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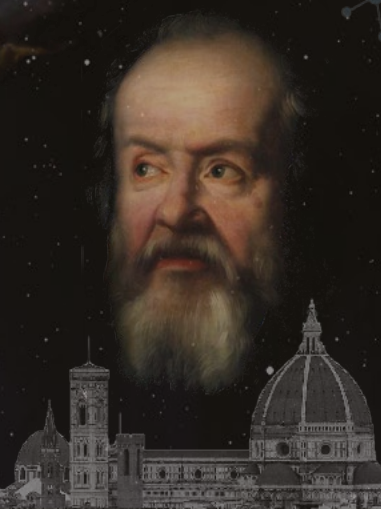


Building a Space Faring Civilization

Advancing the Renaissance of Science,
Medicine, and Human Performance
in Civilian Spaceflight

SALA DELLA SCHERMA,
Fortezza da Basso, Florence
12-16 Sep. 2023

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INTRODUCTORY REMARKS

Marianne J. Legato, M.D., Ph.D.

We conceptualize humanity's ever more successful effort to explore space as no less than a Third Renaissance in which men and women are engaged in an ever-expanding and ever more successful effort to implement human existence on other planets beside our own. With increasing intensity and frequency, our most accomplished pundits warn that our continued existence on earth faces an uncertain future. Climate change, the possibility of nuclear warfare, collision with other celestial elements like asteroids, the invasion of infecting agents for which we have no defense, and ultimately the collapse of the sun itself are all possible scenarios that make it imperative and indeed, a moral responsibility, to explore alternative worlds on which we survive. Clearly, we are addressing these warnings: we have achieved enough progress in engineering and in our understanding of how best to address human physiology for some to predict that we will have permanent human settlements on Mars by 2036. This seminar is an unique assembly of world class scholars who will examine the current information on what we have achieved and equally important, what unsolved challenges we face -as well as the unanticipated issues we will inevitably meet in the future. Not only are we addressing the twin threats of space (radiation and microgravity) to men and women's survival, but we are also considering the complex issues of the governance of harvesting and distribution of resources of these new worlds by nations and governments with vastly different cultures and objectives. We are also considering the moral principles involved in the preservation of the integrity of the environment of the planets on which we choose to visit, explore and on which ultimately to establish permanent civilizations. The solutions to the questions we are framing do not all have clearly defined answers: will we have to alter human physiology by innovative new methodology to ensure adaptation to entirely new environments? How will we regulate various nations' successes and competition in harvesting the resources of new worlds? And what moral principles must we fashion to ensure the integrity of the planets we eventually visit and from which we extract elements of value? All of these issues, and more, form the basis of our deliberations.

PRESIDENT

Marianne Legato

The Foundation for Gender-Specific Medicine
New York (USA)

STEERING COMMITTEE

Jeff A. Jones

MD, Baylor College of Medicine
Veterans Affairs Medical Center,
Houston (USA)

Marianne Legato

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SCIENTIFIC SECRETARIAT

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www.hinovia.com

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PROGRAMME

TUESDAY, 12th SEPTEMBER 2023 - AFTERNOON

01.00 p.m. - 06.00 p.m. Faculty Board

WEDNESDAY, 13rd SEPTEMBER 2023 - MORNING

SESSION I

08.45 a.m. - 09.30 a.m. Icarus Revisited: Exploring the New Frontier of Space. 21st Century Achievements. 22nd- Century Goals and Challenges

M. Legato (New York, USA)

09.30 a.m. - 10.15 a.m. Exploring the Attributes of a Space Faring Civilization

M.A. Schmidt (Boulder, USA)

10.15 a.m. - 11.00 a.m. *Coffee break*

11.00 a.m. - 11.45 a.m. Galileo's Sidereus Nuncius: Reconfiguring Space in Early Modern Europe

