

AUSTRIA IN SPACE

COPUOS Scientific and Technical Subcommittee
55th Session

29 January 2018



Space as an integral part of Austria's national innovation system

- *Political Value:* international cooperation and contribution to a European strategic interest ("infrastructure of the 21st century")
- *Scientific and Technical Value:* competence in a high tech sector and international visibility
- *Economic Value:* industrial competitiveness, opportunities for SMEs, employment growth
- *Humanitarian Value:* benefit for the society
- *Educational Value:* inspiring young generations and attracting best talents

AUSTRIAN SPACE ACTIVITIES: 3 PILLARS



Austrian Space Applications Programme

- annual calls
- 16 years ASAP



ESA

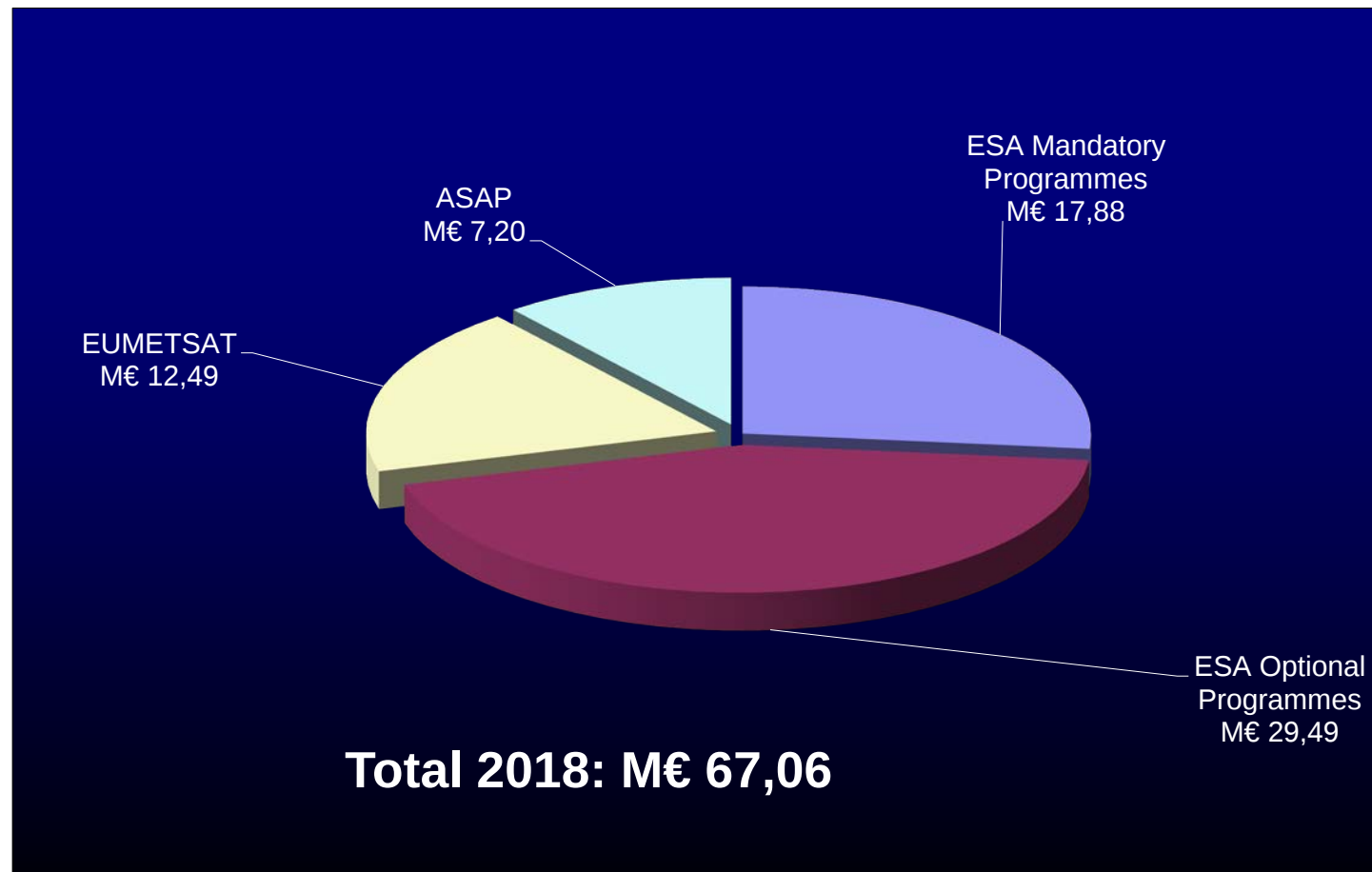
- Optional Programmes
- Mandatory Programme



EU

- COPERNICUS
- GALILEO
- Space Surveillance and Tracking

AUSTRIAN SPACE BUDGET 2018



ESA's Backbone: Science Instruments, Multi-Layer Insulation, Satellite Structures and Mechanisms, Electrical Ground Support Equipment



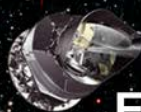
→ ESA'S FLEET ACROSS THE SPECTRUM



Thanks to cutting edge technology, astronomy is unveiling a new world around us. With ESA's fleet of spacecraft, we can explore the full spectrum of light and probe the fundamental physics that underlies our entire Universe. From cool and dusty star formation revealed only at infrared wavelengths, to hot and violent high-energy phenomena, ESA missions are charting our cosmos and even looking back to the dawn of time to discover more about our place in space.

