

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



>asap>

Austrian Space Applications Programme

- annual calls
- 16 years ASAP



ESA

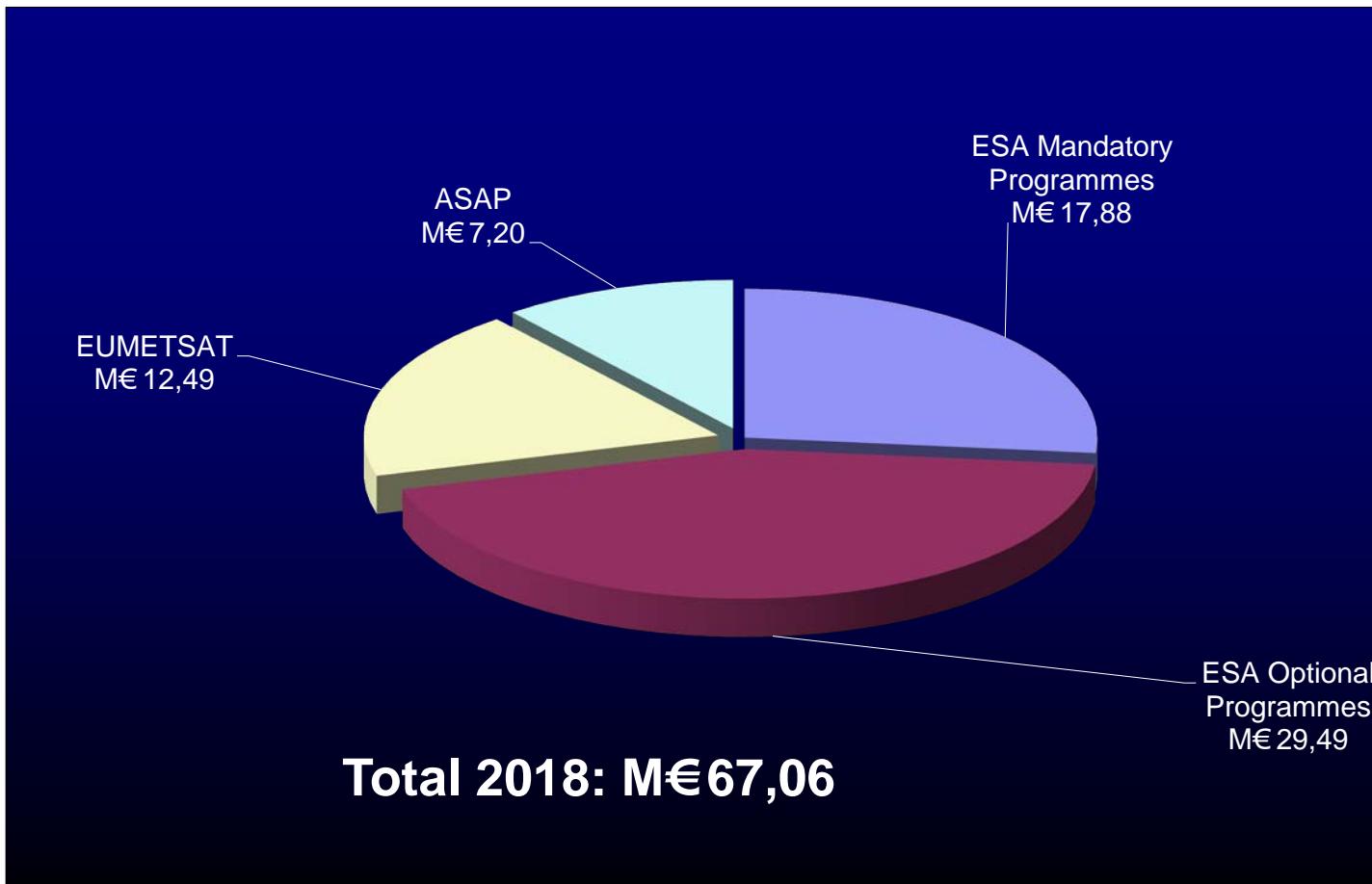
- Optional Programmes
- Mandatory Programme



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.

The diagram illustrates the full spectrum of light explored by ESA's fleet of spacecraft, from microwaves to gamma rays. The spectrum is shown as a circular arc at the bottom, with labels for microwaves, sub-millimetre, infrared, optical, ultraviolet, x-rays, and gamma rays. Various ESA missions are highlighted throughout the diagram:

