Blue Dot – Shaping the Future

The German View of Alexander Gerst's ISS Mission

Freya Scheffler-Kayser, DLR RD-RM

Alexander Gerst

- Born 3. May 1976 in Künzelsau, Germany
- PhD in Geophysics; specialist for volcanism

- May 2009 - selected as astronaut candidate together with fifth others out of more the 8000 applicants

- Sept 2011 - Nominated for ISS-Expedition 40 and 41 (May to November 2014)

- Mid 2011 - Start of mission preparation by a common concept group ESA/DLR

www.**planet**3.de *(private Website of A. Gerst)*

The Mission of Alexander Gerst

- Launch: 28. May 2014
- Landing: 10. November 2014
- Mission Duration: 166 days

- First time direct return to Cologne DLR's "envihab" for his medicals
- First flight for a German since 2008
- Alexander is the 11th German in space

- 100 experiments in total of all ISS partners; 39 ESA experiments in eight domains
- Extra Vehicular Activity (EVA)
- Public relations

Public Relation

5. June: Press conference with German Media (more than 15)

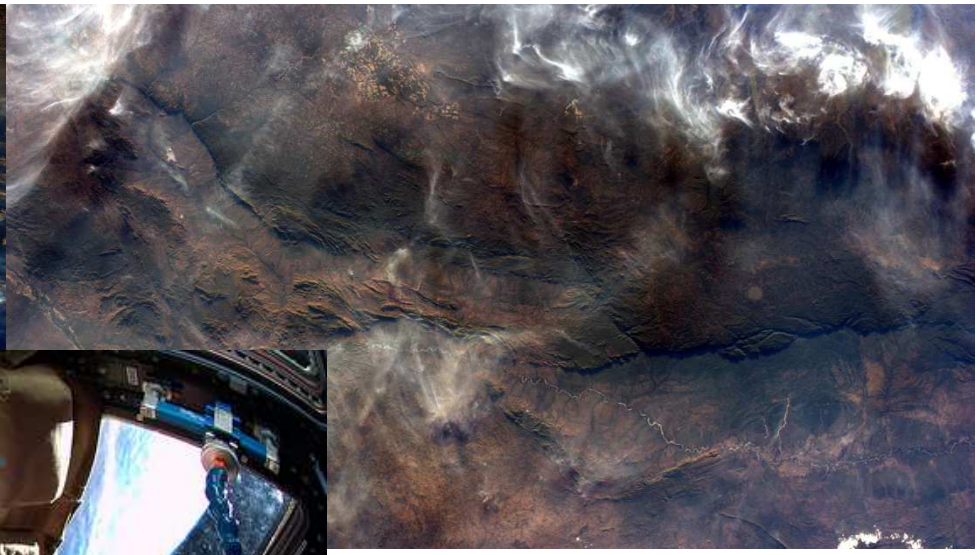
The Crew in FIFA World Cup Fever

4. September: Live Call with Künzelsau more than 5000 people

unicef Ambassador for children

Social Networks

Salt sea in Bolivia



