

Astro Pi Challenge

Atelier
13. SWiSE Innovationstag



16. März 2024
Leitung: Magdalena Herová
magdalena.herova@hslu.ch

5 ESA Support Centers in Europe

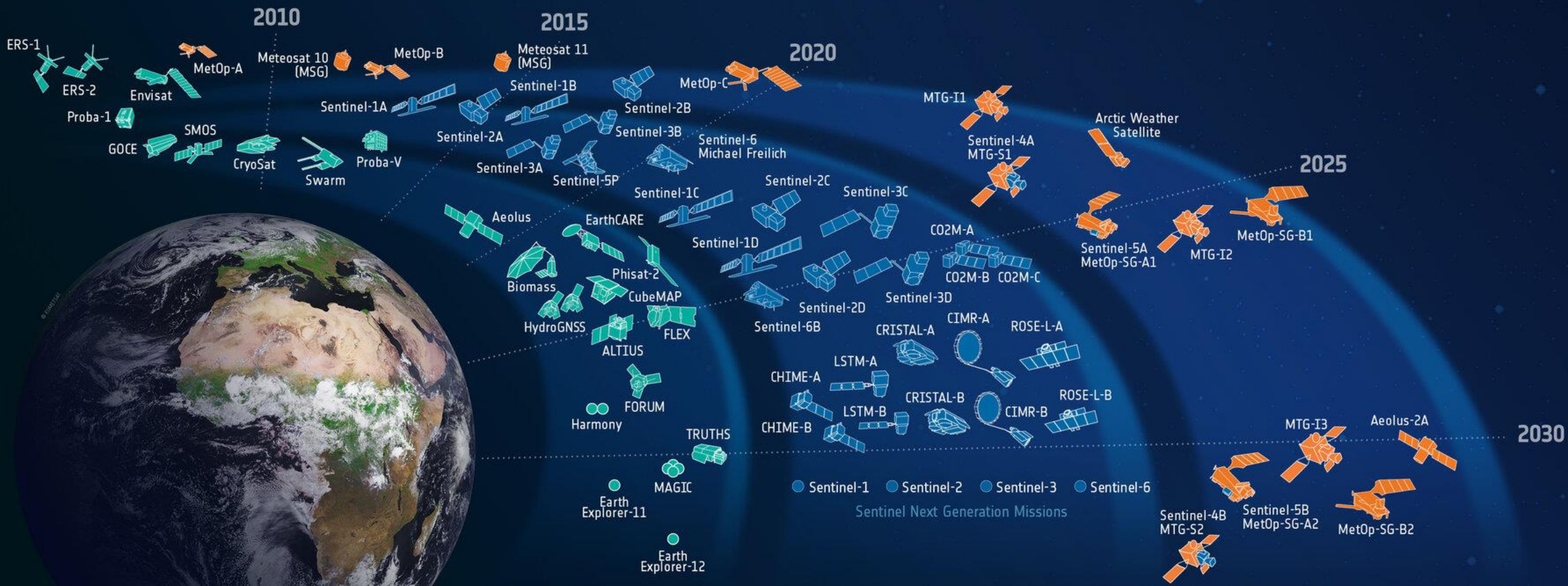


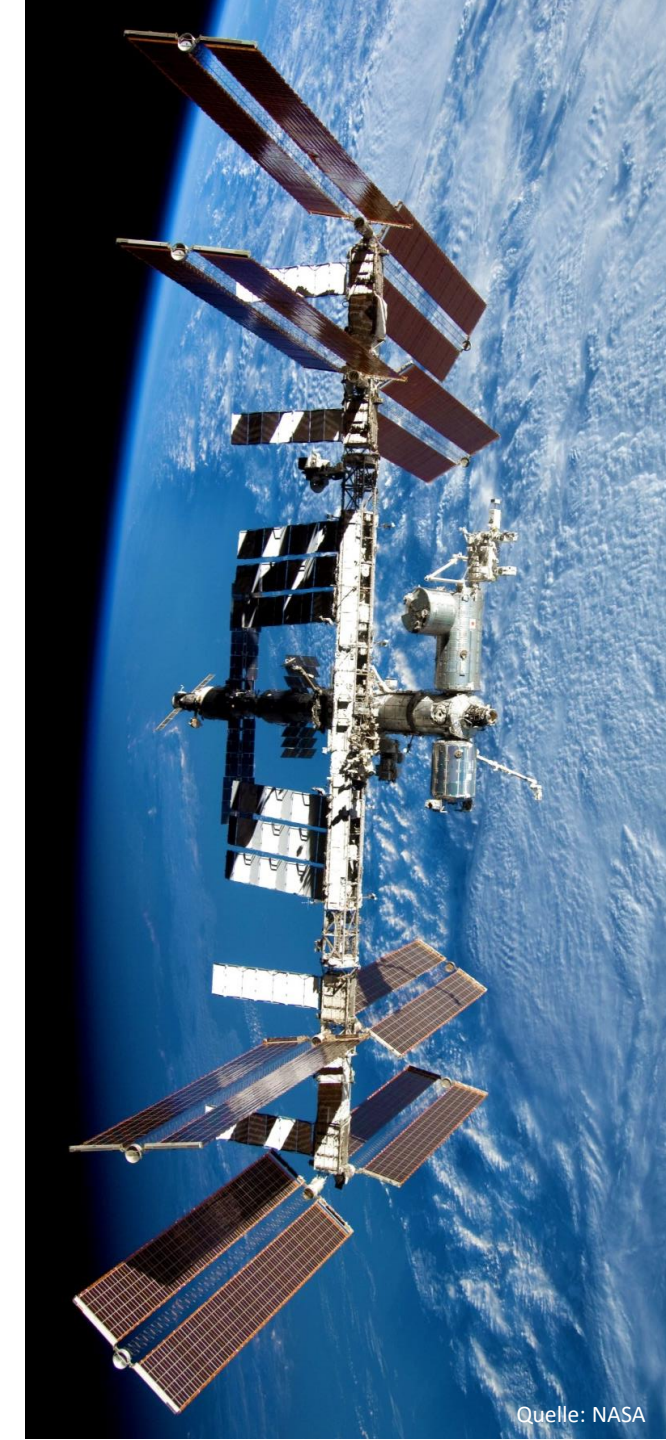
