

Fighter pilot and astronauts training

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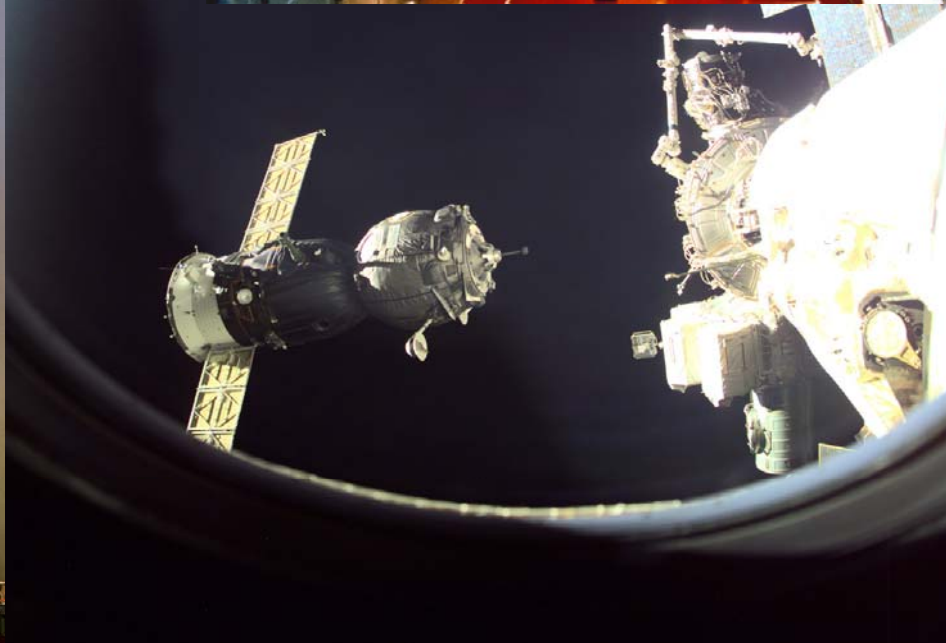
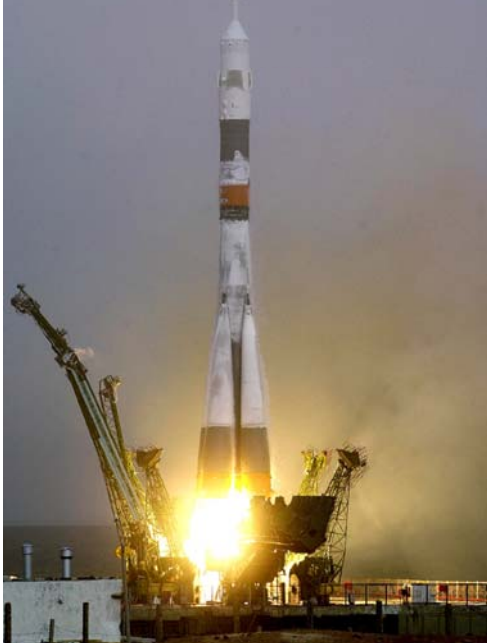