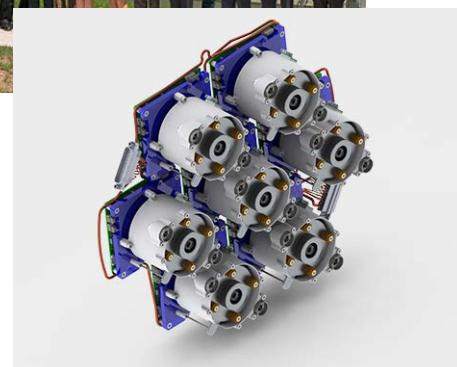
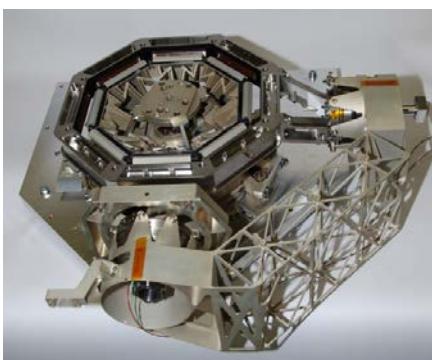
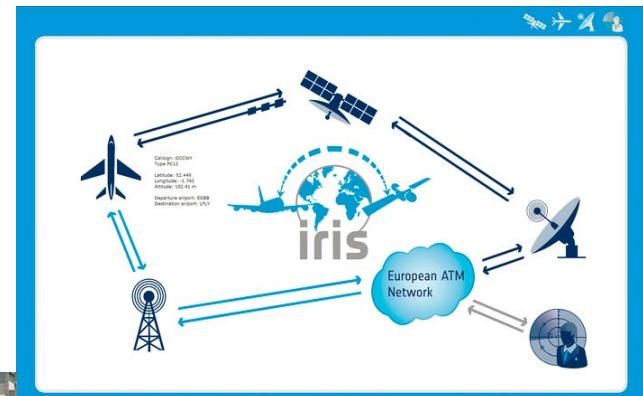
- MLI**: Planck (Looking back at the dawn of time), Herschel (Unveiling the cool and dusty Universe), Just (Observing the first light), Cheops (Sizing and first characterisation of exoplanets), Euclid (Exploring the dark Universe), HST (Expanding the frontiers of the visible Universe), XMM-Newton (Seeing deeply into the hot and violent Universe), Integral (Seeking out the extremes of the Universe).
- EGSE**: Lisa Pathfinder (Testing the technology for gravitational wave detection).
- MLI**: Gaia (Surveying a billion stars).

www.esa.int

European Space Agency

Technology - Telecommunications

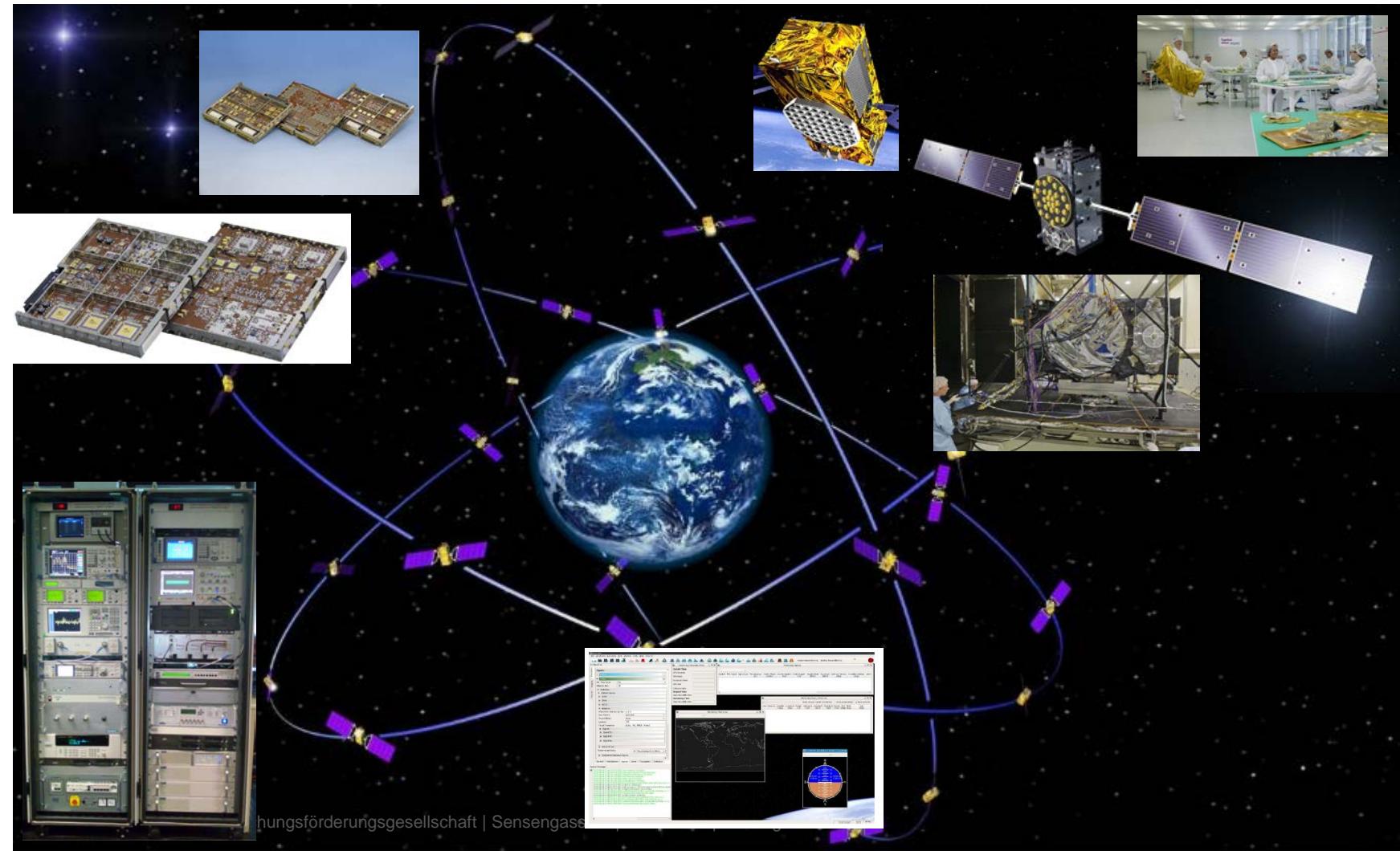
Material Testing (ALM), Radiation Hardening, Components for Ariane (Feedlines), Microthrusters, Electric Propulsion Pointing Mechanisms, Quantum Technology for Space, Satcom for Air Traffic Management



