



INTERNATIONAL ACADEMY OF ASTRONAUTICS



11th IAA Symposium on the Future of Space Exploration: Moon, Mars and Beyond: Becoming and Interplanetary Civilization

Torino, Italy
Politecnico di Torino, Lingotto Campus
Via Nizza 230

June 17-19, 2019

PRELIMINARY PROGRAM

June 17, 2019

The sessions of June 17 will be held at the ALTEC facility, Corso Marche 79. Transportation between the Politecnico and ALTEC will be provided. Buses will leave the Lingotto Campus of Politecnico (Via Nizza 230) at 8.00

8.30-10.00
9.00

Registration (at ALTEC)

Welcome to the participants

V. Giorgio, ALTEC CEO
R. Angelini, Thales Alenia Space
G. Saracco, Rector of Politecnico di Torino
J.-M. Contant, IAA Secretary General
G. Genta, Politecnico di Torino, Local Organizing committee

Session 1.

Chairperson: Sabrina Corpino

9.30

Towards the Moon Village Implementation

G. Reibaldi, Moon Village Association and IAA

9.50

Possible synergies between Moon and Mars Exploration

G. Genta, Oleg Ventskovsky, Les Johnson, Politecnico di Torino, Yuzhnoye Design Office, NASA Marshall Space Flight Center

10.10

Deep space exploration in China: Moon, Mars and beyond

Gongling Sun, International Space University

10.30

LOP-G in Support to Lunar Exploration

F. Fenoglio, Thales Alenia Space

10.50

Coffee break

11.20

Round Table: Towards the Moon Village

Moderator: J.-M. Contant, IAA Secretary General

G. Martucci, ALTEC

D. Schmitt, ESA

C. Lobascio, Thales Alenia Space

Gongling Sun, International Space University

ASI

TBD

G. Reibaldi, Moon Village Association, President, IAA

12.20

Lunch

13.45

Visit to Thales Alenia Space and ALTEC facilities

15.00

Return to Politecnico di Torino, Lingotto Campus (by bus)

- Session2 Chairperson: Nicole Viola
- 15.30 **Considerations About Future Missions**
C. Bruno, University of Connecticut
- 15.50 **The Economics of Space Mining**
A. Sommariva, Leonella Gori, Barbara Chizzolini, Mattia Pianorsi, , Università Bocconi
- 16.10 **International Cooperation as a Key Driver for Emerging Space Nations**
C. Iacomino, M. Sacchetti, Università Bocconi
- 16.30 **Moon Farside Spectrum Protection by Negotiations**
C. Maccone, IAA
- 16.50 **Coffee break**
- 17.30 **Concert by the choir of Politecnico di Torino**

