



High Level Panel
Space as an Arena for Innovation, Integration and Investment

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Grand Hyatt Dubai, Dubai UAE

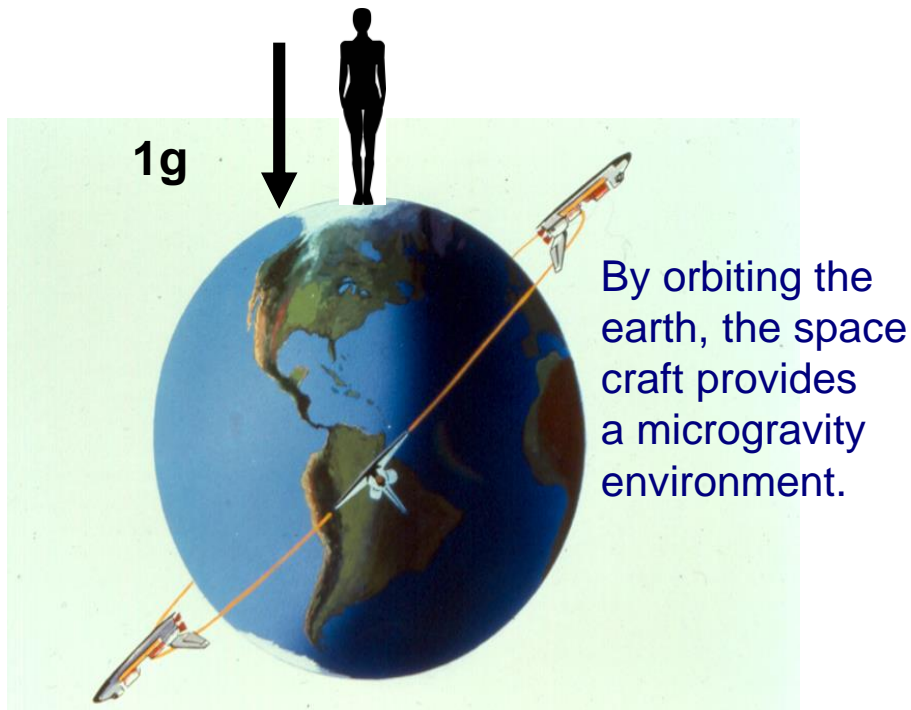
Towards the Next Stage of Exploration
Space2030 as an opportunity
for innovation, integration and investment

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ISS: a unique facility

---Gravity now becomes the new variable---



With the help of a centrifuge, variable g-levels can be created

If you wish to examine the role gravity plays, you need an environment free from gravity

Medical Science

Aging Research : Rodent Research

- ◆ Compare mice condition under micro-g and 1G
- ◆ Investigate the effect of gravity environment and gene expression patterns in space
- ◆ Aging research in space helps us understand mechanisms of aging-like phenomena and develop methods of prevention.

Launch

micro-g
6 mice

artificial 1G
6 mice

Research

Return mice to ground alive

Change in Bone

1G μG

Outer: cortical bone
Inner: cancellous bone

Parameter	1G	μG
Bone Volume BV/TV (%)	~14	~4
Trabecular number Tb.N (1/mm)	~1.7	~0.7
Bone mineral content BMC/TV (mg/mm ³)	~90	~30

Change in Muscle

1G μG

Decreased 10%

Average value ± standard error 6 mice/group

Condition	Relative Muscle Mass (%)
1G	100
μG	~90

Concept of Using Satellite Technology as a Medical Tool

----- Health Care on Public-level -----

Environmental information helps health care on public-level

Space Medicine

Health Care on Individual-Level

- for Astronauts
- for people on earth

Satellite Technology

1. Communication
2. Earth observation
 1. Monitor
 2. Assessment
 3. Prediction, Prevention

Benefits from space for public health

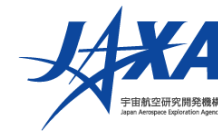
Health Care on Public-level

- Dedication of space technology
 - ◆ Earth observation
 - ◆ Human health
 - ◆ Education