N. Wilding (Atlanta, USA)

11.45 a.m. - 12.30 a.m. Terrestrial Space and Celestial Space in Renaissance Art

C. Acidini (Florence, IT)

12.30 a.m. - 01.15 p.m. *Lunch Break*

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PROGRAMME

WEDNESDAY, 13RD SEPTEMBER

WEDNESDAY, 13RD SEPTEMBER 2023 - AFTERNOON

SESSION II

- 01.15 p.m. - 02.00 p.m. Four Futures of Human Spaceflight
B. Sherwood (Kent, USA)
- 02.00 p.m. - 02.45 p.m. Space: And the Third Great Age of Discovery
S. Pyne (Tempe, USA)
- 02.45 p.m. - 03.30 p.m. The Human Experience of Conducting Engineering and Construction Operations in Space
R. Vittori (IT)
- 03.30 p.m. - 04.15 p.m. Preparing for the Unpredictable: Facilitating Multi-System Resilience in Human Spaceflight
M. Shelhamer (Baltimore, USA)
- 04.15 p.m. - 05.00 p.m. *Discussion*

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THURSDAY, 14TH SEPTEMBER

THURSDAY, 14TH SEPTEMBER 2023 - MORNING

SESSION III

- 08.45 a.m. - 09.30 a.m. Exploring the Earth, Skies, and Space with a view towards applicability for future civilian spaceflight operations
D. Holland (Roanoke, USA)
- 09.30 a.m. - 09.45 a.m. *Coffee break*
- 09.45 a.m. - 10.30 a.m. Risk and Systems Medicine in Human Space Exploration
E. Antonsen (Houston, USA)
- 10.30 a.m. - 11.15 a.m. Multi-Omic Profiles of SpaceX and Axiom Astronauts and the Cornell Aerospace Biobank
C. Mason (New York , USA)
- 11.15 a.m. - 12.00 p.m. Precision Medicine Part II: Using Functionally Characterized Networks to Optimize Health and Performance in Space
M.A. Schmidt (Boulder, USA)
- 12.00 p.m. - 12.45 p.m. *Lunch Break*

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THURSDAY, 14TH SEPTEMBER

THURSDAY, 14TH SEPTEMBER 2023 - AFTERNOON

SESSION IV

- 12.45 p.m. - 01.30 p.m. The Frontier of Photonics Biosensors: towards the Cultural Welfare in the Space Missions
F. S. Pavone (Florence, IT)
- 01.30 p.m. - 02.15 p.m. Medical Incidents during Human Spaceflight Missions and the Potential impact on Commercial Spaceflight Participants
J. A. Jones (Houston, USA)
- 02.15 p.m. - 03.00 p.m. Precision Medicine Part I: Practical Application of Pharmacogenomics and the Nuances of Drug Prescribing in Space
M.A. Schmidt (Boulder, USA)
- 03.00 p.m. - 03.45 p.m. *Discussion*

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FRIDAY, 15TH SEPTEMBER

FRIDAY, 15TH SEPTEMBER 2023 - MORNING

SESSION V

- 08.45 a.m. - 09.30 a.m. Training Civilian Astronauts for Living and Working in Space
J. Kavandi (Sparks, USA)
- 09.30 a.m. - 09.45 a.m. *Coffee break*
- 09.45 a.m. - 10.30 a.m. Building an Astronaut Digital Twin: Practical Applications for Advancing Human Spaceflight
C. M. Schmidt (Boulder, USA)
- 10.30 a.m. - 11.15 a.m. Utilizing Precision Medicine Screening, Countermeasures, and Treatments for Low Earth Orbit and Beyond
S. Johnston (Houston, USA)
- 11.15 a.m. - 12.00 p.m. The Critical Imperatives of Behavioral Resiliency in Civilian Space Travelers
B. Beard (Mountain View, CAN)
- 12.00 p.m. - 12.45 p.m. *Discussion*
- 12.45 p.m. - 01.30 p.m. *Lunch Break*