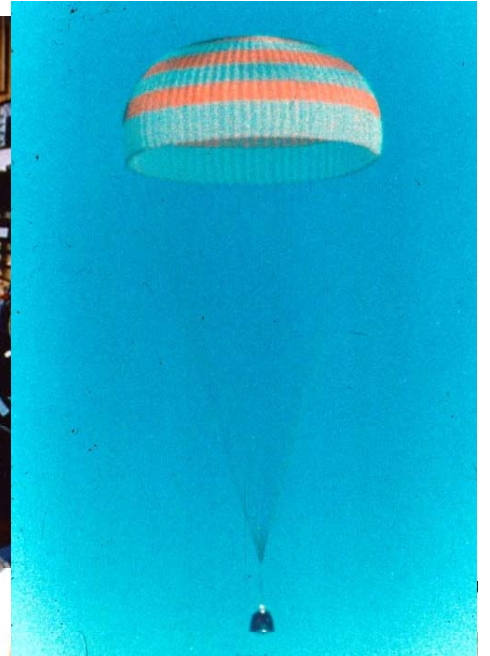
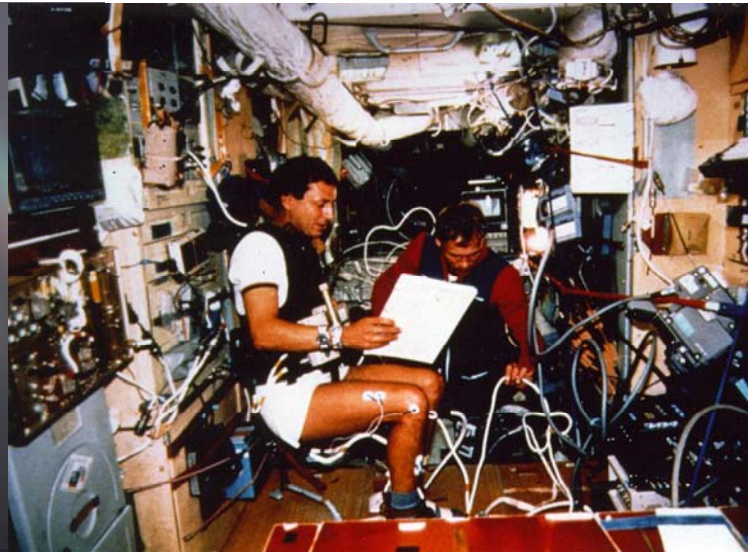
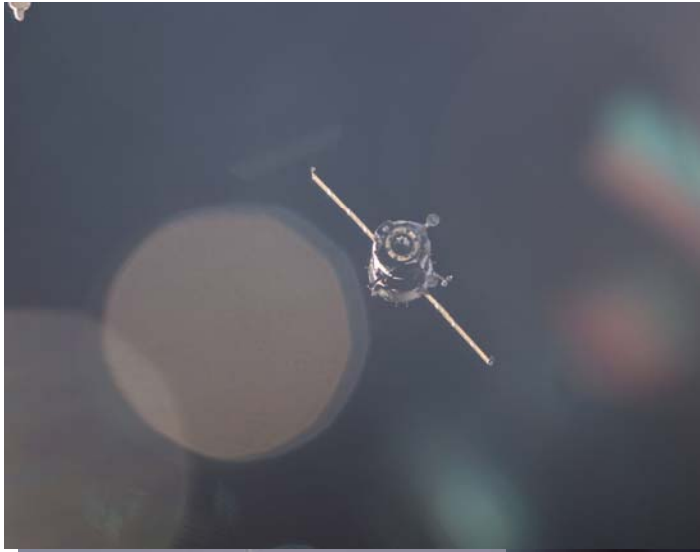
Comparison between training of fighter pilots and astronauts