MLI

planck
Looking back
at the dawn of time

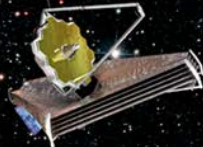


MLI

herschel
Unveiling the cool
and dusty Universe


jwst

Observing the first light


cheops

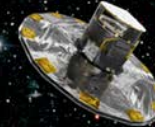
Sizing and first characterisation
of exoplanets



MLI

gaia

Surveying a billion stars


euclid

Exploring the dark Universe



EGSE

EGSE


hst

Expanding the frontiers
of the visible Universe



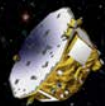
MLI

xmm-newton

Seeing deeply into the hot
and violent Universe


**lisa
pathfinder**

Testing the technology
for gravitational
wave detection



MLI

MLI

integral

Seeking out the extremes
of the Universe



microwaves

sub-millimetre

infrared

optical

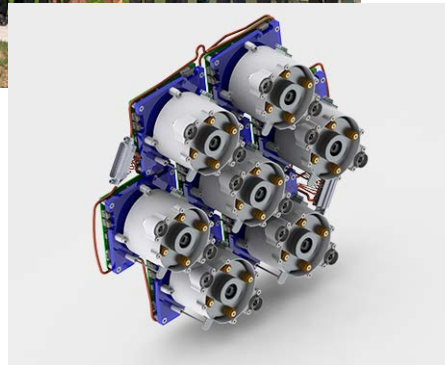
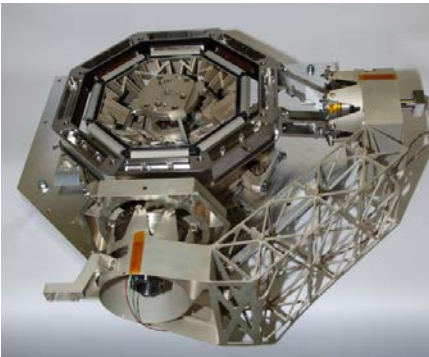
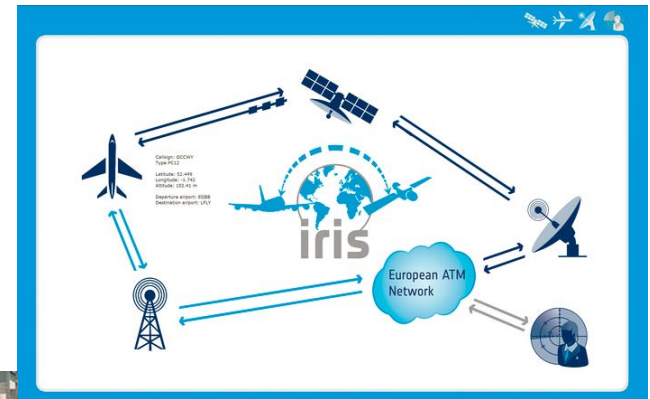
ultraviolet