Columbus Control Center in Munich



DISCOVER THE WORLD AROUND YOU
— EARTH DAY —







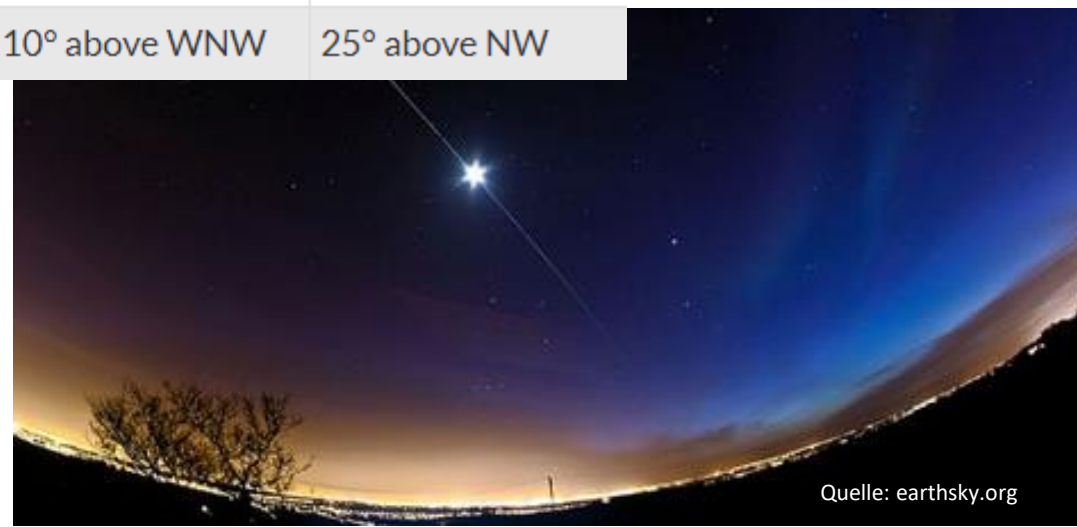
Location: Luzern, Switzerland

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<https://Spotthestation.nasa.gov>