European Space Infrastructure (1)

GALILEO

Thermal Insulation, EGSE,
CPU Interface Electronics



European Space Infrastructure (2)

Copernicus

POD GPS/GNSS Receivers, MLI,
On-Board Computer, EGSE



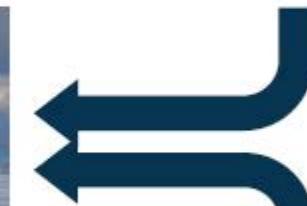
Sentinels



Services



Contributing missions



in-situ



...added-value products

Space for Economic Growth

ESA BUSINESS INCUBATION CENTRES -

ESA BIC AUSTRIA



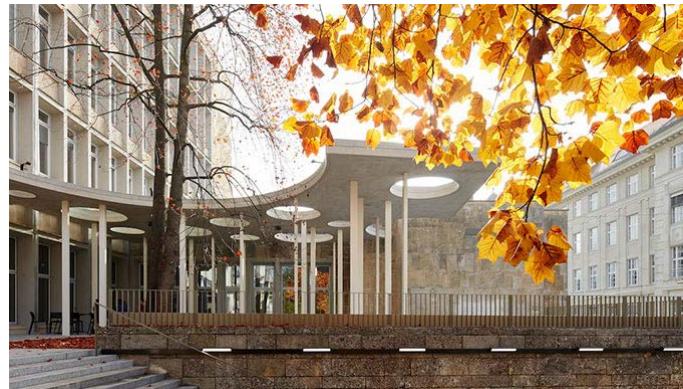
→ ESA BUSINESS INCUBATION CENTRES

LEGEND

- ESA Business Incubation Centre



Start-up Support, Transfer of
Space Technology



Contribution to UN Sustainable
Development Goals

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

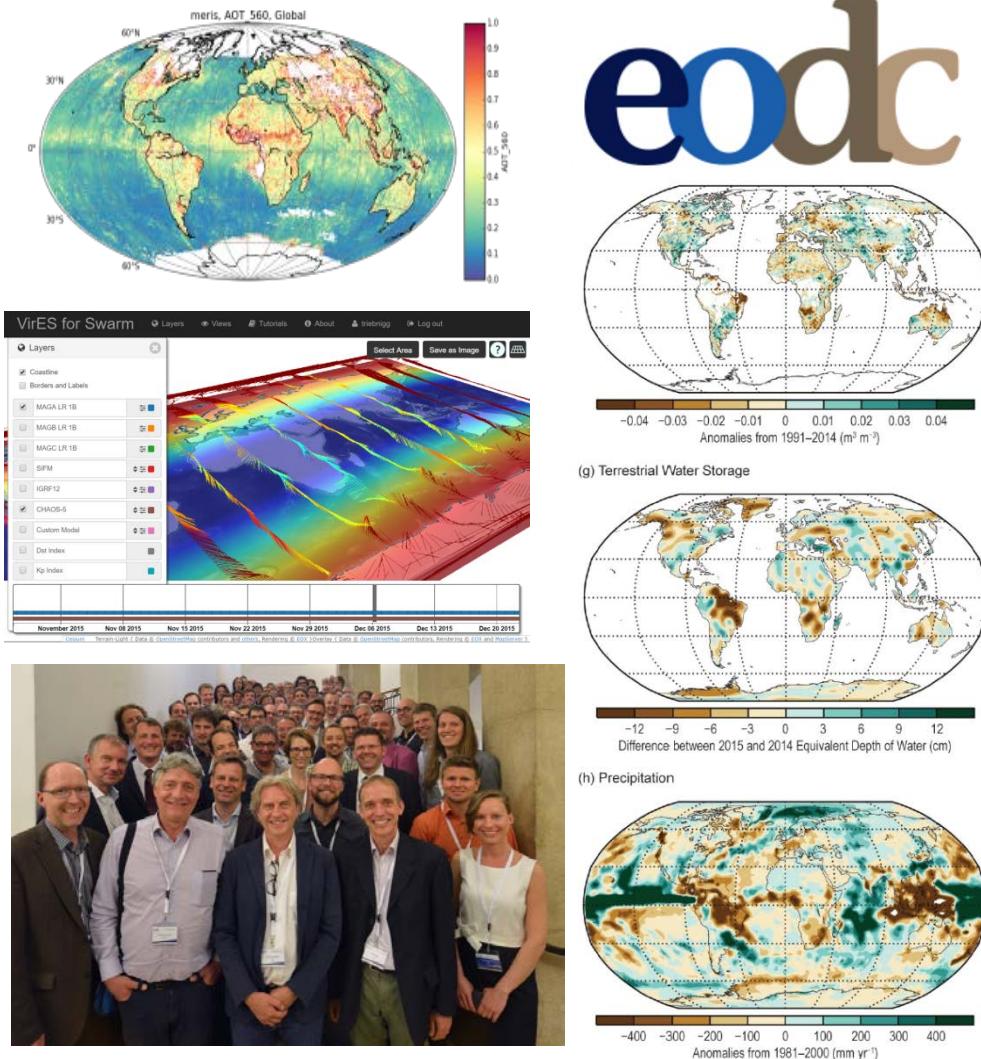
- Environment
- Water and Air Quality
- Land Usage
- Climate Change
- Health Services
- Education
- Innovation
- Partnerships