Fires in East Africa

Germany

Polar lights - aurora

http://blogs.esa.int/alexander-gerst/

DLR

Amazon Rainforest

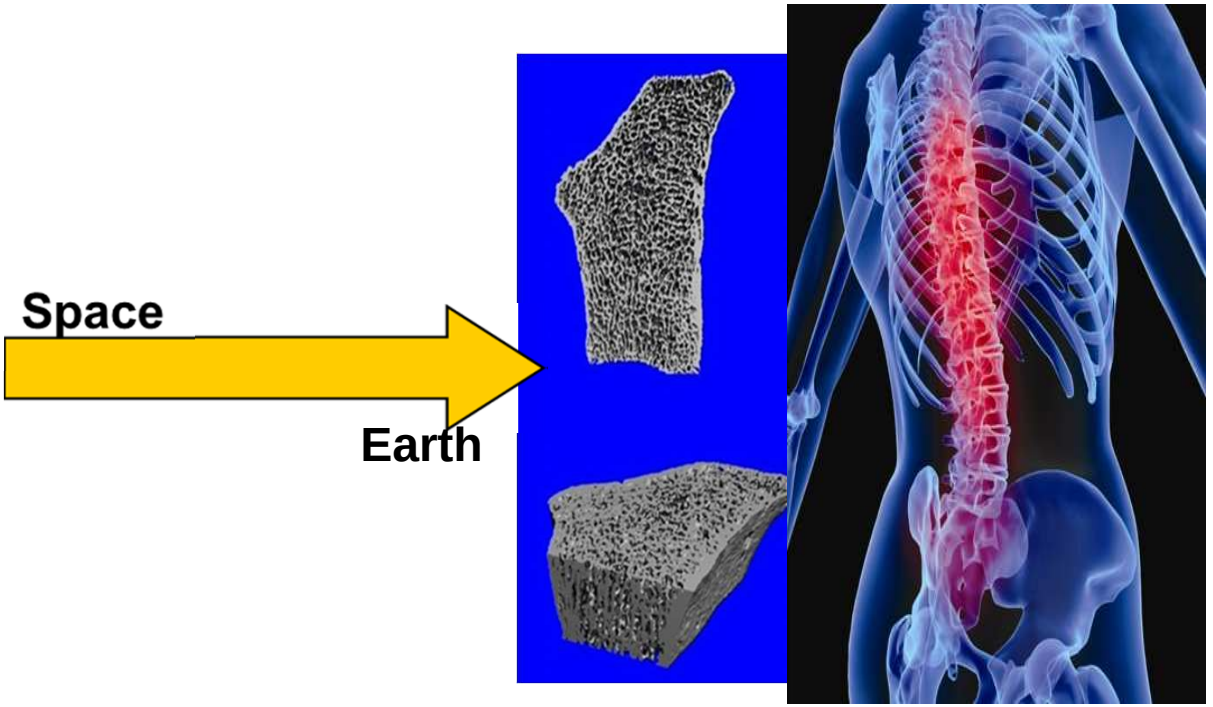
Soon gone?

The Amazon rainforest is the lung of our planet. Can we afford to live without him?

Human Physiology Research

focused on human health and performance

- Astronauts in microgravity experience the same aging effects as elderly on Earth but in an accelerated time flow.
- Skin-B
- Circadian Rhythms
- Cartilage (ground)

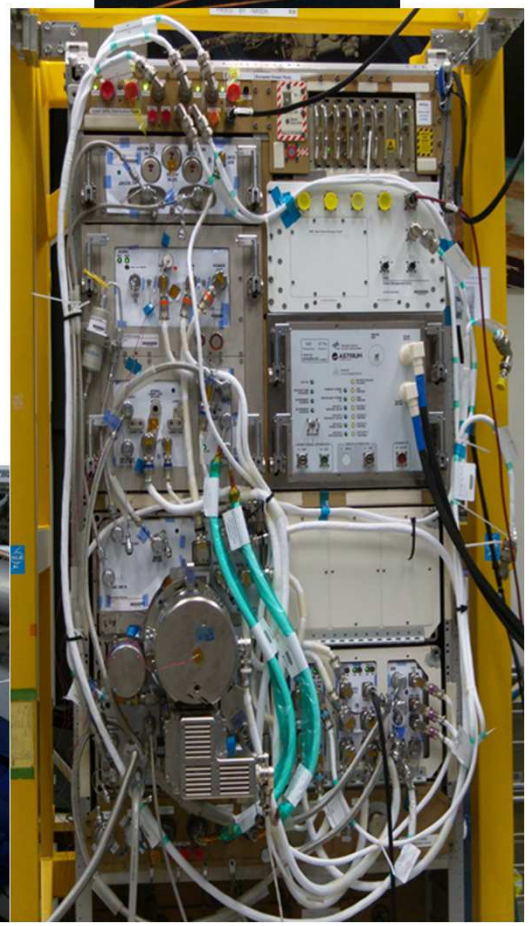


- Aging Research: Osteoporosis, Arthroses, immunity, immobilization
- *Osteoporosis cost in EU: 37 Billion €/year*

DLR

Material Science:
Electro Magnetic Levitator EML

- First ISS furnace that permits melting metal alloys in microgravity without a container.
- Samples measuring 6 to 8 mm in diameter float freely only suspended by an small electromagnetic field.
- Fundamental Science and processing of alloys.
- EML measures the temperature dependent properties as viscosity, surface tension, specific heat,…

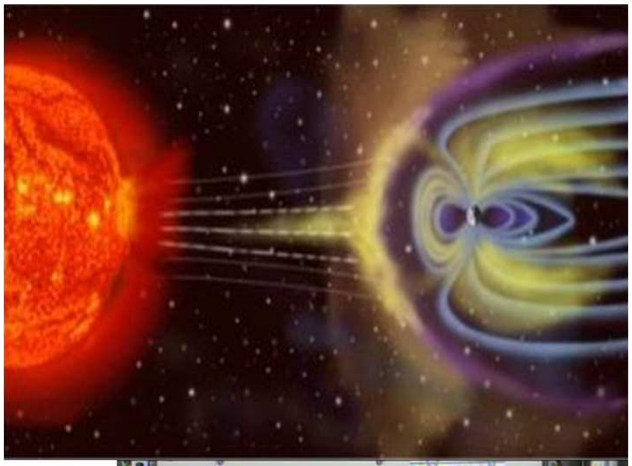


Space

Earth

- Pave the way for new materials by giving better parameters of optimizing the production process for metal materials.

