

The challenges:



40 years after the first human steps on the moon a possible future lunar settlement and industrialization still depend very much on cheap and safe access to space.



The space elevator as a means for inexpensive and safe travel from Earth to space that only recently has been considered viable may foster a permanent outpost on the moon and industrial activities on it: Oxygen production from lunar soil will be among the first processes. Mining of lunar regolith for precious Helium-3 to be used in future ecological fusion reactors may follow soon after. NASA is addressing these challenges with two competitions: lunar regolith excavation and lunar oxygen production or MoonROx.

The conference:

will join some of the world's leading researchers and engineers on space elevator systems and carbon nanotube fiber production. An add-on this year will be a session on lunar industrialisation challenges. In line with the scope of EuroSpaceward's mission, ESA's Aurora and NASA's Constellation program, this new part of the conference will examine the research status of both NASA's Lunar Regolith Excavation and MoonROx Challenge as well as latest activities concerning the Google Lunar X Prize.

The conference is organized by the European Spaceward Association in cooperation with the National Research Fund of Luxembourg, the US Spaceward Foundation, the Japan Space Elevator Association, the Liège Space Centre, the University of Liège and the Université Catholique de Louvain.



Dec 5: Space Elevator System

Morning session

- Keynote: He3 mining on the moon
- Inflatable space tower versus tether
- The SpaceShaft Project

Afternoon session

- Results of NASA power beaming challenge
- Japan space elevator competition
- Top climber performance analysis
- Artistic project on space elevator climber design

Dec 6: CNT Tether – Lunar Industrialization

Morning session

- Status of CNT fiber growth and strength
- Flaw tolerant design of space elevator tether
- Results of NASA's strong tether contest

Afternoon session

- Regolith excavation challenge
- Lunar oxygen production challenge
- Latest on the Google Lunar X Prize

Top speakers:



Prof. Dr. Gerald Kulcinski, University of Wisconsin-Madison, USA, is Director of the Fusion Technology Institute at the University of Wisconsin. Prof. Kulcinski's research involves developing fusion reactors as future sources of clean, safe and economical energy. Research into the mining of He3 on the moon is another area of his interest.



Suichi Ohno, Japan, is founder and chairman of the Japan Space Elevator Association. Mr. Ohno will be presenting the results of the 1st Japan Space Elevator Technology and Engineering Competition held in August 2009.



Prof. Dr. Nicola Pugno, Polytechnic Institute Turin, Italy, is a leading researcher on structural mechanics of carbon nanotubes. He has been working with Nobel Laureate Prof. Kroto and has investigated the role of defects in the design of a space elevator cable. He got the *Leading Scientist of the World* Award



Prof. Dr. Vesselin Shanov, University of Cincinnati, USA, leading authority on Carbon Nanotube growth. Together with Mark Schulz he established the Smart Materials Lab, where his team has grown record length carbon nanotube arrays. He has won several prestigious awards for research and teaching in USA.



Dr. Juan Vilatela, Cambridge University, UK, will be presenting the latest research results on the development of super strong carbon nanotube fibers. He is a research leader working in the team of Prof. Windle at the Department of Materials Science of Cambridge University.



Prof. Dr. Dean Vucinic, Vrije Universiteit Brussels, Belgium, is Senior Research Scientist at the Department of Mechanical Engineering. Together with Nelson Semino, USA, and Dr. Patrick Vankeirsbilck, Belgium, he is developing inflatable bricks for a space elevator shaft.