x-rays

gamma rays

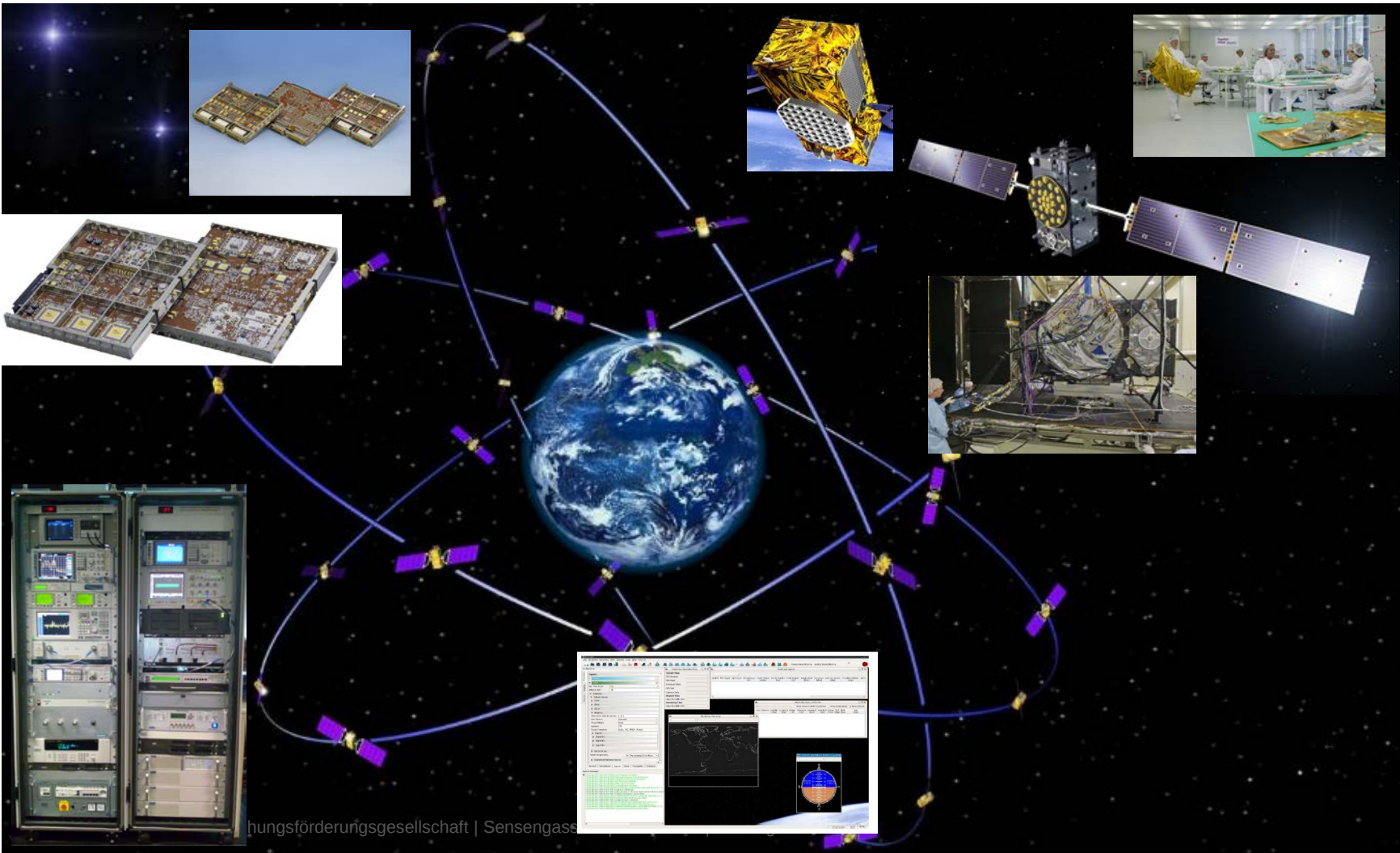
Technology - Telecommunications

Material Testing (ALM), Radiation Hardening, Components for Ariane (Feedlines), Microthrusters, Electric Propulsion Pointing Mechanisms, Quantum Technology for Space, Satcom for Air Traffic Management



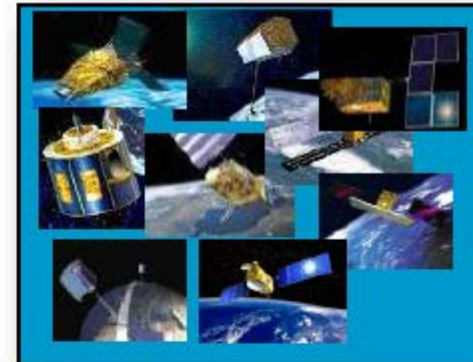
European Space Infrastructure (1) GALILEO

Thermal Insulation, EGSE, CPU Interface Electronics





Sentinels



Contributing missions

Services



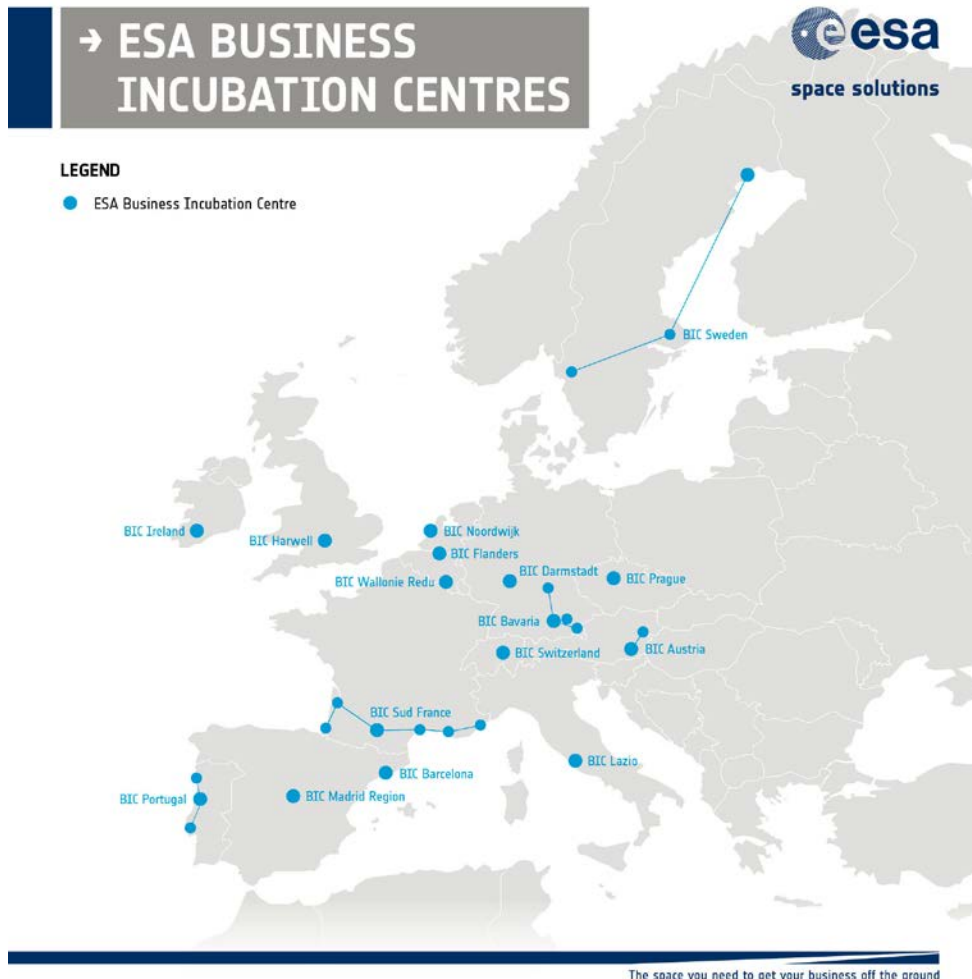
...added-value products



in-situ

Space for Economic Growth

ESA BUSINESS INCUBATION CENTRES - ESA BIC AUSTRIA



Start-up Support, Transfer of
Space Technology



Building up the infrastructure of the 21st century
and providing services to the citizens