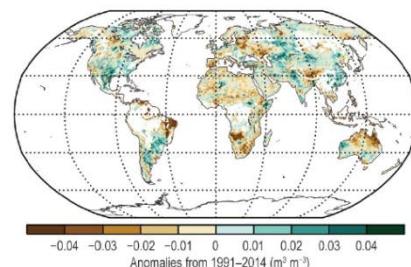
Earth Observation Cluster

Earth Observation Data Centre on Water Resources Monitoring

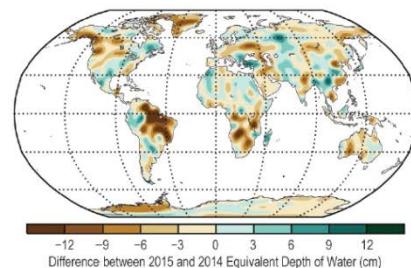
Data Intelligence Austria



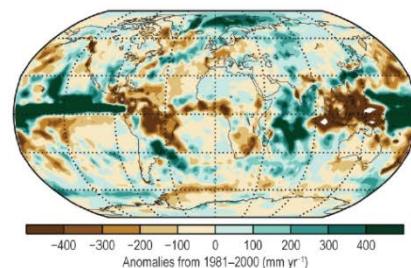
eodc



(g) Terrestrial Water Storage



(h) Precipitation



Selected global clients

esa European Environment Agency



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



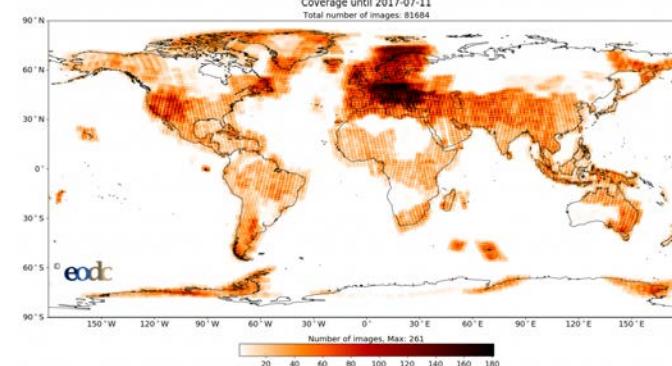
Private sector

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



Coverage Map S1A_JW_SLC

Coverage until 2017-07-11
Total number of images: 81684



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



Earth Observation for Humanitarian Actions: EO4HumEn+

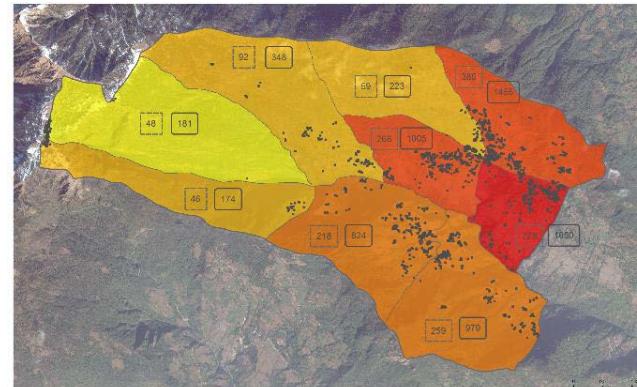
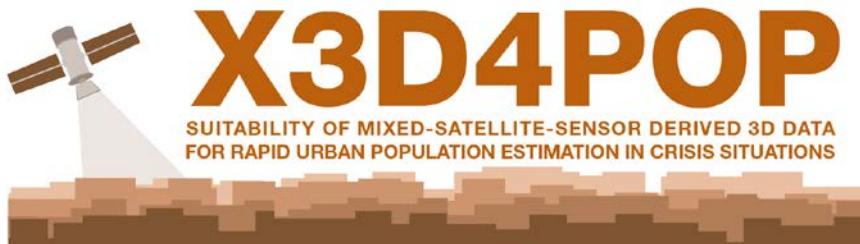
**FFG**

Population monitoring

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

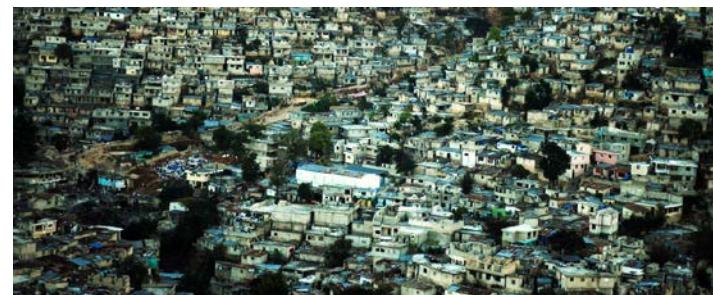
Users:
Red Cross, Doctors without Borders