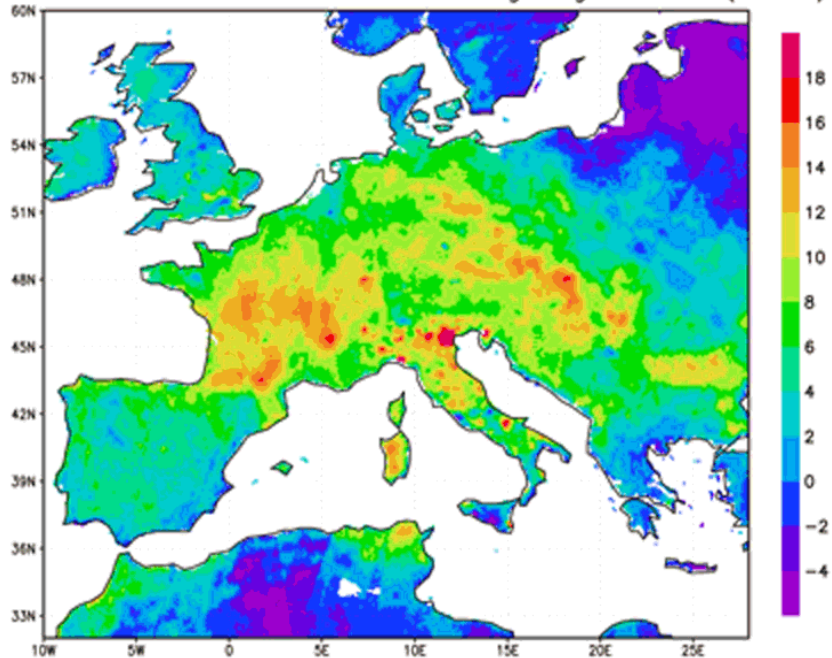




Heat Wave in Europe, Aug. 2003



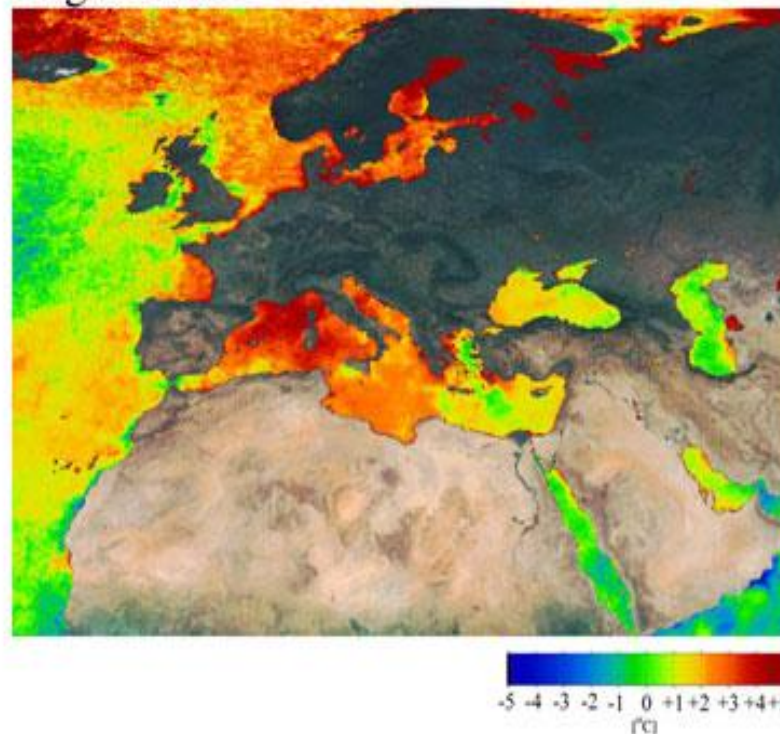
AMSR-E 10V 2003 minus 2002 during Aug.10-15 (Kelvin)



DAOS: COLA/GES

2003-08-18-

August 2003



Left: [Atmospheric temperature deviation](#) in Aug. 2003 from 2002 derived from AMSR-E. Some spots are supposed to be false patterns due to radio interference.