June 18, 2019

- Session 3: Chairperson: Giuseppe Reibaldi
- 9.00 **Unnoticeable Space Resources - Lunar Sports**
A.G. Faddoul, Tony Sky Designs Group
- 9.20 **Minimum number of settlers for survival on another planet**
J.M. Salotti, University of Bordeaux
- 9.40 **Extended Space Journeys: Current to G-Zero and G-1 Human Aspects in Crewing and Phasing**
A.G. Faddoul, Tony Sky Designs Group
- 10.00 **Human-in-the-loop Related Space Missions: Application of Probabilistic Modeling**
E. Suhr, J.M. Salotti, Portland State University, University of Bordeaux
- 10.20 **Coffee break**
- Session 4: Chairperson: Giancarlo Genta
- 11.00 **Electric sail phasing maneuvers with radial thrust**
M. Bassetto, L. Boni, G. Mengali, A.A. Quarta, University of Pisa
- 11.20 **Static structural analysis of an electric sail with Finite Element approach**
L. Boni, M. Bassetto, G. Mengali, A.A. Quarta, University of Pisa
- 11.40 **Trajectory and Preliminary Design Integrated Tool for a Reusable Lunar Space Tug**
J. Rimani, C.A. Paissoni, N. Viola, G. Saccoccia, J.G. del Amo, Politecnico di Torino, ASI, ESTEC
- 12.00 **Design of Halo Orbit in the Framework of Elliptic Restricted Three Body Problem using Differential Evolution**
N. Rithwik, R. V. Ramanan, Indian Institute of Space Science and Technology
- 12.20 **Lunch**
- Session 5: Chairperson: Gongling Sun
- 14.00 **On Possibilities for Development of the Common-Sense Concept of Habitats Beyond the Earth: Part 1**
V. Volkov, A. V. Degtyarev, L. M. Lobanov, A. P. Kushnar'ov, Ie. Yu. Baranov, V. S. Volkov, A. O. Perepichay, V. V. Korotenko, O. A. Volkova, G. G. Osinovyy, Yu. A. Lysenk1, M. D. Kaliapin, Yuzhnoye State Design Office, E.O. Paton Electric Welding Institute, National Technical University of Ukraine
- 14.20 **On Possibilities for Development of the Common-Sense Concept of Habitats Beyond the Earth: Part 2**
V. Volkov, A. V. Degtyarev, L. M. Lobanov, A. P. Kushnar'ov, Ie. Yu. Baranov, V. S. Volkov, A. O. Perepichay, V. V. Korotenko, O. A. Volkova, G. G. Osinovyy, Yu. A. Lysenk1, M. D. Kaliapin, Yuzhnoye State Design Office, E.O. Paton Electric Welding Institute, National Technical University of Ukraine
- 14.40 **Multi-CubeSats Constellation Design for Lunar Global Communication and Positioning Systems**
Bojin Hu, Dong Qiao, Xiangyu Li, Yu Cheng, Beijing Institute of Technology, Ministry of Ind. and Inf. Tech.
- 15.00 **Analysis on Artificial Intelligence Applications for Celestial Body Exploration and Operations**
D. Carabellese, G. Thirion, I. Adamson, M. Karnal, M. Giuliani, Politecnico di Torino, ISAE Supaero, Leicester University
- 15.20 **Coffee break**

- Session 6 Chairperson: Andrea Sommariva
- 16.00 **Effects of attitude constraints on solar sail optimal interplanetary trajectories**
A. Caruso, A.A. Quarta, G. Mengali, University of Pisa
- 16.20 **Electric sail active control law for artificial Lagrangian point maintenance**
L. Niccolai, A. A. Quarta, G. Mengali, University of Pisa
- 16.40 **Modelling of Pneumatic Sample Transport Systems for Enceladus Surface Acquisition**
D. Riccobono, , S. Moreland, P. Backes, G. Genta, Politecnico di Torino, Jet Propulsion Laboratory
- 17.00 **Road Map to the Stars: Current, Anticipated, and Required Technology Milestones**
A.G. Faddoul, Tony Sky Designs Group
- 19.30 **Official Dinner**

June 19, 2019

- Session 7: Chairperson: Giovanni Mengali
- 9.00 **Profound Human Metabolic Downregulation For Space-Stress Tolerance: (Preliminary) Experimental Proof-Of-Concept**
S. Murat, Jungle Innovations
- 9.20 **Be cool to be far: exploiting hibernation for space exploration**
M. Cerri, University of Bologna
- 9.40 **Sustainable Design for Extended Space Travel, Technology Apprised**
A.G. Faddoul, Tony Sky Designs Group
- 10.00 **Biosignatures are Based on Their Information Content (EVO-SETI Scale)**
C. Maccone, IAA.
- 10.20 **From spirituality to preservation. Is there a chance of peaceful exploration of the Moon?**
R. Rapetti, M. Hanlon, MVA
- 10.40 **Coffee break**
- 11.00 **Round Table on Future problems in Human Space Exploration**
Moderator: Giancarlo Genta
Andrea Sommariva, , Università Bocconi
Remo Rapetti, MVA
Giancarlo Genta, Politecnico di Torino
Matteo Cerri, University of Bologna
Stefano Catucci, University of Rome
- 12.00 **Synthesis of the Symposium**
G. Reibaldi, , President Moon Village Association, IAA
- 12.30 **Closing**
- 12.40 **Lunch**