Follow-up Project:



Population density / ward
high
low
48 number of buildings / ward
181 number of people / ward
extracted buildings
administrative wards

Save the date
SPOT
Acquisition date: 26/12/2011
Coverage: CNE
Source: AERIALS
Administrative units
Vector data
Administrative units
Source: AERIALS



Dedicated stereo satellite image pairs for 3D models

Space Situational Awareness

Space Weather



FFG

ESA - Space Situational Awareness

[Home](#) [About](#) [Federated](#) [Media](#) [NASA ADS](#) [https://ssd.iaf.org.at/](#) [Kanzelhöhe Observatory](#) [Biancamerano X-ray](#)

esa space situational awareness

Biancamerano X-ray

Alerts SSW USA TSPW MHD MET

Alerts SSW

What is Space Weather
Solar and Geospace Activities
User Demands
Current Space Weather
Contact

Solar Weather

Solar Flare
Space Radiation
Geomagnetic Weather
Geosynchronous Condition

Earth Atmospheres

ENVIRO
EMRATTS
TECHIC
DESAT
SONOM
REED

Other Resources

GOES-15
EVE
ENVER NEWSLETTER
UPCOMING EVENTS
[Helpdesk](#)

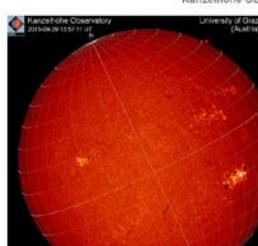
You are not signed in.
Sign In
Register

Federated products from the Kanzelhöhe Observatory (UNIGRAZ)

Ground-based H-Alpha Solar Monitoring Service

Kanzelhöhe Observatory

Ranzelhöhe Observatory University of Graz (Austria)

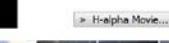


Click on images for full size

Type	Date	Height	Area	Polarization	Size
flare	1235	1317	51W053	1F	10
flare	1235	1317	51W053	DF	10
flare	1235	1317	51W053	SF	10
flare	1235	1317	51W053	SN	10
flare	1235	1317	51W053	DN	10
flare	1235	1045	01W029	DF	10
flare	1235	1045	01W029	DN	10
flare	0609	5118	92W052	1M	10
flare	0658	0603	51W054	1F	10
flare	0633	0643	02W052	1M	10
flare	0735	0657	02W052	2M	10
flare	0735	0657	02W052	1M	10
flare	0511	0618	51W058	1B	10

> H-alpha Movie...

Last update: 2015/09/29 15:50UT

esa space situational awareness

Federated tool from the Seibersdorf Laboratories

AVIDOS 2.0

Science

FAQ

Contact

Feedback

Disclaimer

Acknowledgements

GCR Total effective dose 67 μ Sv

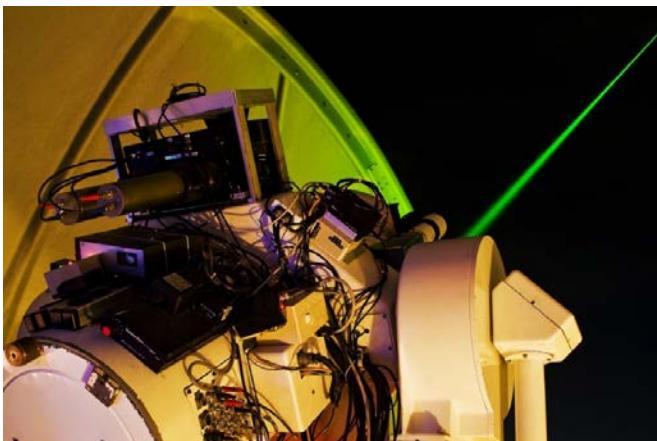
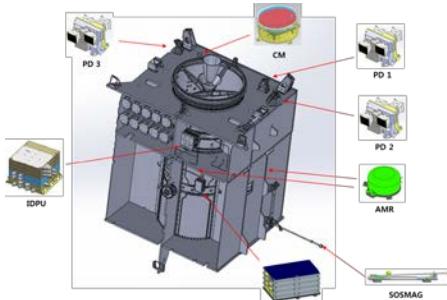
SCR Total effective dose 261 μ Sv

