



Spaceship Earth

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Tuesday, September 06, 2011

Spaceship Earth: a wonderful place in the Universe



Three major themes:

- Life
 - Biodiversity
 - Climate

Three major events:

- Letter to delegations
- Lessons online
- In-flight calls



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Primary collision

The start of every cosmic ray 'event' is a single charged particle that passes close to the nucleus of a gas atom in the atmosphere. To a large extent it doesn't matter what the particle is, what is important is the energy that the particle carries.

A cosmic ray **proton** has struck and broken up a nitrogen nucleus. The some of the kinetic energy of the proton has been used to create a series of new particles, most commonly **pions** and **kaons**. You can use the links on the right to find out about these particles.

Nitrogen nucleus



Proton: p



What are protons and neutrons?

Neutron: n



Positive pion: π^+



What are pions?

Neutral pion: π^0



Negative pion: π^-



Positive kaon: K^+



What are kaons?

Neutral kaon: K^0



Negative kaon: K^-



Repeat

Continue

Spaceship Earth lessons: Life



Life support on ISS:

- Advanced recycling systems

Human body:

- Effects of living in Space on astronauts

Human life on Earth:

- The planet and its resources
- Human settlements from space



Spaceship Earth Lessons: Biodiversity



Biodiversity:

- Geography of life on Earth



Ecosystems:

- Sustainability

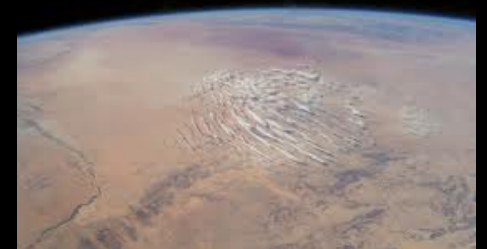


Extreme environments:

- Exobiology



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Microclimates:

- On earth and on the ISS

Weather and climate:

- Meteorology and atmospheric sciences

Large climate phenomena:

- Wrath of Nature
- Space weather



Spaceship Earth Live events: Mission X: Train like an Astronaut



Physical exercise



Nutrition



Teamwork



Mental agility



Spaceship Earth Live events: In-flight call – Mission X



16 participating countries

>4000 children globally

8-12 year old



Live in-flight call kick-off:

- 4 European sites
- >1200 children



Spaceship Earth Live events: Understanding microgravity



EPO-Convection

Illustration on a small scale of
the large convection patterns on
Earth



EPO-FOAM-S

How gravity influences foam
formation and stability can help us
make cutting-edge materials

Spaceship Earth Live events: In-flight call – EPO experiments



Distribution of education kits to European schools



International participation:

- 4 sites
- > 1200 children
- age 10-14



MagISStra mission event 2010



Thank you for your attention!

**André's pictures from space
and educational material:**

www.esa.int