



COSMOS2020 NEWSLETTER #28

16 May 2017



Research & Innovation – Shaping our Future

Brussels, 3rd June 2017

The conference Research & Innovation – Shaping our Future, hosted by Research, Science and Innovation Commissioner Carlos Moedas, will bring together policymakers from EU institutions, nearly 500 stakeholders and interested actors to discuss the role of research and innovation for Europe's future.

Pascal Lamy, the chair of the High Level Group on maximising the impact of European research and innovation programmes, will present the Group's vision and recommendations for the future, based on the results of the interim evaluation of Horizon 2020. Visionary speakers will include captains of industry, researchers and innovators at the frontier of progress, politicians and movers and shakers in society but also young people who have expectations for the(ir) future. They will discuss with the audience how research and innovation could transform our economy and improve our society.

[Read more and register here!](#)



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UK Space Conference

Manchester Central Convention Complex, 30th May 2017

Held every two years, the UK Space Conference is the unmissable forum for the UK and international space community and a must attend event for organisations eager to expand into this growing sector.

As the unrivalled networking platform, this is the key opportunity to establish new contacts, exchange information and improve your links with government, industry, academia, customers, suppliers, education providers, researchers and the financial community.

The two and a half day programme will present a compelling forum to discuss the changing political, economic and technological landscape impacting the UK space industry. It will review the UK's strategy to capture a 10 per cent share of the global space market, which is forecast to be worth at least £400bn by 2030.

Building on the success of the 2015 conference, which attracted over 1,000 delegates and more than 100 exhibitors, the UK Space Conference 2017 will be even bigger and better.

[Read more about the 2017 Objectives!](#)



Galileo Hackathon

Gdańsk, Poland, 15-17th May 2017

Show your coding skills at the second Galileo hackathon!

Galileo, the European Global Navigation Satellite System is now operational and is starting to deliver live services to the Geo-IoT community.

We are looking for passionate coders who want to shape the future of Location-Based Services (LBS) and Geo-IoT. Become a pioneer developer and discover how Galileo satellites can help transform ideas into reality!

Join our two-day Galileo Hackathon, showcase your skills, connect with the Geo-IoT app-dev community, gain a competitive advantage for your future projects and win great prizes for you and your team.

[Read more and register for the second Galileo Hackathon here!](#)



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New funding opportunities for GNSS chipsets, receivers and antennas manufacturers

Four funding opportunities currently open within the [Fundamental Elements](#): a research and development funding mechanism to development of GNSS chipsets, receivers and antennas building on Galileo and EGNOS differentiators.

In 2015, the European GNSS Agency (GSA) launched Fundamental Elements, a research and development (R&D) funding mechanism supporting the development of innovative GNSS chipsets, receivers and antennas technology building on Galileo and EGNOS differentiators.

To accelerate the integration of [Galileo](#) and [EGNOS](#) into market-ready devices, in February 2017 GSA has launched four new funding opportunities across all market segments:

Road, Smart Tachograph

[-OS-NMA user terminals for the road segment](#) (Deadline: 29 May 2017)

Aviation

[Advanced RAIM Multi-constellation Receiver](#) (Deadline: 19 May 2017)

Maritime

[-SBAS-enabled shipborne receivers](#) (Deadline: 31 May 2017)

Search and rescue

[-MEOSAR beacons for search-and-rescue-related applications](#) (Deadline: 31 May 2017)

[Read more!](#)



ESA identifies new science ideas for future space missions

Last year, ESA called on the scientific community to propose new and innovative science ideas that could be relevant for future space missions within the Science Programme. From the proposals that were received three key areas of interest have been selected for further investigation.



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The [call for ideas](#) was issued on 6 February 2016. The purpose of the call was to drive innovation by stimulating new ideas possibly based on technologies that are not yet sufficiently mature.

