The new SpaceLand Center in Mauritius: benefits for African and Asian Countries

Incubating the Future, in Microgravity

Carlo VIBERTI
U.N.-U.A.E. High Level Forum, Dubai 6 Nov 2017
Kids, elderly, people with disabilities:

anyone can be actively engaged in educational & techno-scientific innovation in microgravity.
Record-breaking crew members selected among the general public, trained and brought to fly by SpaceLand team led by former ESA-zero-gravity test engineer and Space Station MIR European Technology Experiment Coordinator Dr. Carlo Viliberti for biomedicine technology and/or bioengineering experiments commissioned by Nobel Prize winner led groups, taking off from the NASA Space Shuttle L.T. (Kennedy Space Center, Cape Canaveral, Florida)

World’s youngest kid as research test subject in zero-gravity: 11 yrs old

11-year-old Kim Marco Viliberti flew in 2008 as test subject for neurobiological sampling experiments related to studies of neurophysiology such as the Alzheimer’s syndrome, commissioned to SpaceLand by the European Brain Research Institute led by Dr. Rita Lavi

World’s oldest man in zero-gravity: 93 yrs old

93 year old man flying as test subject for bioengineering experiments commissioned by the US National Science Foundation’s Bioengineering Center of Milan (Image from CNN TV news report)

World’s 1st disabled for technology tests in zero-g

100% disabled woman as test operator for hand-free ICT control system commissioned by IRB Moderne (“Informatic tools for disabled and elderly”)

First non-US citizen: taking off from NASA Space Shuttle L.T.

SpaceLand Flight Mission Commander Eng. Dr. Olof Viliberti is the 1st non-U.S. citizen authorized to take off for microgravity research flights from the NASA Kennedy Space Centre. He has been formally appointed by the head of the Italian Space Agency to fill an 8th Astronaut-Engineer on the first sub-orbital research flight campaign.

This program has been supported with grants features in Oxford at the 1st UK Space Agency’s workshop on microgravity and the 1st Space Commerce Summit in 2013 in London with NASA

Footage showing Kim operating at the speedland technology payload test, broadcasted by the Italian State TV “RAI” and United States news reports.

SpaceLand / Carlo Viliberti have been awarded, inter alia, the following prizes:

- European “GOM” Award for Innovation Policy, by the European Commission
- Italy “Torino di Controso” – Gold Medal by the President of the Republic of Italy
- Italy “Tribù des Imprese” – Italy’s Entrepreneurship and Associations Association
- Italian Aeronautics and Astronautics Association Award
- Canadian Space Agency Certificate of Recognition
Collaborations also with the German Space Agency, Airbus and other 16 European research entities of the Robex team, the Romanian National Institute for Metals and Radioactive Resources ICPMRR, the Polytechnic Universities of Torino (I) and Odessa (Ukr), several ESA Clean Space industries, etc.

SpaceLand’s micro-g ECG on 93-yr-old subject

93-year-old test subject ECG during SpaceLand research flight April28, 2007 in Mars-G, Moon-G, 0-g jointly with Polo Tecnologico Fondaz. Don Gnocchi Milano Italy

Bio-garment zero-G qualified by SpaceLand and utilized since 2015 by the astronauts on the International Space Station
NGF, BDNF and Cortisol Levels during Parabolic Flight

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(2) Institute of Neuroendocrinology and Molecular Medicine, CNR, European Brain Research Institute (EBRI), Rome

EXPERIMENTAL PROCEDURE

Saliva samples were self-collected by the experimental subjects (nine adults and a 11 years old boy) during a 17 minute parabolic flight (GARBELLI, Bresciana, Italy) before, during and after the parabolic flight. Saliva was collected by chewing on a cotton roll for 2-3 min and returned to transport tube. Samples were stored frozen at -20°C until assay.

Saliva was assayed for nerve growth factor (NGF), brain-derived neurotrophic factor (BDNF) and cortisol (CORt) levels.

CONCLUSION

In agreement with previous studies on parachutists and on astronauts experiencing stress related to skydiving and space mission, experimental subjects showed an increase in salivary levels of NGF and BDNF only during specific phases of the flight. Moreover, individual as well as age related differences have been observed. These data confirm the role of NGF and BDNF in the adaptive response to "extreme situations" involving psychological stress.

An unprecedented Center of Excellence for Microgravity

**Weightless Laboratories**

- Out-of-this-world opportunities, including emulated and actual Lunar-G, Mars-G, Zero-Gravity, and Airbus-supported or NASA-related aircrafts

**Public-access Space Facilities**

**Intelligent Hospitality & Tourism**

- Astronaut Training Experiences, also underwater and in drop towers, for entertainment to families, tourists and for International Corporate Incentives and Events (MICE)
Implementing the first Center of Excellence for Microgravity

Deal 1 implementation inside the chosen land

- Construction and start of operations (within the next 2 years)
- Adaptation Study to Mon Tresor and detailed design (within the next year)
- Preliminary design of 22 facilities (completed, 0.75 M EUR invested)

System requirements analysis and architectural concepts

Business plan sized for 165,000 visitors/year, facilities dimensioned for up to 400,000/year
Research, Education & Training open to anybody

Democratizing the access to innovation in microgravity:
addressing planetary exploration and Moon-G / Mars-G educational technological, biomed and scientific R&D programs, creating jobs, spin-off’s and fall-back apps to everyday’s life, including edutainment and space tourism facilities.
Every $ invested in space centers brings up to 7 $ into local economy.

besides.....
SpaceLand is **not** a standard space center, hardly accessible by the people, *rather, it is an* **international Hub for Microgravity R&D**

generating a new «Space Economy»

and preparing **any African and Asian**

for a **new future**, leading to the **Moon and Mars**...