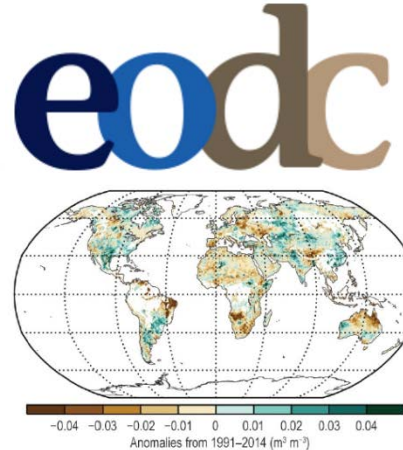
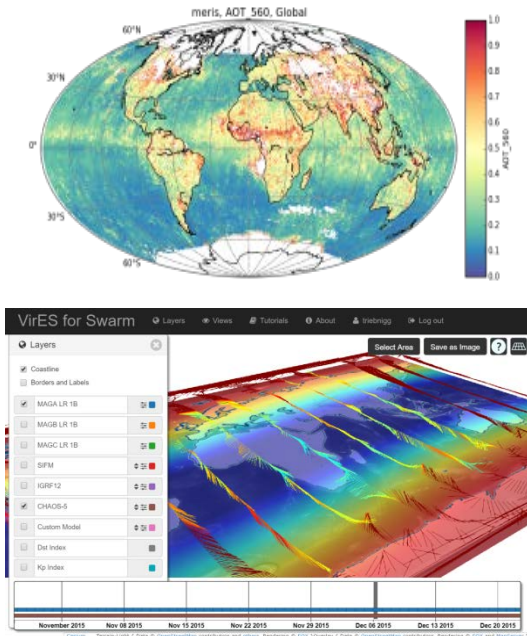
- Environment
- Water and Air Quality
- Land Usage
- Climate Change
- Health Services
- Education
- Innovation
- Partnerships



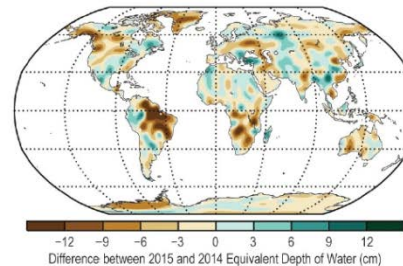
Earth Observation Cluster

Earth Observation Data Centre on Water Resources Monitoring

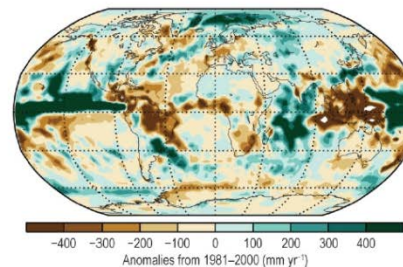
Data Intelligence Austria



(g) Terrestrial Water Storage



(h) Precipitation



Selected global clients

International Institutions

European Union, European Environment Agency, International Fund for Agricultural Development, European Space Agency, United Nations Programmes

International Development Banks

World Bank, European Investment Bank, EuropeAid

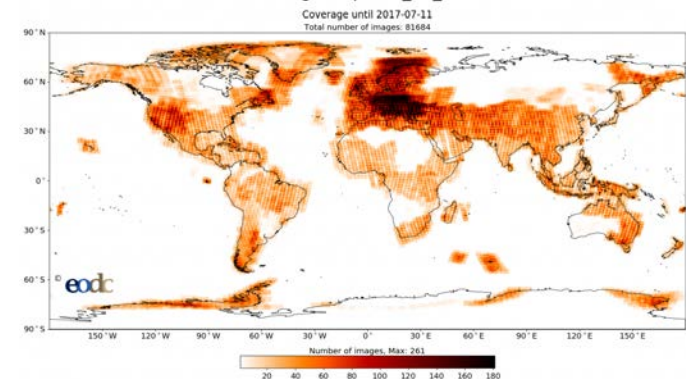
National & regional authorities

Various ministries and agencies for environment, agriculture, forestry, research and transportation worldwide

Private sector

Telecommunication, Consulting, Construction, Financial Sector, Oil & Gas

Coverage Map S1A_IW_SLC



EODC is a **public-private partnership** founded in 2014

- Establish, manage and operate a joint IT infrastructure offering **Big EO Data storage**
- **Global soil moisture monitoring as part of Copernicus Climate Change Service**