In total, 26 proposals were received, addressing a variety of science topics. These were assessed under the responsibility of ESA's Science Advisory Structure, and three key themes of potential interest and impact were identified:

- **Quantum physics**, with a focus on the boundaries of and relationship between quantum and classical physics, in particular investigating the aspect known as quantum decoherence.
- **Planetary science**, with a focus on small-platform missions to rocky planets and small bodies, which could enable new opportunities for scientific research.
- **High-accuracy astrometry**, with a focus on compiling a global, near-infrared view of the Milky Way. By observing in the infrared, reddening effects (caused by starlight scattering off intervening material in our galaxy) would be reduced, allowing scientists a clear view of our galaxy's central bulge, core, and 'hidden' regions.

In each case, ESA will soon begin discussions with the relevant science communities to develop and refine the requirements and objectives for possible mission scenarios. This will be followed by preliminary technical studies to better understand the feasibility of these scenarios. The results of these studies, which will be made available to the scientific community, could be used in future mission proposals for the Science Programme.

[Read more!](#)



Call for a Sustainable future in Space

With more than 750 000 pieces of dangerous debris now orbiting Earth, the urgent need for coordinated international action to ensure the long-term sustainability of spaceflight is a major finding from Europe's largest-ever conference on space debris.

"We require a coordinated global solution to what is, after all, a global problem that affects critical satellites delivering services to all of us," said Brigitte Zypries, German Federal Minister for Economic Affairs and Energy, at a press briefing on the conference's closing day in Darmstadt, Germany.

ESA Director General Jan Woerner appealed to space stakeholders to keep Earth's orbital environment as clean as possible. Developing and implementing the ESA Space Situational Awareness ([SSA](#)) programme as decided during ESA's last ministerial council in 2016 will be a key factor.

"In order to enable innovative services for citizens and future developments in space, we must cooperate now to guarantee economically vital spaceflight. We must sustain the dream of future exploration," he said.

The call for international action came on the final day of the European Conference on Space Debris, a gathering of over 350 participants from science, academia, industry and space agencies worldwide held at ESA's mission control centre, where the ESA Space Debris Office and the SSA effort are based.



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Since 1957, more than 5250 launches have led to a population today of more than 23 000 tracked debris objects in orbit. Only about 1200 are working satellites – the rest are debris and no longer serve any useful purpose. Many derelict craft have exploded or broken up, generating an estimated 750 000 pieces larger than 1 cm and a staggering 166 million larger than 1 mm. “In orbit, these objects have tremendous relative velocities, faster than a bullet, and can damage or destroy functioning space infrastructure, like economically vital telecom, weather, navigation, broadcast and climate-monitoring satellites,” said Dr Krag, head of ESA’s debris office.

[Read more!](#)



Training materials from ESA

ESA provides a wide range of training materials for different subject areas. A list of resources of interest to SMEs is provided below:

ECSS

The European Cooperation for Space Standardization (ECSS) is an initiative established to develop a coherent, single set of user-friendly standards for use in all European space activities. To train potential users in applying ECSS standards in space projects, or tailor these standards for their specific needs, ESA’s Requirements and Standards division has prepared a wide range of training materials, covering topics such as “System Engineering Standards”, “Space Engineering Mechanisms”, “Quality Assurance” and many more. The materials can be [accessed here](#).

ECSS self-training presentations with audio such as “An introduction into the ECSS standardization system and its implementation in the ECSS member's programmes” can be [downloaded here](#). A replay of ESA's training on ECSS standards live streamed on 14-16 March 2017, can be accessed [here](#).

Visit the [ESA training calendar for ECSS training](#) to find out about forthcoming training sessions. Participation can be requested via the respective National Space Authority or Office.