My background

- Air force academy
- Fighter pilot
- Test pilot
- Astronaut

1st space mission Soyuz + MIR 1992 ANTARES



2 nd space mission space shuttle Columbia 1999 Chandra



- Fighter pilots are military, officers and are at minimum college graduates.
- Fighter pilots and test pilots were chosen for astronauts for the 1st generation (1960s)
 - For quick reaction
 - Experience in flying in difficult and complex situation
 - Stress management

Astronaut corps have an average of:

- 1/3 fighter-test pilots,
- 1/3 engineers,
- 1/3 scientists.

Selection process; only elite is accepted:
6 astronauts selected at ESA in 2008
for 8400 candidates.



EUROPEAN ASTRONAUT CORPS



European Space Agency

Requirements

- First requirement: a candidate must meet physical, psychological and intellectual requirements for admission to training.
- The selection is really demanding for fighter pilots.
- It is even harder for astronauts
- Size requirement for pilots and astronauts
- Then there are regular medical checks during the career

- Physical training is a major part of the program for both pilots and astronauts.

- Fighter pilots like astronauts are very motivated, but there is a need to be a little aggressive for fighter pilots, not for astronauts.
- Both have to be team players.
- This is why the psychological selection is important.

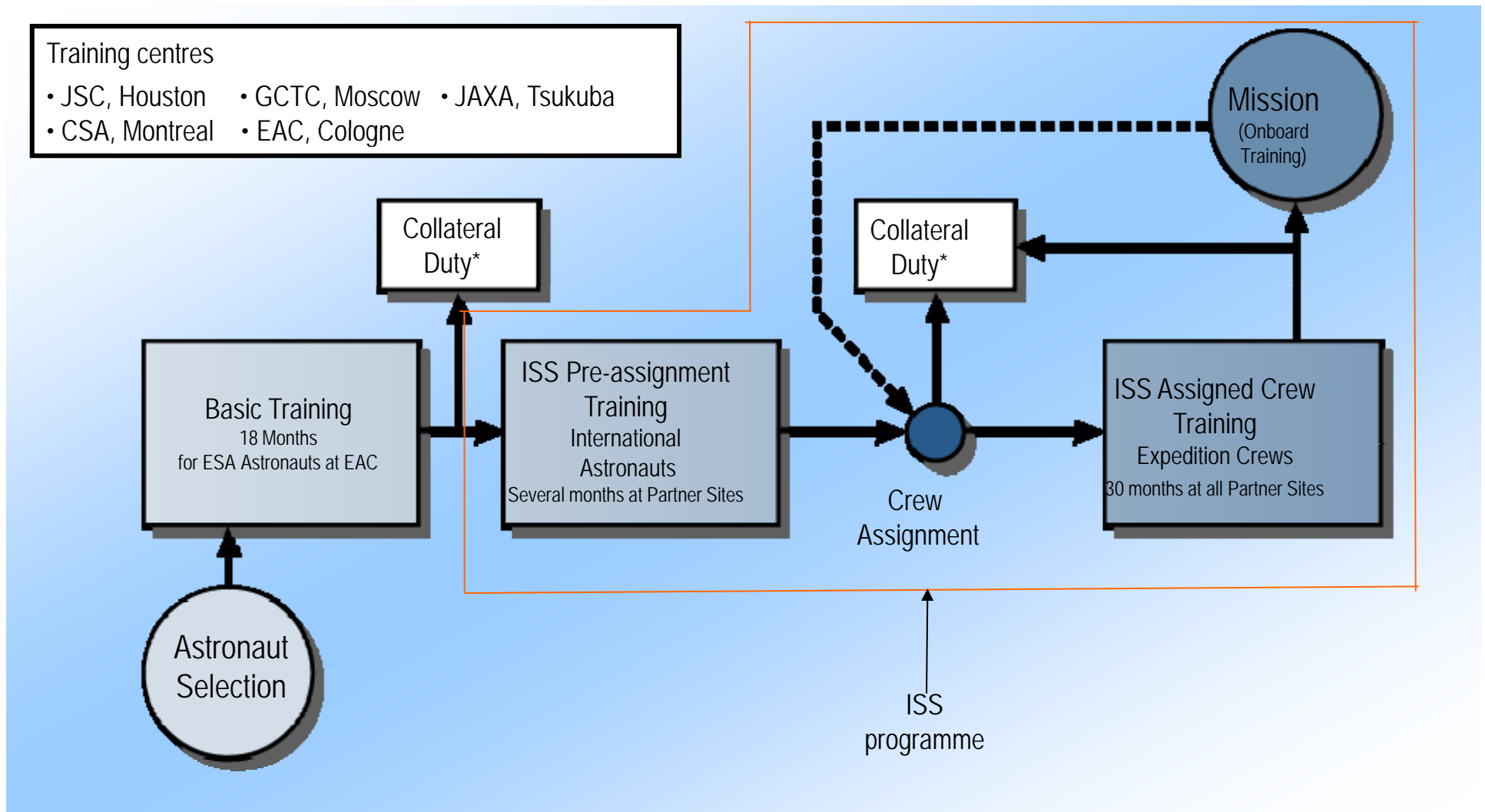
Flight school

- Flight school is a combination of academics, dealing with more serious aviation related subjects such as meteorology, aeronautic theory, principles of flight, etc., as well as flying, both in simulators on the ground and in planes in the air.
- Start with small aircrafts and we increase gradually speed and complexity
- System training is gradually increasing as equipment becomes more and more sophisticated

Astronaut training

- Astronaut training is slightly different as there is not any way to simulate completely accurately a space mission and that there is not any way to fly progressively to Space!