DriDanube Drought Risk in the Danube Region

Proactive drought management
→ Increased culture of preparedness



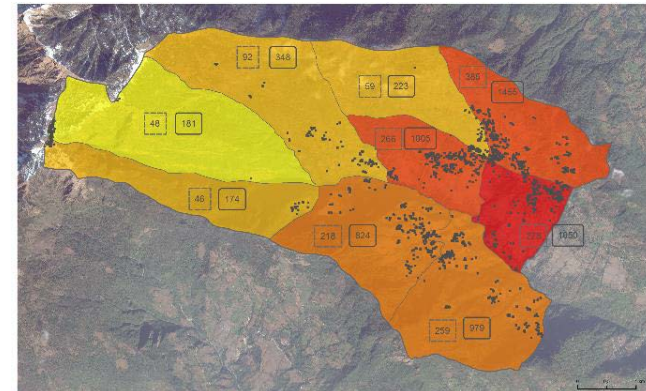
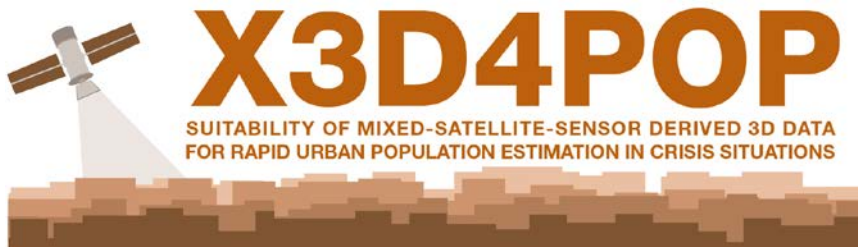
Population monitoring

- EO-based camp monitoring
- EO-based method for population estimation in urban areas
- Methods to detect displaced people in (urban) settlements

Users:

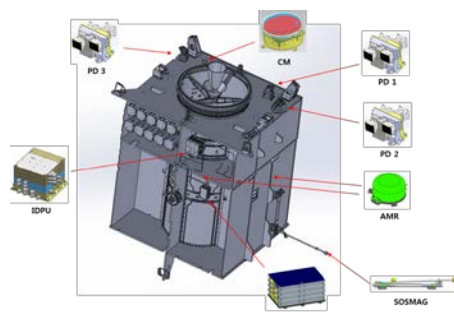
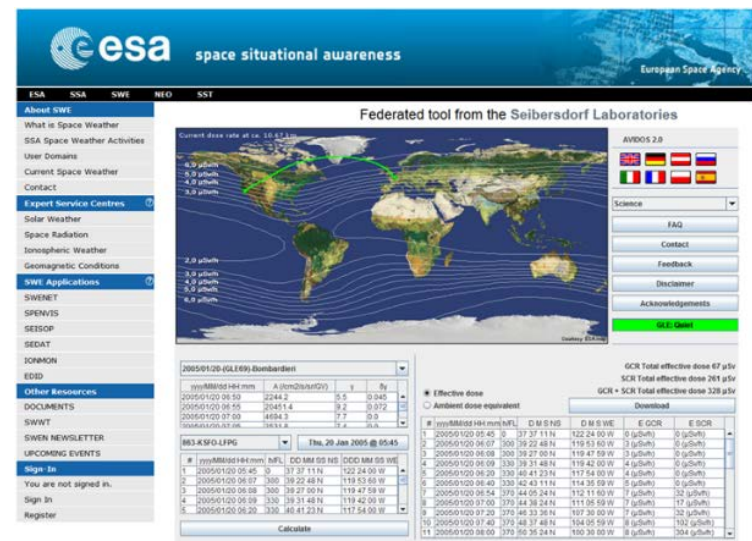
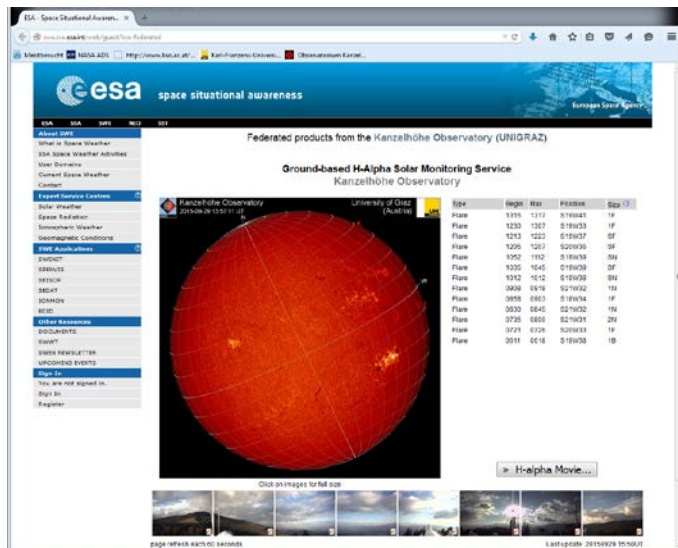
Red Cross, Doctors without Borders

Follow-up Project:



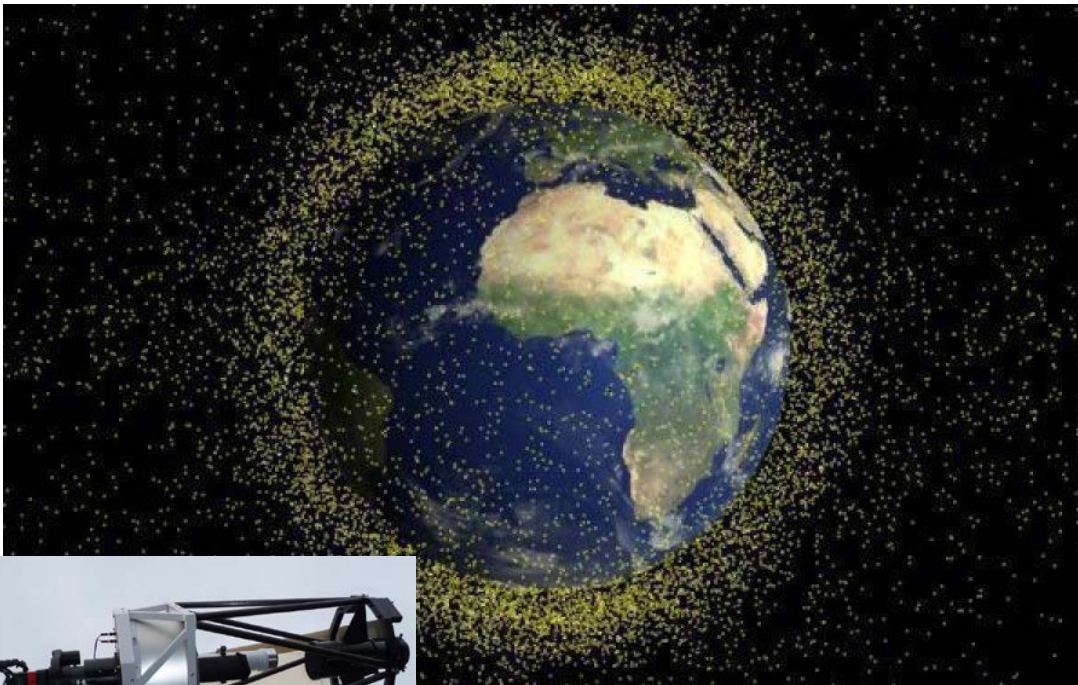
Dedicated stereo satellite image pairs for 3D models

Space Situational Awareness Space Weather

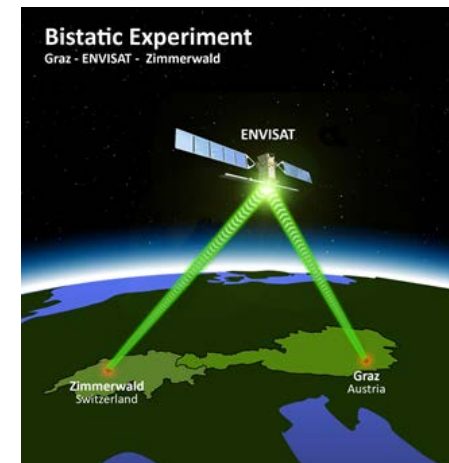


Austria contributes to
**Expert Service
Centres** within ESA's
SSA Programme

Austria plays an active role!