GCR + SCR Total effective dose 328 μ Sv

Download

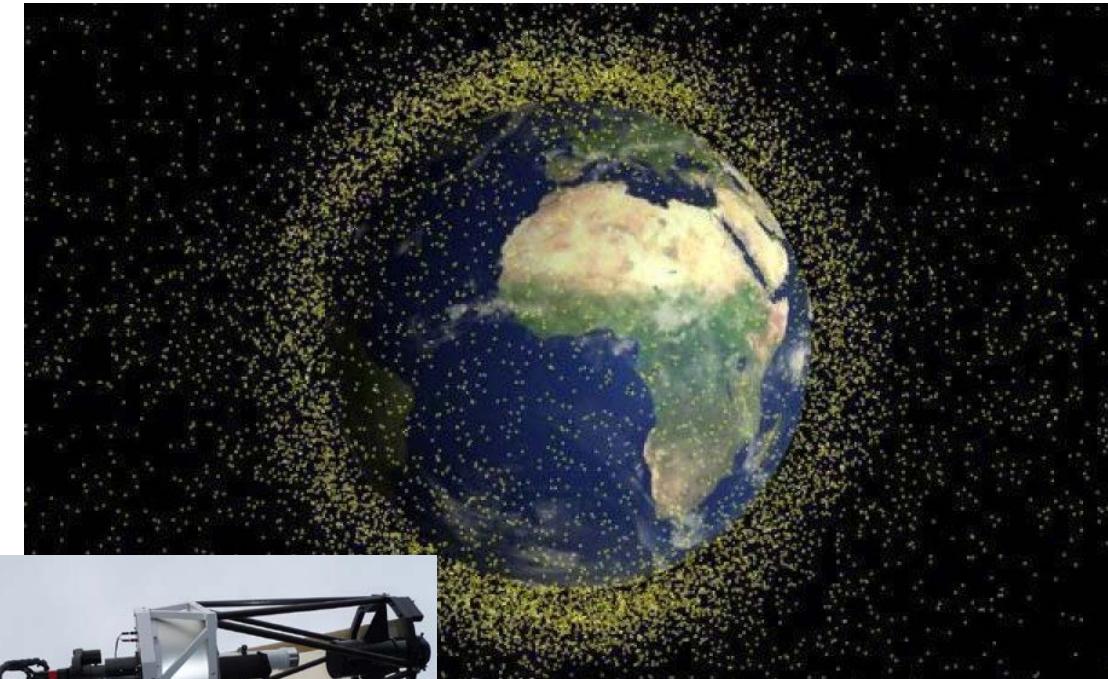
Calculate

The screenshot shows a world map with several green elliptical orbits representing satellite trajectories. Overlaid on the map are various labels indicating current dose rates: "Current dose rate of 1e-10.671 s" at the top, followed by "4.9 pRads" repeated four times, "3.9 uRads" repeated three times, "2.9 uRads" twice, and "0.2 uRads" once. The map also features a color-coded legend for "Dose Rate" with levels from "Low" (light blue) to "Very High" (red). On the left side, there's a sidebar with links for "About SSW", "SSA Space Weather Activities", "User Domains", "Current Space Weather", "Contact", "Expert Service Centres" (with Solar Weather, Space Radiation, Ionospheric Weather, Geomagnetic Conditions), "SSW Applications" (with SWINET, SPENVIS, SEISOP, SEDAT, IONMON, EDDI), and "Other Resources" (with DOCUMENTS, SWWT, SWEN NEWSLETTER, UPCOMING EVENTS, and Sign In/Register).

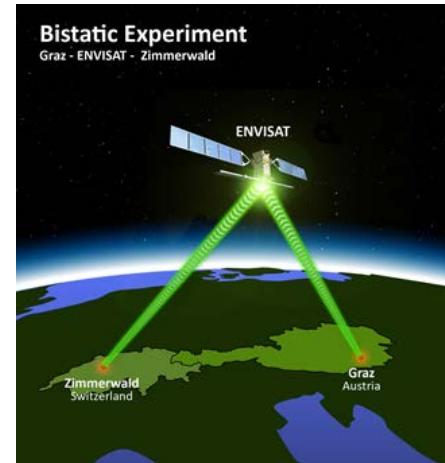


Austria contributes to **Expert Service Centres** within ESA's SSA Programme

Austria plays an active role!

