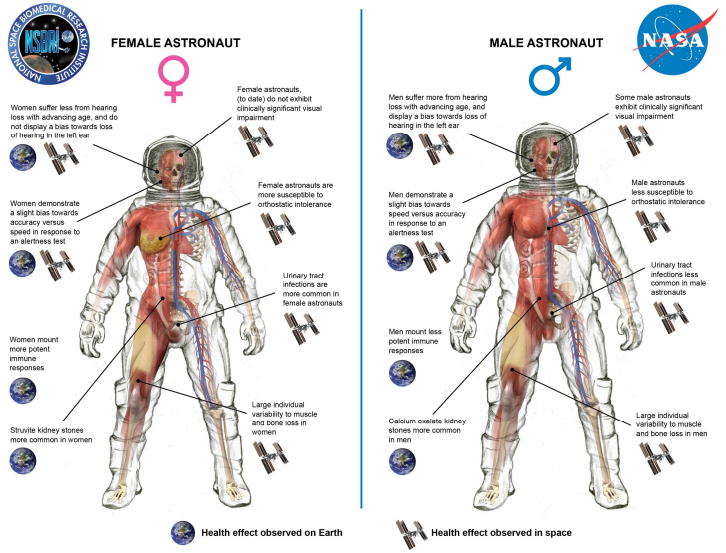
How does space already help?

- Satellite data, GNSS, telecoms
- Used against disasters but also in prevention
- TelAny (Telemedicine Anywhere project)
- Medical research applied on pathologies on the Earth
- Space technology used for better diagnosis and treatment

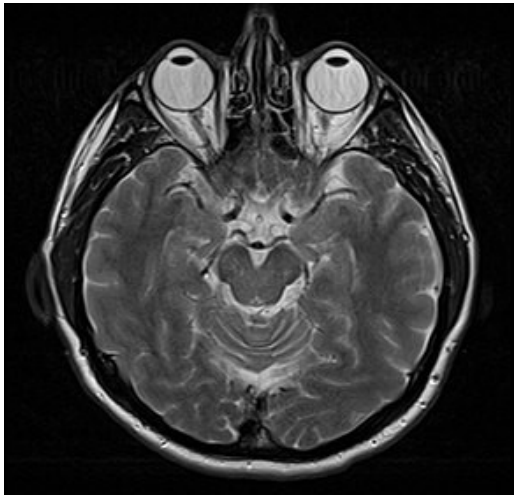


Source: NASA

Source: Temple University

Spin-off technologies

- Thermoelastic polymer developed by NASA used in pacemakers
- Orthopaedic implants decontaminated with gas that corrodes spacecraft
- CCD cameras now used in biopsies
- Advanced robotics for surgery
- MRI image processing, molecular modelling, etc.



Source: Wikipedia

Source: NASA
(https://www.nasa.gov/pdf/363454main_medical_flyer.pdf)

Space mission analogues with biomedical studies

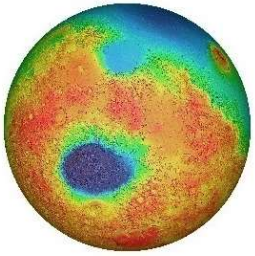
- Bed rest studies (ESA / MEDES, DLR, Slovenia)
- Mars500 (Roscosmos, CNSA, ESA)
- MDRS, FMARS (The Mars Society)
- CAVES, CAVES-X, PANGAEA (ESA)
- Hi-SEAS (NASA, Cornell, University of Hawaii)
- NEEMO (NASA, FIU)
- Neutral Buoyancy Lab (Most agencies)
- ISS (NASA, Roscosmos, ESA, JAXA, CSA)
- Submarines
- Antarctic Stations - Concordia (IPEV, PNRA, ESA)

Source: NASA

Human science applications

- Space is a pre-pathological condition (study diabetes etc.)
- Bone degeneration in space > osteoporosis
- Muscle degeneration in space > neurodegenerative diseases
- Bacterial-resistant material for spacecraft > to be used in hospitals



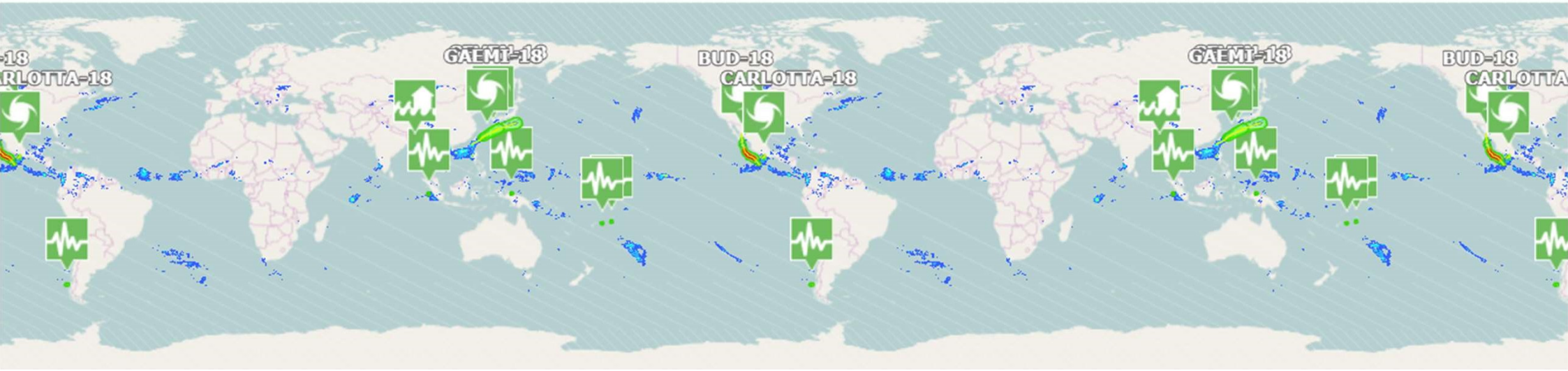


Key Questions

1) A global alert system with coordinated responses can help to reduce the impact of disasters and disease outbreaks.

What components should such a global alert system to combat health risks consist of?

Source: GDACS



Key Questions

2) How can the "last mile problem" be overcome to create sustainable risk awareness?

Source: Alliance Industrial

Source: Al Jazeera

Last mile problem: the problem to establish the challenging link between persons in risk and relevant information to combat the risk.

Key Questions

3) How can medical research implemented in space or in analogues be more efficiently used for healthcare on the planet?

And how can related technology be better utilised (spin-offs)?

Source: ESA

Source: NASA

Splitting into groups

- Rotating system to tackle all problems
- Diversified teams (do not always work with the same partners)
- 3 people should act as “anchors” for the 3 topics; they will not rotate
- Who wants to be an “anchor” for…
  - Components of global alert system?
  - Overcoming the last mile problem?
  - Application of space medical research and technology?

WG: 7 Space for Global Health		
Participants	Nationality	Background
Rochelle Velho	UK	Science/Medicine
Anthony Yuen	Australia	Engineering/Medicine
Laszlo Bacsardi	Hungary	Engineering
Luís Ferreira	Portugal	Engineering
Camilo Reyes	Colombia	Engineering
Juan Carlos Mariscal Gómez	Mexico	Engineering
Christoph Beischl	Germany	International Relationships
Tania Robles	Mexico	Engineering