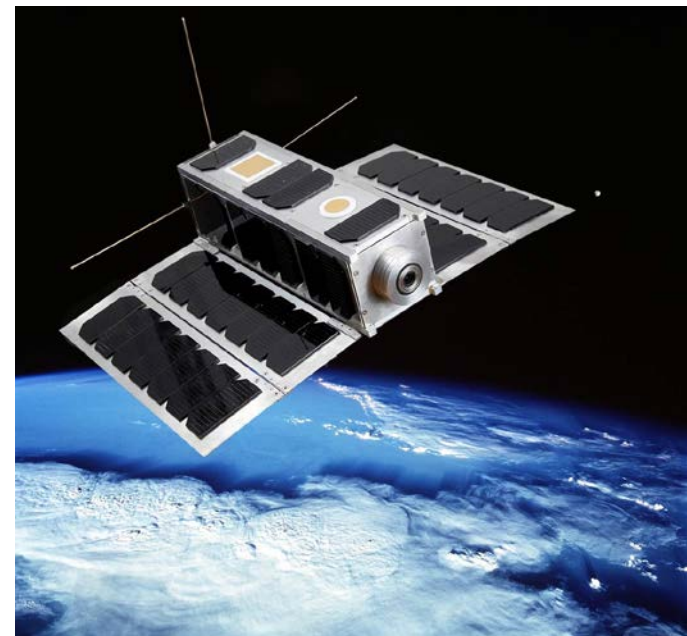
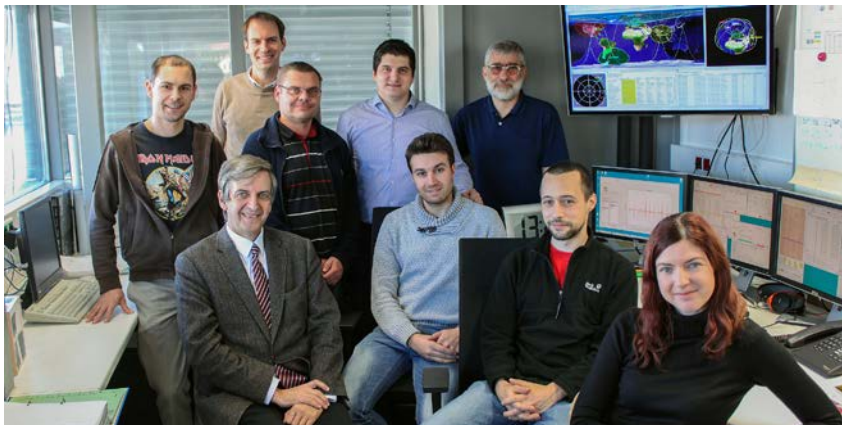
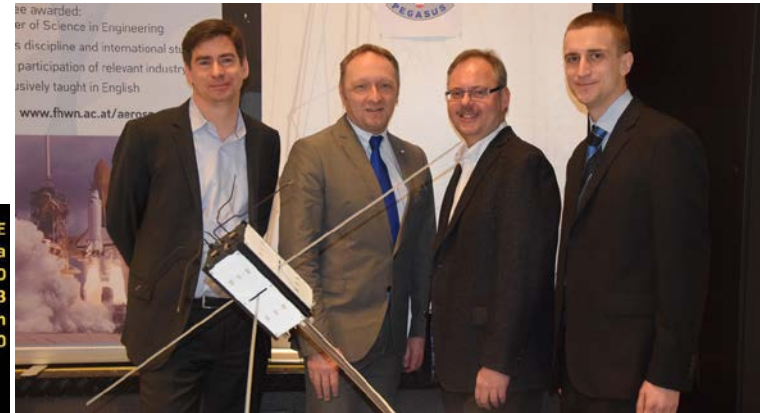
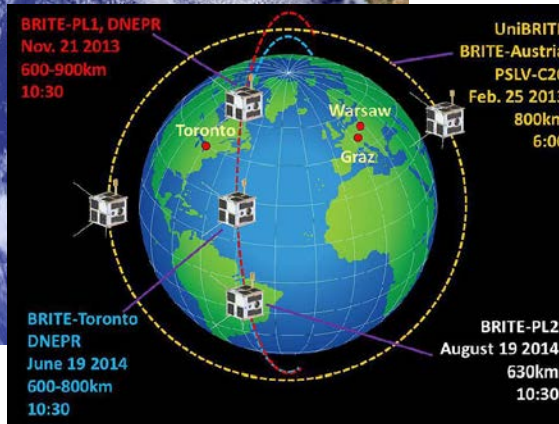
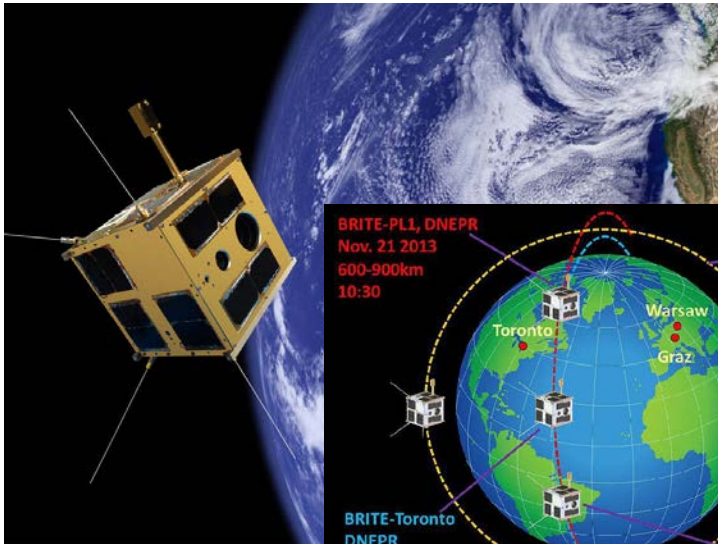


Satellite Laser Ranging for Space Debris Monitoring

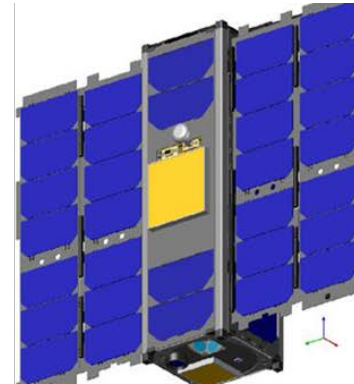


CubeSats made in Austria

AUSTRIAN CUBESAT INITIATIVE, TUGSAT-1, UniBRITE, PEGASUS/QB50, OPS-SAT, PRETTY



CubeSat History in Austria:



- **TUGSAT-1 and UniBrite-1 launched on 25 February 2013**
- **Nano-Satellite Pegasus as part of QB-50 Constellation**
- **OPS-SAT: Validation of new operational concepts**
- **PRETTY: Measurements of oceanic wave movements and glacier ices**

CubeSats have scientific, technical, environmental and educational merits



News



ESA „Robotics and Automation“ Lehrerinnen Fortbildungen – Anmeldung jetzt möglich!

Im Jänner und Februar bietet die ESA für Lehrkräfte der Sekundarstufe Fortbildungen zum Thema Robotik und Automation an. Die Kurse finden am ESEC Standort der ESA in Belgien statt. Themen der Fortbildungen sind Robotik und Automationstechnik, sowie deren Einsatz in den MINT-Fächern. Aber auch Wege und Möglichkeiten für forschungs-basiertes Lehren und Lernen sind Teil dieser Kurse, die für alle MINT Lehrkräfte der Sekundarstufe offen sind.



Anruf ins Weltall!

Am 4.12.2017 bietet ESERO Austria Lehrerinnen und Lehrern eine außergewöhnliche Möglichkeit! Im Rahmen eines sogenannten In Flight Calls werden wir im Ars Electronica Center live mit der ISS verbunden sein und mittels Videokonferenz mit dem italienischen Astronauten Paolo Nespoli sprechen.



Mission X 2018 – All Systems Go!