Date	Visible	Max Height*	Appears	Disappears
Sat Mar 16, 7:44 PM	5 min	62°	10° above SW	22° above ENE
Sat Mar 16, 9:21 PM	1 min	20°	10° above W	20° above WNW
Sun Mar 17, 8:33 PM	4 min	50°	10° above W	45° above NNE
Mon Mar 18, 7:45 PM	6 min	65°	10° above WSW	15° above ENE
Mon Mar 18, 9:23 PM	1 min	22°	10° above WNW	22° above NW
Tue Mar 19, 8:35 PM	4 min	37°	10° above WNW	32° above NNE
Wed Mar 20, 7:47 PM	6 min	42°	10° above W	13° above ENE
Wed Mar 20, 9:25 PM	2 min	25°	10° above WNW	25° above NW

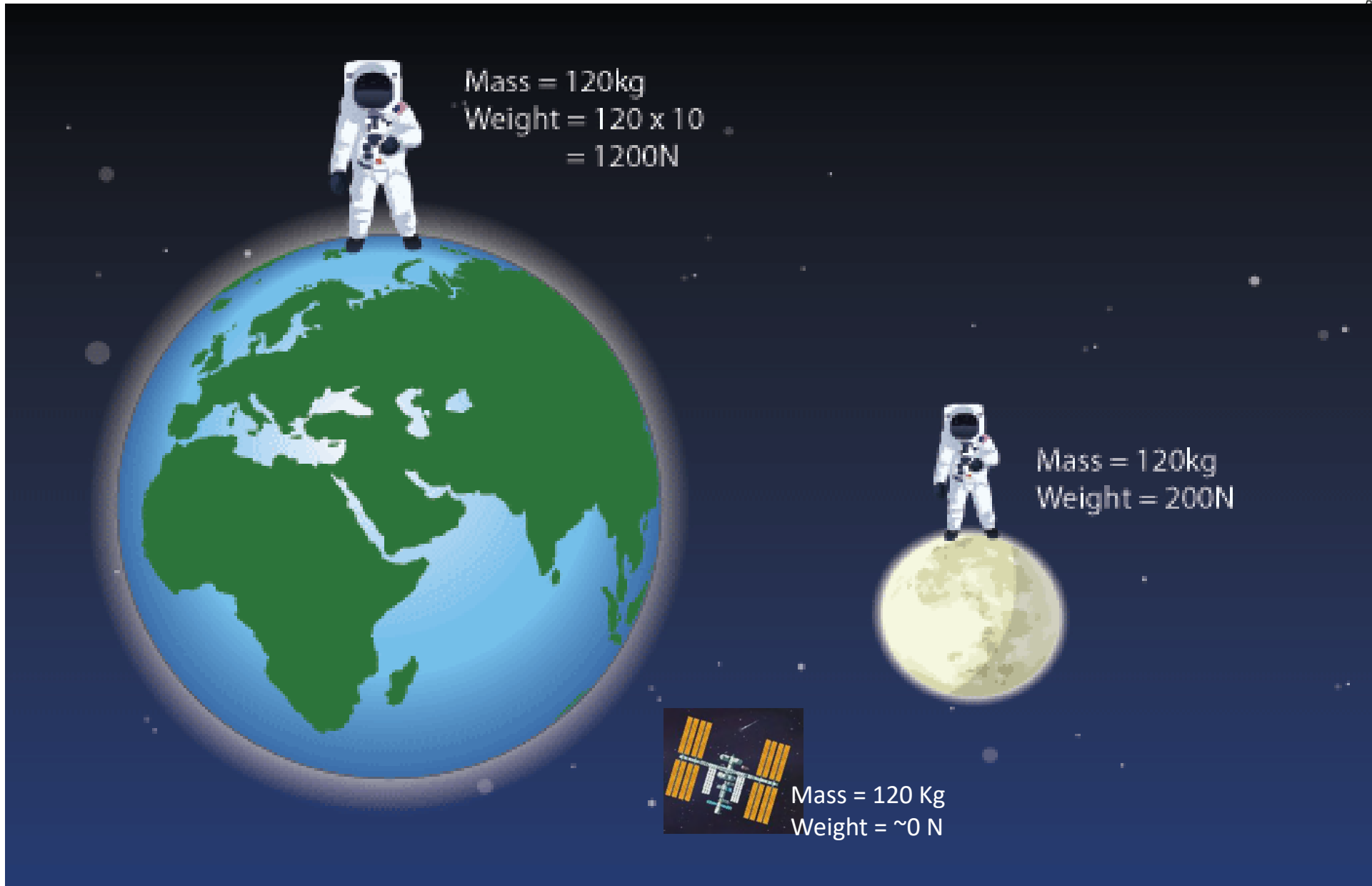


Quelle: NASA

Quelle: earthsky.org



<die Schwerelosigkeit und Strahlung>

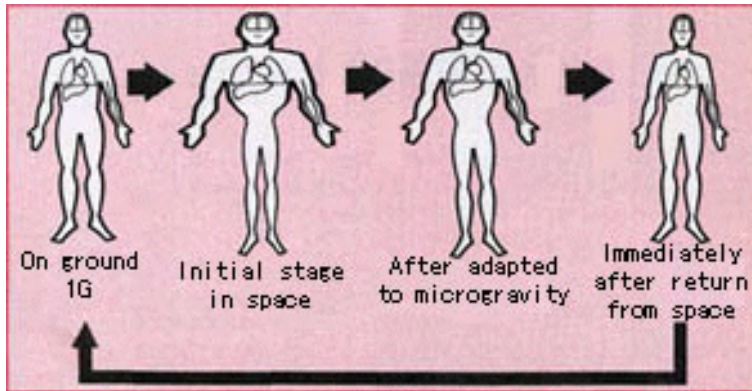




46

WORLD TO THE STARS
Y. GAGARIN
THE STARS

<Schwerelosigkeit hat Einfluss auf Muskel, Knochen, Immunität und viel mehr >



<chicken legs and puffy face>

FEMALE ASTRONAUT

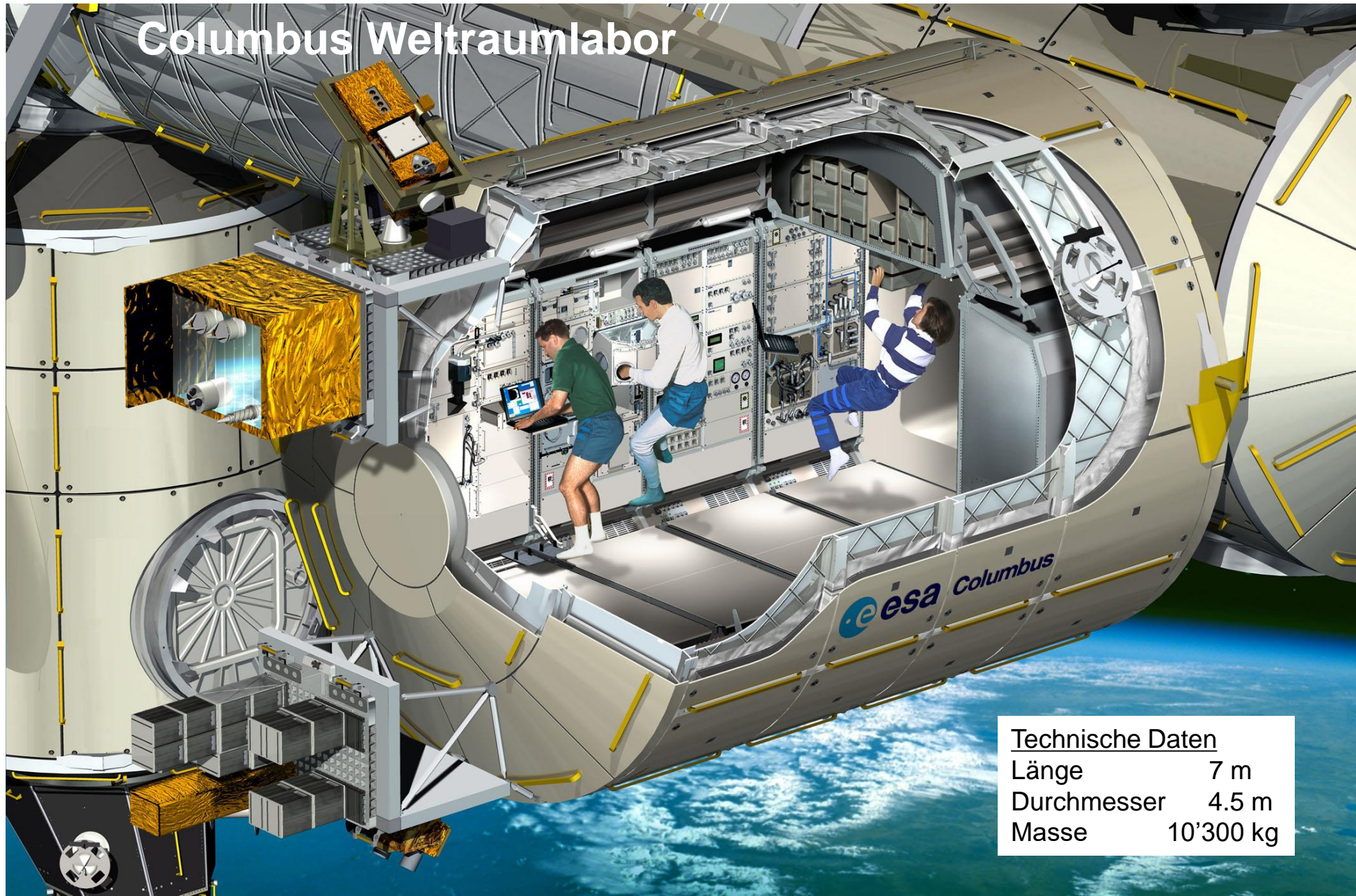
- Women suffer less from hearing loss with advancing age, and do not display a bias towards loss of hearing in the left ear
- Women demonstrate a slight bias towards accuracy versus speed in response to an alertness test
- Women mount more potent immune responses