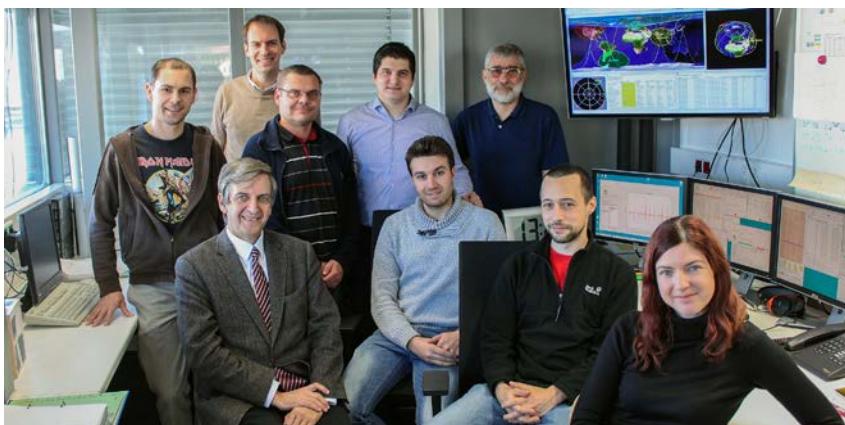
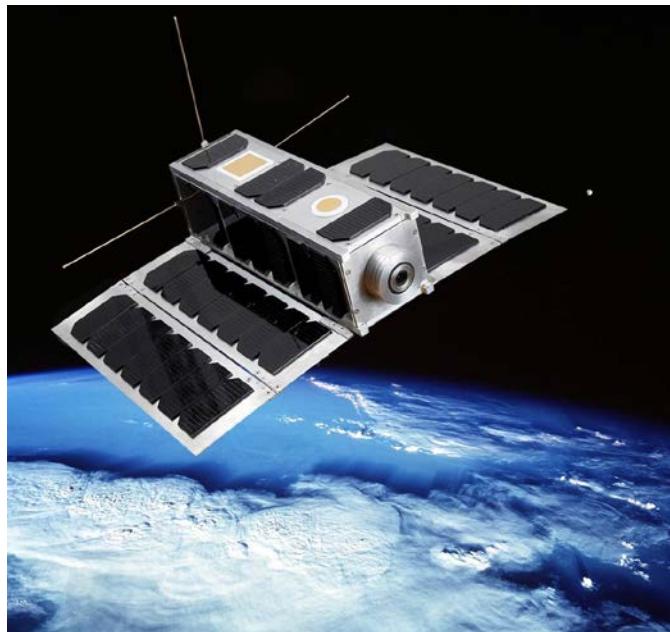
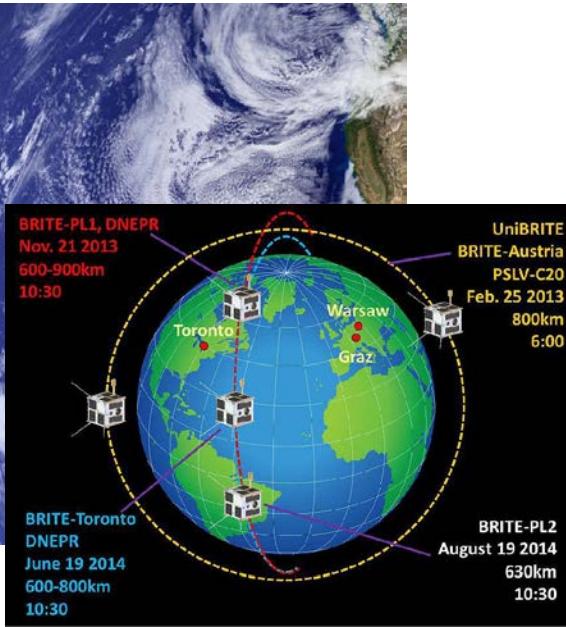


Satellite Laser Ranging for Space Debris Monitoring

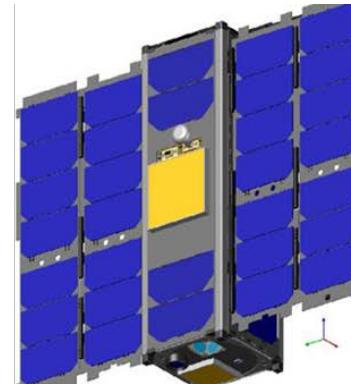
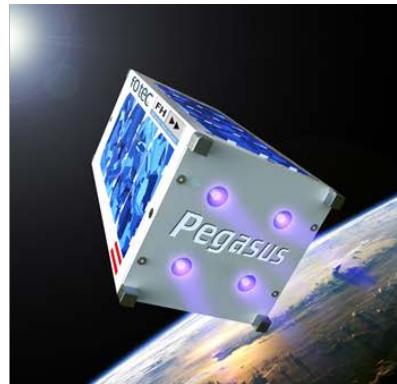


CubeSats made in Austria

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

Space Education



The screenshot shows the homepage of the European Space Education Resource Office (ESERO) Austria. The header includes the logo 'esero' with 'Austria' above it, and the text 'EUROPEAN SPACE EDUCATION RESOURCE OFFICE A collaboration between ESA & national partners'. Below the header is a navigation menu with links: NEWS, ÜBER UNS, LEHRERINNENFORTBILDUNG, UNTERRICHTSMATERIALIEN, PROJEKTE, PARTNER, KONTAKT, EN, and DE.

News



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

Im Januar 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!

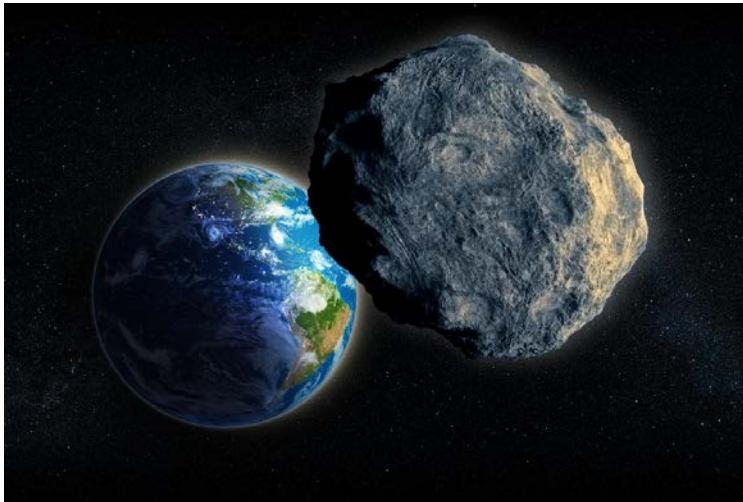
Mission X – Train Like an Astronaut ist ein internationales Wettbewerb für Schüler, der 2017/18 zum achten Mal weltweit durchgeführt wird. Die amerikanische und europäische Weltraumorganisationen NASA und ESA haben für Mission X eine Reihe von Übungen entwickelt, die Kindern viel Spaß an Weltraumwissen, 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