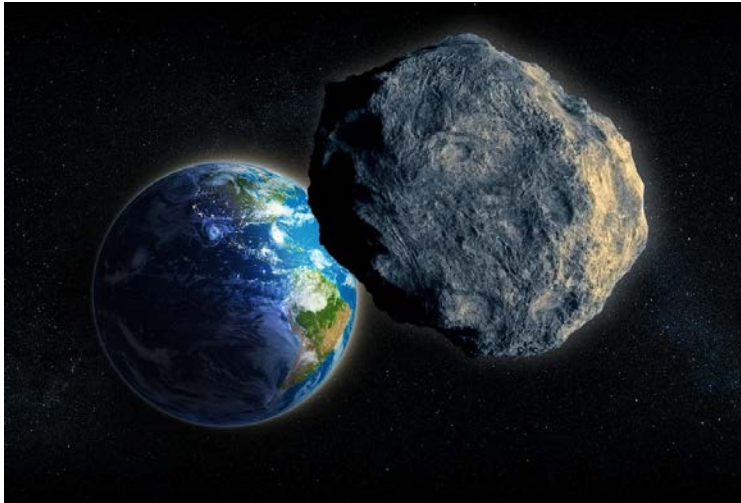
Mission X – Train Like an Astronaut ist ein internationaler Wettbewerb für Schulen, der 2017/18 zum achten Mal weltweit durchgeführt wird. Die amerikanische und europäische Weltraumorganisationen NASA und ESA haben für Mission X eine Reihe von Übungen entwickelt, die Kindern viel Spaß an Weltraumwissen, Bewegung, Sport, sowie die Bedeutung gesunder Ernährung im täglichen Leben vermitteln.



European Space Education Resource Office

ESERO Austria (since mid 2016)

CANSAT Competition in Austria in April 2018



Summer School Alpbach 2018: Sample Return from Small Solar System Bodies

July 17-26, Alpbach/Tyrol





NEWS

ESPI BRIEF 19. REIGNITING EUROPE'S LEADERSHIP IN DEBRIS MITIGATION EFFORTS

12 January 2018. In the past decade, the count of trackable debris fragments has more than doubled, driven by collisions in space, several high-profile ASAT tests, the proliferation of cubesats and growing number of upper stages left in orbit. Additional European leadership will be needed to fully respond to the emerging space traffic challenges presented by various trends including the incoming LEO mega-constellations and increased risk of collisions.

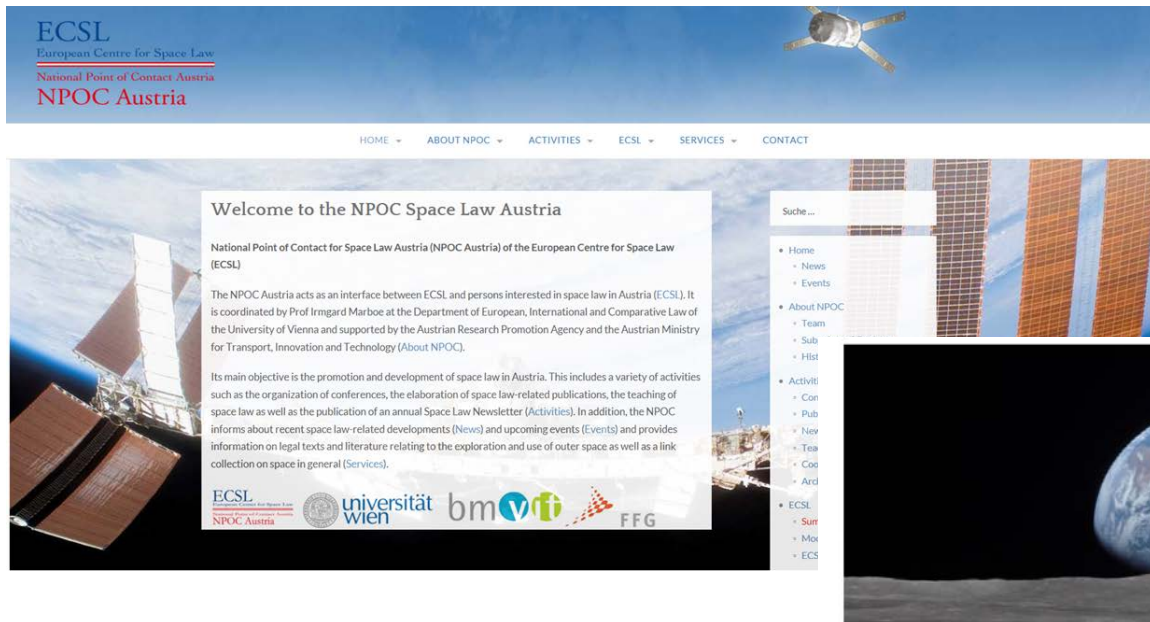
The ESPI Brief 19 provides an overview of the growing concern of orbital debris, Europe's efforts in this domain, and proposes a way to break the international deadlock in debris mitigation efforts. Download the ESPI Brief 19 [here](#).

Yearbook on Space Policy



UNITED NATIONS
Office for Outer Space Affairs





**United Nations/Austria Symposium on
"Access to Space: Holistic Capacity-Building for the 21st Century"**

GRAZ, AUSTRIA, 3 - 7 SEPTEMBER 2017

The Austrian Space Law specifically requires compliance with internationally recognised Space Debris Mitigation Guidelines.

Thank you for your attention!



Austria looks forward to a continued excellent cooperation with COPUOS and its Member States and to a successful UNISPACE+50!