- Struvite kidney stones more common in women
- Female astronauts, (to date) do not exhibit clinically significant visual impairment
- Female astronauts are more susceptible to orthostatic intolerance
- Urinary tract infections are more common in female astronauts
- Large individual variability to muscle and bone loss in women

MALE ASTRONAUT

- Men suffer more from hearing loss with advancing age, and display a bias towards loss of hearing in the left ear
- Men demonstrate a slight bias towards speed versus accuracy in response to an alertness test
- Men mount less potent immune responses
- Calcium oxalate kidney stones more common in men
- Some male astronauts exhibit clinically significant visual impairment
- Male astronauts less susceptible to orthostatic intolerance
- Urinary tract infections less common in male astronauts
- Large individual variability to muscle and bone loss in men

Health effect observed on Earth (Earth icon) | Health effect observed in space (Space Shuttle icon)

Columbus Weltraumlabor



<u>Technische Daten</u>	
Länge	7 m
Durchmesser	4.5 m
Masse	10'300 kg





AstroPi: Ein Weltraum Computer



Kleiner Computer, entwickelt für SchülerInnen um das Programmieren zu erlernen.

- Programme ausführen
- Daten aus der Umgebung sammeln
- Die Astronauten mit kleinen Spielen unterhalten und Reaktionszeit messen

Sensoren:

- Temperatur
- Feuchtigkeit
- Druck
- Gyroskop
- Magnetometer
- Beschleunigungsmesser
- Farb- und Lichtsensor

- LED Display
- Kamera
- Passive Infrared Sensor (PIR) – Bewegungssensor
- Coral Machine Learning accelerator

European AstroPi Challenge

Programmier-Wettbewerb für SchülerInnen



MISSION ZERO

- Eine Nachricht oder Bild und eine Sensoren-Messung (z.B. Temperatur) am LED Display anzeigen
- Kein HW nötig, Arbeit mit dem Emulator
- In allen ESA Sprachen – Deutsch, Französisch, Italienisch,



MISSION SPACE LAB

- Experiment entwerfen, dass Sensoren auf dem AstroPi benutzt und Daten ausgewertet oder Fotos aus dem Fenster der ISS macht
- SchülerInnen Teams arbeiten daran zwischen Oktober und Februar
- Sprache: English





MISSION ZERO

Mission Zero 2023/2024

Lets give it a try

Challenge-Start

18. September 2023

Mentoren registrieren ihre Teams und junge Menschen arbeiten an ihren Mission Zero-Programmen.