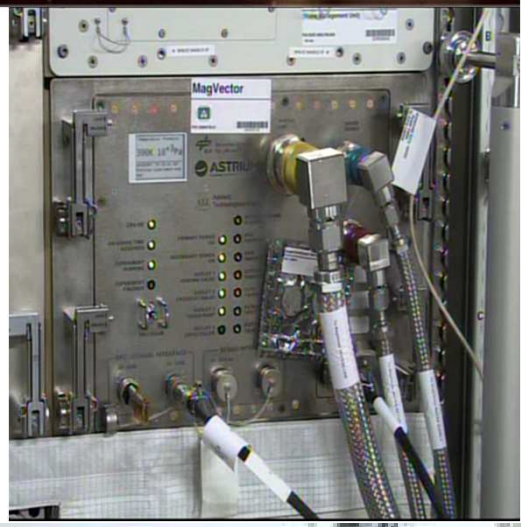
Technology:
MagVector (Magnetic Field Experiment)



- Interaction of a good conductor travelling with ISS velocity (28000 km/h) within Earth magnetic field was investigated.
- Expected data should show the magnetic field effects of the ram and wake side of the conductor.
- A. Gerst installed and activated the experiment.
- The latest data look very promising.
- Fast Track Project (15 months from development to delivery readiness – low cost).

Space

Earth



- Astrophysics: Better understanding of the interstellar interaction of solar particle with planets with and without a magnetic field.
- New space technologies (science fiction: magnetic protection shield)
- Energy Research, Electro mobility

Funded by BMWi

EVA: 6.5 h challenging work together with Reid Wiseman

Education: Columbus Eye

ISS Live-pictures in School

- 4 HD-Video cameras of NASA are permanently filming the Earth.
- Videos can be seen in Web in real time (since April 2014)
- A geographers team of the University of Bonn has created lessons material.
- Lessons subjects: Geography, Physics and Biology
- For pupils of the classes 5 to 13.
- Possible Themes:
  - **Volcanisms**
  - **Thunder- and Lightning**
  - **Oceans**
  - **Polar lights**
  - **Country: Germany**
- High light: Amateur Radio Event to ISS for the test school
- www.columbuseye.uni-bonn.de
- http://www.ustream.tv/channel/iss-hdev-payload

Education: Flying Classroom

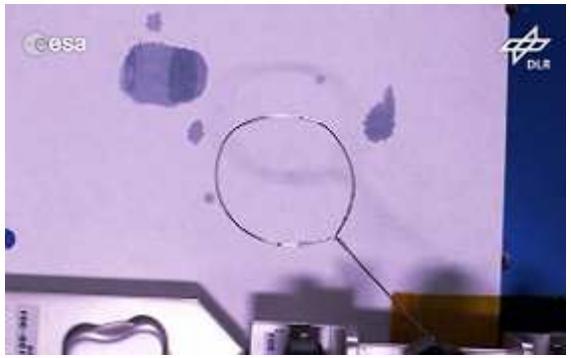
- In so called small pocket experiments Alexander demonstrated phenomena by using simple parts already available on board.
- http://www.dlr.de/next/

Helicopter, Paper planes

Hand Gyroscope/Gyro twister

Rosetta- Philae Docking Demo

Foaming of Water



Marangoni Convection

Particle Agglomeration

Silly Putty+ spinning Pen

by Samantha

Education: Top Experiment „Aktion 42“

- Competition for pupils by DLR together with „Stiftung Jugend Forscht“ (Foundation Youth Researches)and ESA
- Pupils could propose experiments with parts out of a lists of 42 items of daily life already on board
- Alexander will do the experiment on the Space Station
- Post mission the winner team will meet Alexander
- Selected: Soap bubbles in microgravity
  lifetime, behavior by adding water; influence of sound
- http://www.dlr.de/next/


We have to take care of our planet Earth.
It is the only spaceship we have.
Thank you for your attention