Alessandro Donati

**Paper N. 2 EXPLOITATION OF EXTREMETOLERANT CYANOBACTERIA FOR ENABLING HUMAN OUTPOSTS ON MARS** - D. Billi, B. Gallego Fernandez, A. Napoli, C. Mosca, C. Fagliarone

**Paper N.3 A PRELIMINARY MISSION DESIGN OF A PAIR OF SPACECRAFT TO INVESTIGATE THE MARTIAN CLIMATE AND INTERIOR**  
Antonio Genova, Daniele Durante, and Virginia Notaro

**Paper N. 4 INTEGRATION OF HIGHER PLANTS IN BLSS: TECHNOLOGICAL NEEDS FOR FULL USE OF PLANT VERSATILITY AND POTENTIAL IN FUTURE TEST FACILITIES AND SPACE MODULES.**  
Simona Proietti, Stefano Moscatello and Alberto Battistelli

**Paper N. 5 THE MARS TERRAIN SIMULATOR: AN INDOOR ANALOGUE FACILITY FOR VALIDATION AND SIMULATION OF THE EXOMARS ROVER OPERATIONS AND IN SUPPORT TO THE EXOMARS SURFACE MISSION**  
L. Bramante, D. Bussi, M. Deffacis, C. Picco, M. Barrera, P. Franceschetti

**Paper N. 6 MIG, MILITARY INNOVATIVE GREENHOUSES-** G. Pontetti, A. Pontetti, M. Lemme, A. De Santis

**Paper N. 7 THE EDEN ISS FACILITY AS PLATFORM FOR PLANT EXPERIMENTS IN EXTREME ENVIRONMENT** –Raimondo Fortezza, Antonio Ceriello, Domenico De Simone, Daniel Schubert, Paul Zabel, Matthew Bamsey, Conrad Zeidler, Vincent Vrakking

## **SESSION 2**

**Paper N. 8 “HORT EXTREME”. PROTECTED HORTICULTURE IN INFLATABLE FACILITIES, RESISTANT TO EXTREME CONDITIONS, FOR THE PRODUCTION OF HIGH NUTRITIONAL VALUE PLANTS: A FIELD EXPERIMENT IN THE AMADEE-18 MISSION.**

Luca Nardi, Sara Piccirillo, Giulio Metelli, Giuseppe Corallo, Elisabetta Bennici, Marco Potenza, Francesco Cavaliere, Gabriele Mascetti, Eugenio Benvenuto

**Paper N.9 MICROBIAL BEHAVIOUR, FOOD SAFETY AND SPACE. THE EDEN-ISS PROJECT**

Filomena Nazzaro, Simona Proietti, Stefano Moscatello, Florinda Fratianni, Raffaele Coppola, Paul Zabel, Daniel Schubert, Peter Downey, Michelle Bennett, and Alberto Battistelli

**Paper N. 10 PLANT BIOLOGY AND CROP PRODUCTION IN EXTRA-TERRESTRIAL ENVIRONMENTS: CHALLENGES AND OPPORTUNITIES**

Stefania De Pascale, Carmen Arena, Giovanna Aronne, Veronica De Micco, Antonio Pannico, Roberta Paradiso, Youssef Roupael

**Paper N. 11 MYOGRAVITY - MULTIDISCIPLINARY APPROACH TO THE ANALYSIS OF THE FUNCTIONAL ALTERATIONS INDUCED BY MICROGRAVITY IN HUMAN SATELLITE CELLS, AND STUDY OF POSSIBLE COUNTER MEASURES**

E.S.Di Filippo, S.Chiappalupi, S.Falone, F.Amicarelli, G.Sorci, S.Fulle

**Paper N. 12 INTEGRATED SIMULATIONS OF MARS FLIGHTS ON THE ISS**

L. Narici, G. Reitz, C. Lobascio