Doing Business with ESA

To learn more about ESA’s Invitation To Tender (ITT) process, about the writing of a successful proposal and its financial part, visit: http://www.esa.int/About_Us/Business_with_ESA/How_to_do

The ESA Procurement Process

The ESA Procurement Process is described in detail at:
http://www.esa.int/About_Us/Business_with_ESA/How_to_do/The_ESA_Procurement_Process

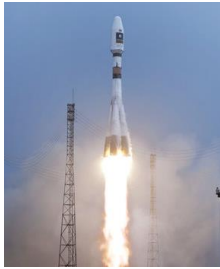
Intellectual Property Rights (IPR)

A short introductory video about ESA Industry and Intellectual Property Rights is [available here](#).

[..and many more!](#)



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Exoplanet mission gets ticket to ride!

A Soyuz rocket operated by Arianespace from Europe's spaceport in Kourou will boost ESA's upcoming exoplanet satellite into space.

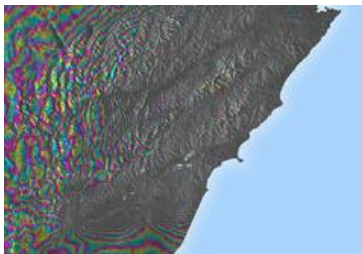
Cheops– the CHAracterising ExOPlanet Satellite – will share the ride into space with another payload, with the two separating in turn into their own orbits soon after ascent. Arianespace has confirmed it will provide the launch services, with the contract to be signed by ESA in the coming weeks.

While the exact launch date remains to be confirmed, Cheops is expected to be ready by the end of 2018 for shipping to Kourou, with all testing completed. Once in space, Cheops will target nearby, bright stars already known to have orbiting planets.

Through high-precision monitoring of a star's brightness, scientists will examine the [transit of a planet](#) as it passes briefly across the star's face. This allows the radius of the planet to be accurately measured. For those planets of known mass, the density will be revealed, providing an indication of the structure.

These key features will help us to understand the formation of planets in the Earth-to-Neptune mass range. The mission will also contribute to ideas about how planets change orbits during their formation and evolution. Cheops will also identify targets for habitability studies using future ground- and space-based telescopes, including the international James Webb Space Telescope being launched next year.

[Read more!](#)



Satellites shed new light on Earthquakes

Satellite radar scans of last year's earthquake in New Zealand are changing the way we are thinking about earthquake hazards in regions where our planet's tectonic plates meet.

The 7.8-magnitude quake that struck New Zealand's South Island near the town of Kaikoura on 14 November was one of the most comprehensively recorded earthquakes in history. Immediately after it, a team of scientists from New Zealand, the UK and the US began to study radar images from the Copernicus Sentinel-1 and Japanese ALOS-2 missions to measure the extent of the land movement. They found that the quake caused the ground to rise by 8–10 m and offset features like roads that crossed the fault by up to 12 m. This caused large landslides and triggered a tsunami.



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Satellite radar scans from before and after the quake showed that the ground-based seismic readings were not giving accurate assessments of where the ruptures were occurring. Seismic readings are based on the shockwaves rippling through Earth. Although they are the quickest way to gather information on earthquakes, they are unable to show details in complex quakes like Kaikoura.

But radar satellites like Sentinel-1 can detect movements of millimetres in the ground and across wide areas, providing a detailed picture of land deformation and the locations of fault lines. In the case of Kaikoura, it showed the research team that ruptures took place across many separate faults. They saw that the complexity and large amount of uplift point towards how mountains in regions such as New Zealand could build rapidly.

“We’ve never seen anything like the Kaikoura quake before – it was one of the most complex ever recorded,” said Professor Tim Wright, study co-author and director of the Centre for the Observation and Modelling of Earthquakes, Volcanoes and Tectonics at the UK’s University of Leeds. “An earthquake commonly ruptures across a single fault line or faults that are closely grouped, but Kaikoura ruptured at least 12 major crustal faults across two distinct active fault domains. “This challenges many assumptions about how individual faults control earthquake ruptures.”

The [study published in Science](#) has prompted scientists to reassess how many different faults can be involved in a single earthquake, and could potentially help to re-evaluate seismic hazard models.

[Read more!](#)