UNOOSA and ESPI



[About Us](#) [Publications](#) [Events](#) [Hosted Activities](#) [Services](#) [Videos](#)



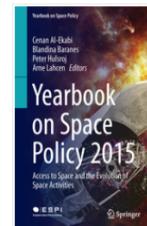
NEWS

[ESPI BRIEF 19. REIGNITING EUROPE'S LEADERSHIP IN DEBRIS MITIGATION EFFORTS](#)

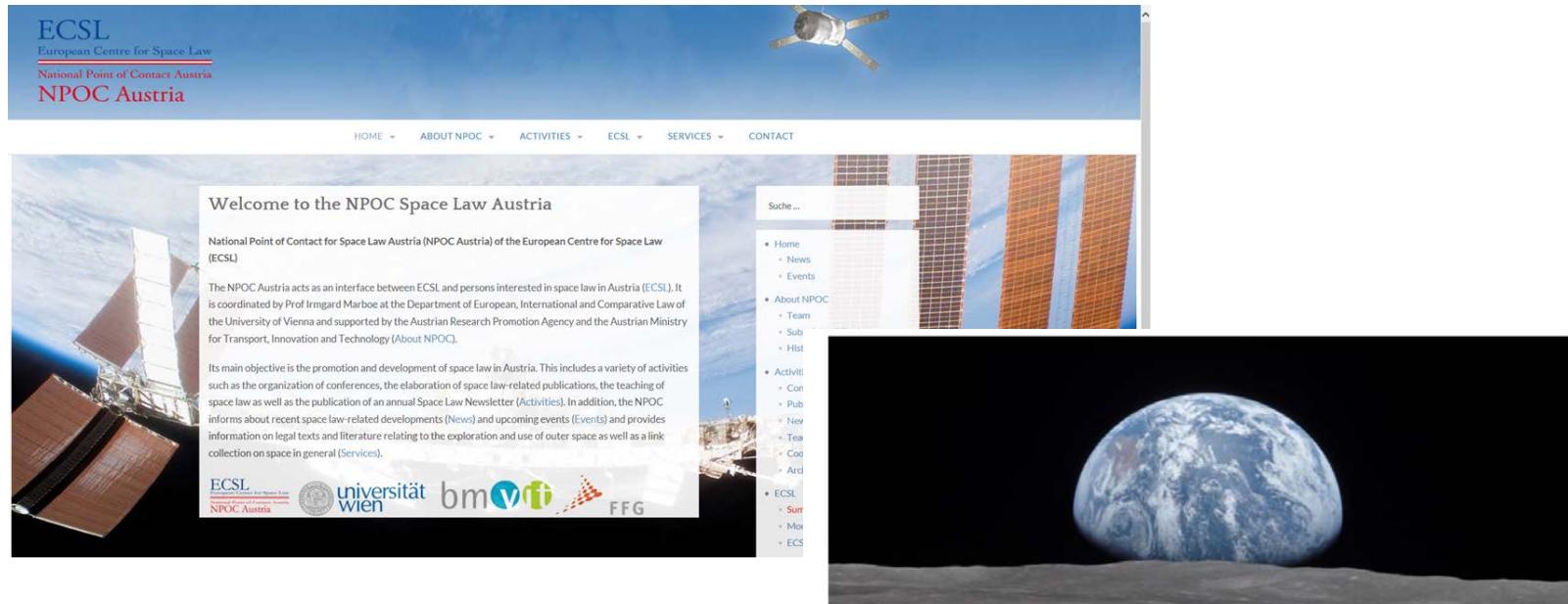
12 January 2018. In the past decade, the count of trackable debris fragments has more than doubled, driven by collisions in space, several high-profile ASAT tests, the proliferation of cubesats and growing number of upper stages left in orbit. Additional European leadership will be needed to fully respond 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](#)



Space Law National Point of Contact Austria



ECSL
European Centre for Space Law
National Point of Contact Austria
NPOC Austria

HOME ABOUT NPOC ACTIVITIES ECSL SERVICES CONTACT

Welcome to the NPOC Space Law Austria

National Point of Contact for Space Law Austria (NPOC Austria) of the European Centre for Space Law (ECSL)

The NPOC Austria acts as an interface between ECSL and persons interested in space law in Austria (ECSL). It is coordinated by Prof Irmgard Marboe at the Department of European, International and Comparative Law of the University of Vienna and supported by the Austrian Research Promotion Agency and the Austrian Ministry for Transport, Innovation and Technology (About NPOC).

Its main objective is the promotion and development of space law in Austria. This includes a variety of activities such as the organization of conferences, the elaboration of space law-related publications, the teaching of space law as well as the publication of an annual Space Law Newsletter (Activities). In addition, the NPOC informs about recent space law-related developments (News) and upcoming events (Events) and provides information on legal texts and literature relating to the exploration and use of outer space as well as a link collection on space in general (Services).

ECSL Universität wien bm^{vfti} FFG

Suche ...

- Home
 - News
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- About NPOC
 - Team
 - Sub
 - Hist
- Activiti
 - Con
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 - New
 - Tea
 - Coo
 - Ard
- ECSL
 - Sur
 - Mon
 - ECS



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!