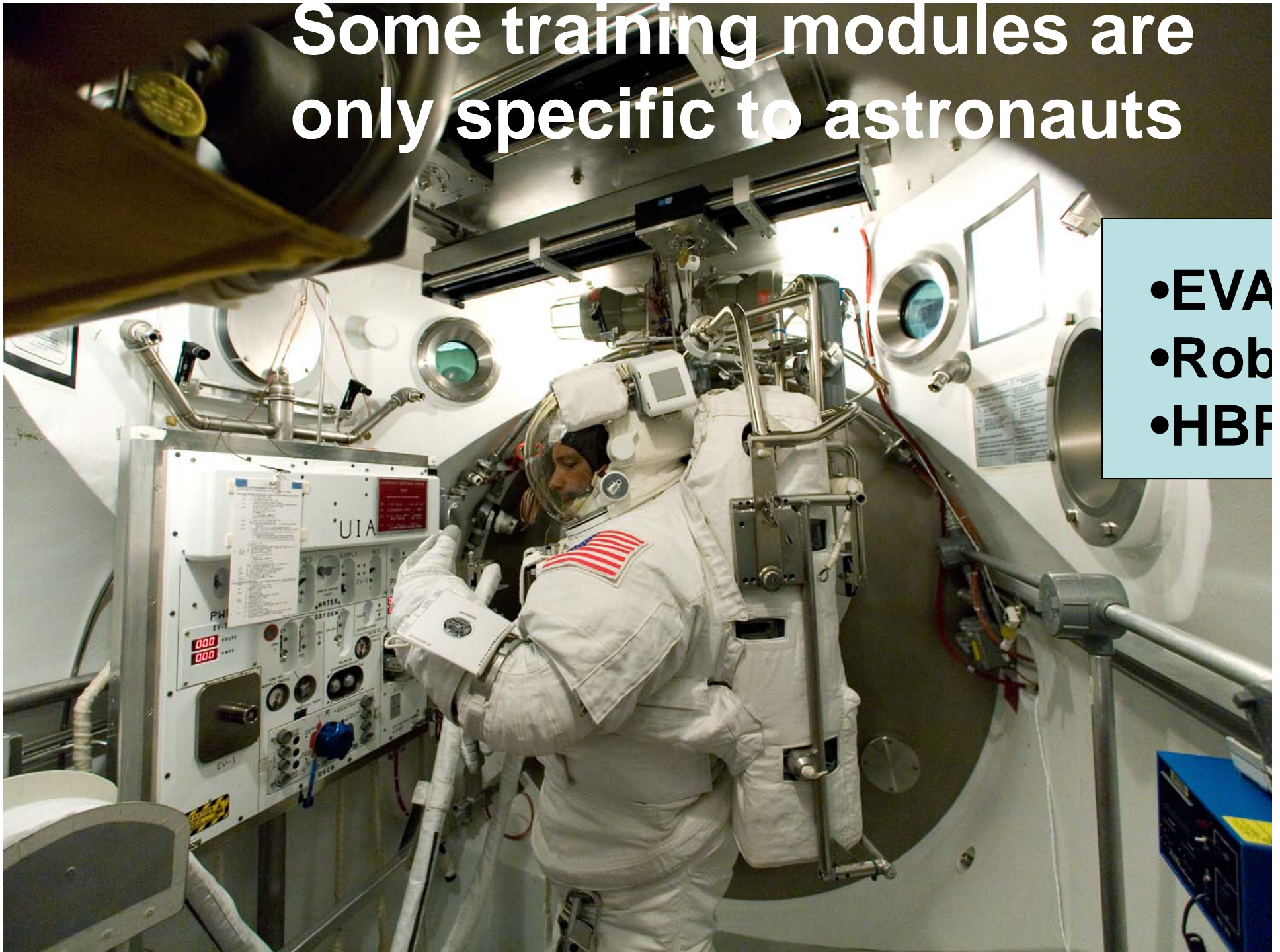
TRAINING ISS: training is very long for astronauts, and at different locations