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PROGRAMME

FRIDAY, 15th SEPTEMBER 2023 - AFTERNOON

SESSION VI

- 01.30 p.m. - 02.15 p.m. Concentrated lunar resources: imminent implications for governance and justice
M. Elvis (Cambridge, USA)
- 02.15 p.m. - 03.00 p.m. What is the Frontier of Mining Space Resources and How Do We Prepare Human Explorers and Workers for those Operations?
D. Durda (Boulder, USA)
- 03.00 p.m. - 03.45 p.m. Social Global Challenges Around the Idea of Space Settlement
K. Szocik (Rzeszow, PL)
- 03.45 p.m. - 04.30 p.m. Frontiers In Biotechnology for a Spacefaring Civilization
C. D. Walker (Tucson, USA)
- 04.30 p.m. - 05.15 p.m. What the First Commercial Space Station Means for Humanity?
M. L. Dittmar (Houston, USA)
- 05.15 p.m. - 05.30 p.m. *Discussion and Closing Remarks*

SATURDAY, 16th SEPTEMBER 2023 - MORNING

- 09.00 a.m. - 01.00 p.m. Closing Remarks

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FACULTY

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Mary Lynne Dittmar	Axiom Space Headquarters, Houston (USA)
Dan Durda	Department of Space Studies Southwest Research Institute, Boulder (USA)
Martin Elvis	Harvard University, Cambridge (USA)
Dwight Holland	Principal of the Human Systems Integration Associates, Roanoke (USA)
Smith Johnston	Retired NASA JSC Medical Officer and Retired CMO Axiom Space Houston (USA)
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GENERAL INFORMATION

MEETING VENUE

The venue for the meeting will be:

SALA DELLA SCHERMA, FORTEZZA DA BASSO, V.le F. Strozzi, 1 50129 Firenze

SECRETARIAT DURING THE MEETING

The Secretariat will be open at the following times:

Wednesday, 13rd September: 08:45 a.m. - 05:00 p.m.

Thursday, 14th September: 08:45 a.m. - 05:00 p.m.

Friday, 15th September: 08:45 a.m. - 05:30 p.m.

OFFICIAL LANGUAGE

The official language of the Meeting will be English.

TECHNICAL FACILITIES

Facilities will be available for computer presentations and overhead projections.

A business center with PC (Powerpoint for Windows) will be available for check and preview of presentations. It is essential that speakers take their presentation to the business center at least one hour before the session starts.

The center will be open at the following times:

Wednesday, 13rd March: 08:45 a.m. - 05:00 p.m.

Thursday, 14th March: 08:45 a.m. - 05:00 p.m.

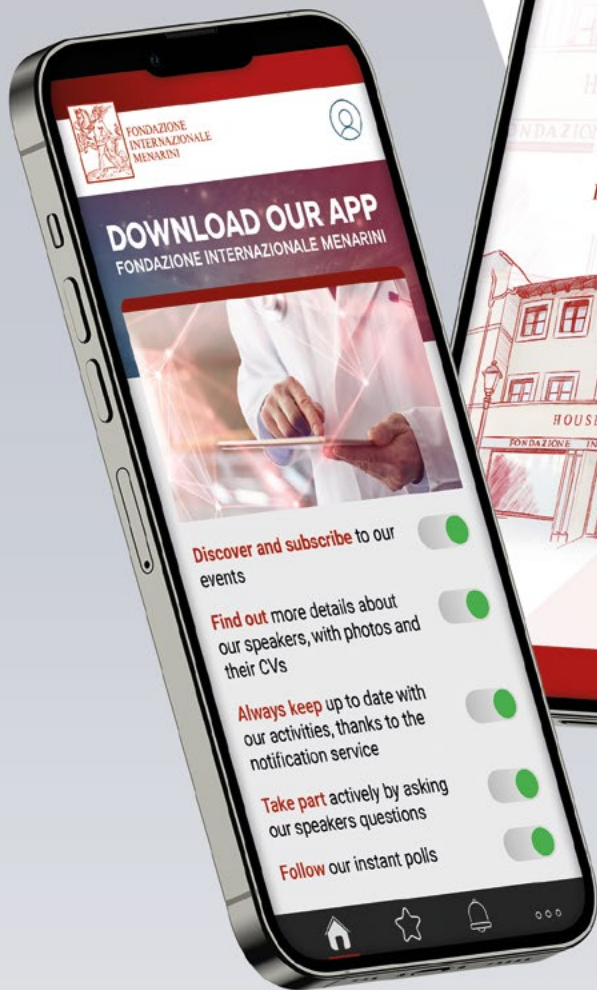
Friday, 15th March: 08:45 a.m. - 05:30 p.m.