Challenge-Ende

25. März 2024

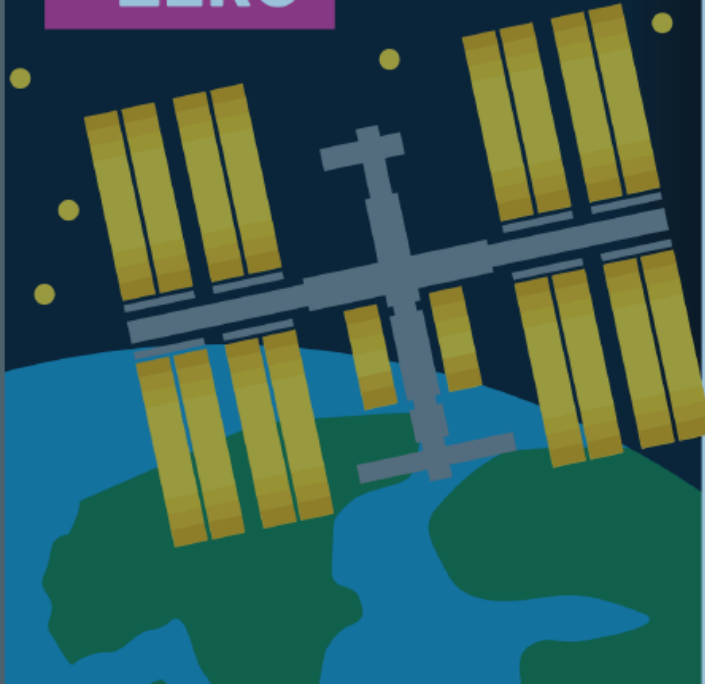
Die Programme müssen bis zu diesem Datum eingereicht werden, damit sie auf der ISS ausgeführt werden können.



- Das Thema von Mission Zero 2023/24 ist 'Flora und Fauna'. Die Bilder können jeden Aspekt dieses Themas darstellen, solange sie den offiziellen Richtlinien entsprechen, beispielsweise Blumen, Bäume, Tiere oder Insekten.
- Step by step guide: <https://projects.raspberrypi.org/en/projects/astro-pi-mission-zero>

**EUROPEAN
ASTRO PI
CHALLENGE
2021-2022**

**MISSION
ZERO**



Certificate of participation

This is to certify that

Luca Cisotta

Hendrik Huber


from team


Luca&Hendrik

from

Hochschule Luzern STEMs Program

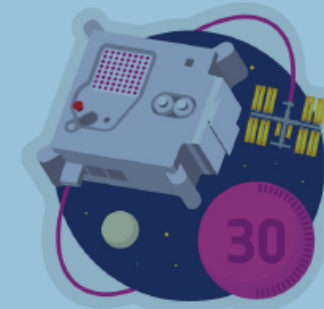
had their computer program run on the International Space Station
as part of Mission Zero 2021-2022.


Hugo Marée
Head of ESA Education Office


Philip Colligan
CEO of Raspberry Pi Foundation


Samantha Cristoforetti
ESA Astronaut

**MISSION
ZERO**



ASTRO PI

MISSION ZERO

Your program ran at the following coordinates:

-51.2498,-47.3179



ASTRO PI



It ran from

2022-06-01 08:55:00

to

2022-06-01 08:56:00

Mission Zero ausprobieren

Emulator: <https://rpf.io/mzcode>

Schritt für Schritt Anleitung: <https://projects.raspberrypi.org/de-DE/projects/astro-pi-mission-zero>