Right: [Sea surface temperature deviation](#) in Aug. 2003 from 2002 derived from MODIS.

**Deaths from Europe's 2003 heat waves (heatstroke and excess mortality):
22,146 in Europe(14,802 in France and 3,134 in Italy)**

Sources: WHO, 2004 report

Quoted Heat waves fact at a glance: www.ifrc.org/publicat/wdr2004/chapter2.asp

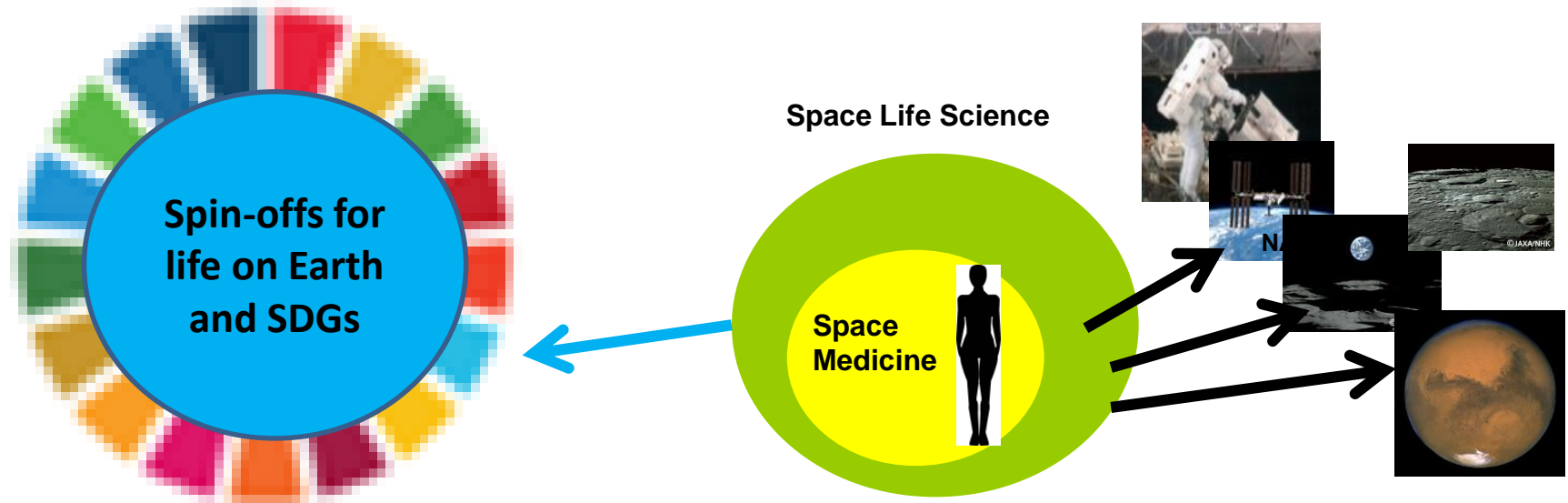


Space medicine will contribute to creating a better society

Aerospace medicine (www.asma.org)

Aerospace medicine concerns the determination and maintenance of the health, safety, and performance of persons involved in air and space travel.

Space medicine and space life science enable human space exploration



Spin-offs from space

Exploration

Towards the Next Stage of Exploration

- **Continue exploration**
 - Deep space to reach far from earth
 - Earth as a part of space
- **Take a more interdisciplinary approach**
 - Robotic and human exploration together
 - Satellite data with earth in-situ data
- **Dedicate to the life innovation and green innovation**
 - Disaster monitoring with Astronauts/Cosmonauts and the satellites
 - Climate change and its effect on our life on earth
 - Global Health Security/Public Health
 - Space Solar Power System (SSPS)
- **Promote commercialization**
 - Shift paradigm from governments to companies
 - Promote healthy competition among companies for high achievements
 - Space tourism
- **Seek tangible and non-tangible benefits**
 - Material spinoffs
 - Global awareness of earth as a home planet
 - Education

Acceptance of Diversity

Strengthen global alliances
by learning from the differences
and cherish the similarities amongst us

UNOOSA to be a Nest for Accommodating Diversity