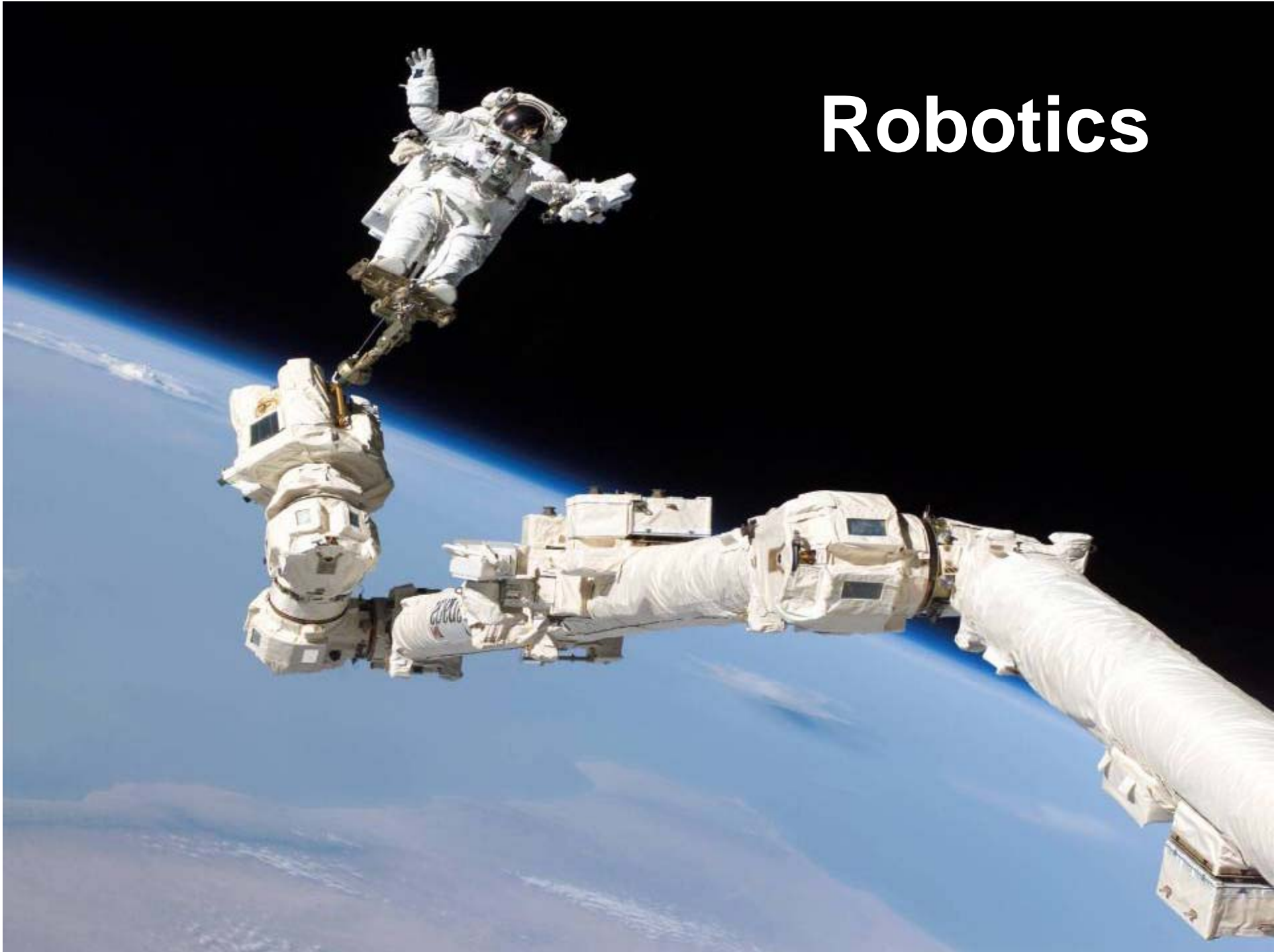
* Collateral Duty, Proficiency Maintenance (e.g. Flying, Fitness) continuously

Some training modules are only specific to astronauts

- EVA
- Rob
- HBF

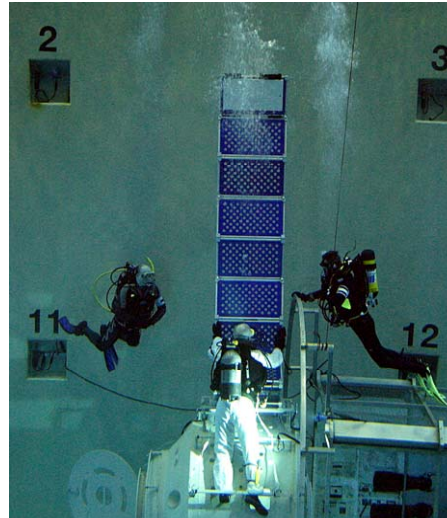


Robotics



ESA Training center

- Neutral Buoyancy Facility (NBF): Training pool for EVA



• Scientific Modules

- EPM: physiology
- Biolab
- EDR
- FSL: fluids

- Stress is also a big part of flight school as we want people who can not only deal coolly with the stress of in flight emergencies, but the also with the added stress of flying under combat conditions.
- Stress is an important part of training for astronauts.
- Team work, leadership, and followership.
- HPB and CRM