LUNCHESS AND COFFEE BREAKS

Lunches and coffee breaks will be served in the Meeting area.

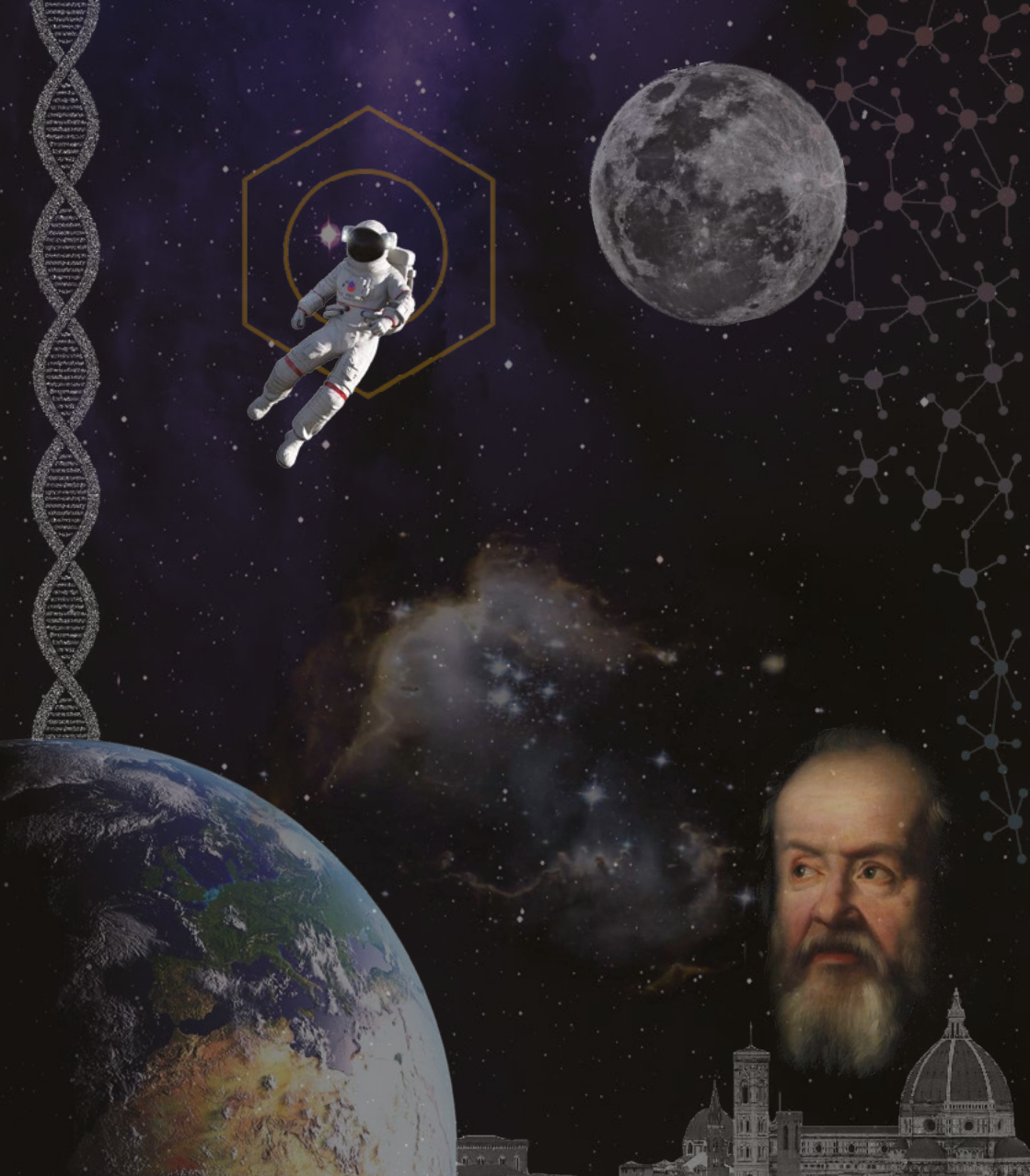


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