RGB calculator: https://www.w3schools.com/colors/colors_rgb.asp



MISSION SPACE LAB

Mission Space Lab 2022/2023

Solve a scientific task in space

- Mission Space Lab Creator Guide
- ISS Speed Project Guide
- Mission Space Lab mentor Guide



Challenge launch

6 November 2023

Mentors register their teams

Create

6 November 2023 – 19 February 2024

Teams write and test their programs

Mentors submit their teams' completed programs

Astro Pi Mission Control tests and assesses each submitted program

Deploy

April – May 2024:

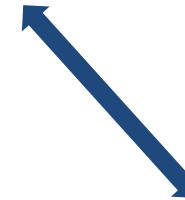
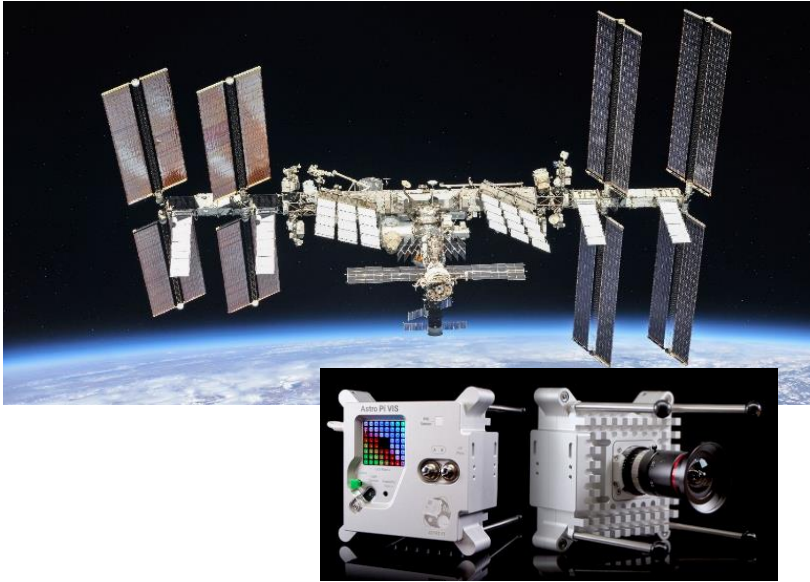
Programs that pass testing and assessment are awarded 'flight status' and deployed on board the ISS.

Certificates

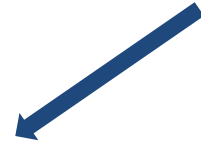
May – June 2024:

Teams receive the data their program has gathered while running on the ISS, and a certificate of participation.

BIOTESC – das Schweizer ESA Supportzentrum



Columbus Control Centrum
in München



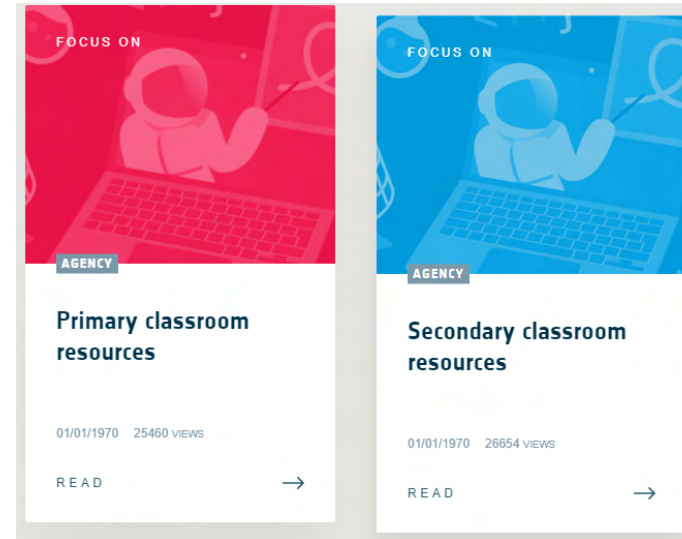
Biotesc Supportzentrum, Hergiswil



Inspiration – Weltallthemen im Unterricht

ESA teach with space

<https://www.esa.int/Education>



ESA Academy, ESA Teacher's Corner

ESERO Deutschland, ESERO Österreich

<https://esero.de/>

<https://ars.electronica.art/esero/de/>