Stress management

- Astro Selection based on psychology:
 - General info (texts to write)
 - Psycho-technical Tests
 - individuals psychological Tests
 - group psychological Tests
 - Training to increase the psychological résistance (outdoor and CAVE)

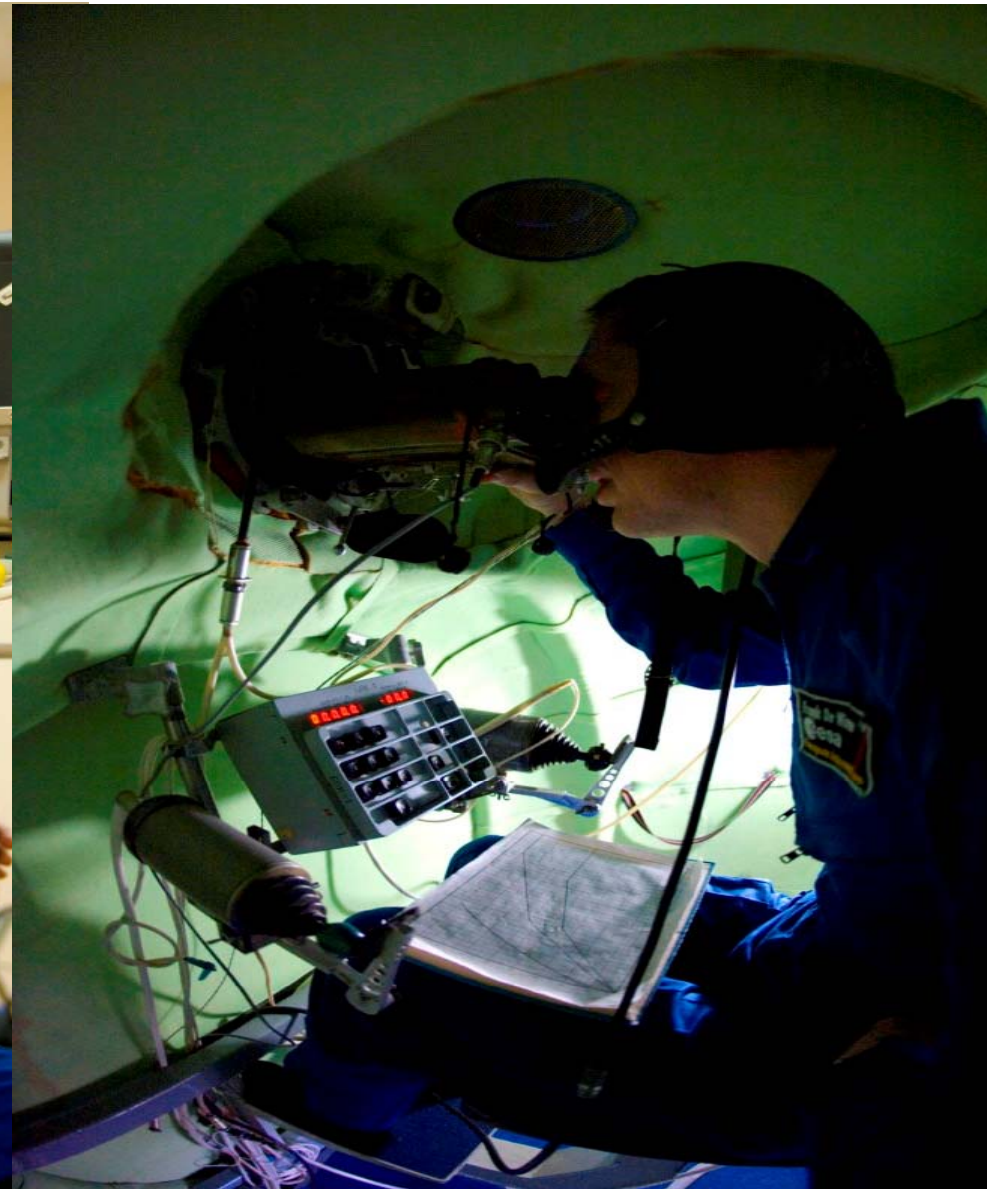
ESA HBP Cave



ESA HBP CAVES



Russia/Gagarin Cosmonaut Training Centre



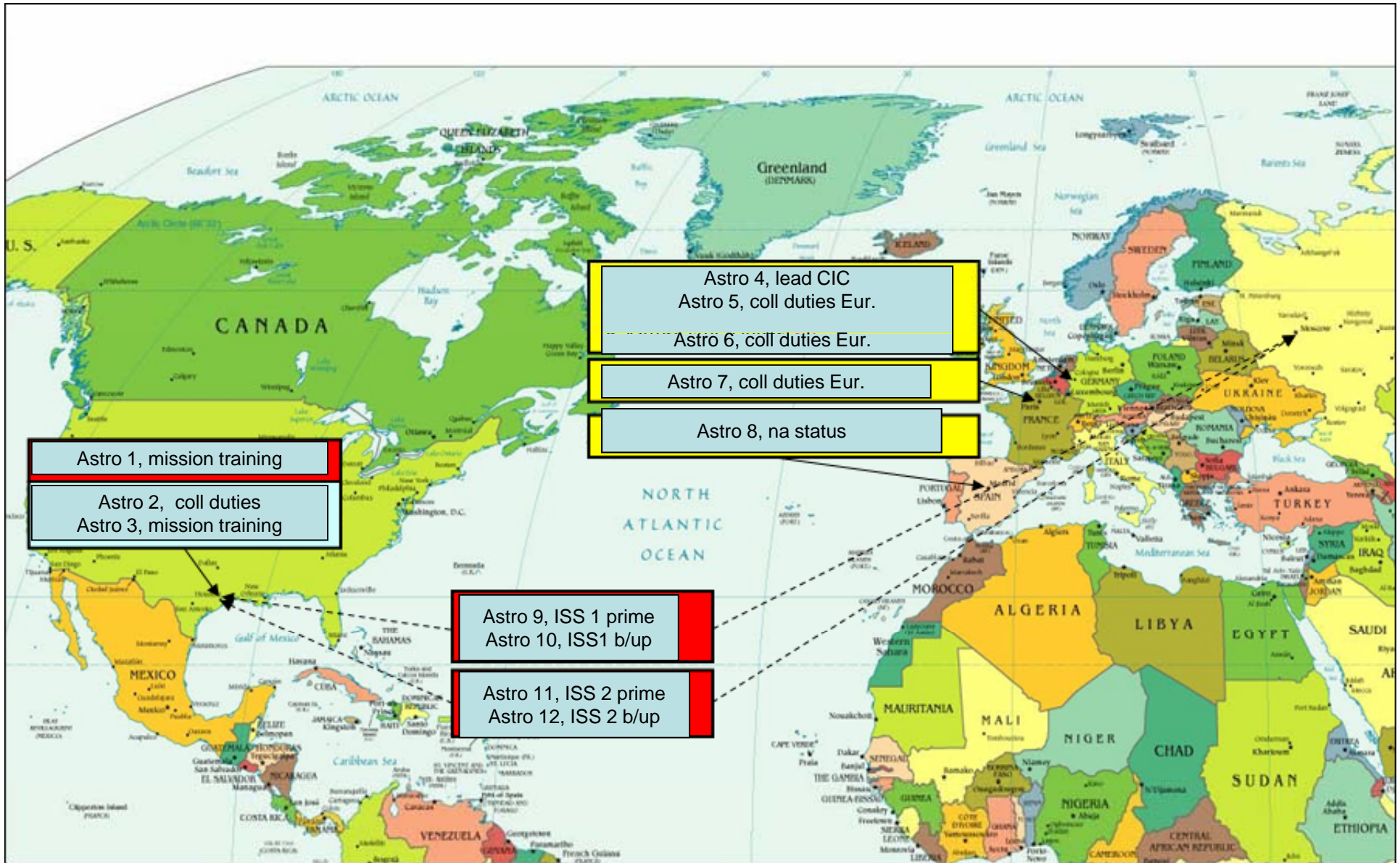
Russia/Gagarin Cosmonaut Training Centre



JAXA/Tsukuba Space Center



Astronauts locations



- Skills training long missions versus task training for short missions
- CBT: computer based training for long missions
- train with 7 crew member, example of the space shuttle, whereas we train by 1 or 2 crews for a fighter.
- language: practise together for ISS in Russian and English