



COSMOS2020 NEWSLETTER #27

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ESNC 2017 is looking for innovative satellite navigation applications

The new round of the [European Satellite Navigation Competition \(ESNC\)](#) finally started! Renowned partners, an impressive and unparalleled prize pool worth more than EUR 1 million and the very first E-GNSS Accelerator promise to make this year's edition truly outstanding.

Ever since 2004, the ESNC has evolved into the **leading innovation network for satellite navigation**. The international competition annually awards the best services, products, and business ideas using satellite navigation in everyday life. Its mission is to spur the development of market-driven applications based on satellite navigation technologies. The competition proves that satellite navigation technologies open the door to myriad applications. Over the past 13 years, the ESNC has already selected more than **270 winners** from among more than **11,000 participants from more than 80 countries worldwide**. Many of these **cutting-edge business ideas** have already been implemented and successfully launched into the market!

International Premium Partners

As an integral part of the European space community, the competition showcases new ideas and pioneering trends. It supports participants in turning their applications and business models into reality. By joining, participants easily get access to AZO's international innovation network which helps them to boost their idea to the next level. **Over 160 space-related partners** from politics, research and industry ensure that participants find the right contact corresponding to their different needs and backgrounds. In addition to [six Special Prize Challenges](#) with renowned partners like the European GNSS Agency (GSA), the European Space Agency (ESA), the German Aerospace Center (DLR), the German Federal Ministry of Transport and Digital Infrastructure (BMVI), as well as our current [17 Regional Challenges](#) guarantee a broad geographic coverage. Prototypes can also be entered into the GNSS Living Lab Challenge. The University Challenge, meanwhile, is explicitly designed for students and research associates.



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Impressing Prizes and the First E-GNSS Accelerator

[The 2017 prize pool](#) is worth more than **EUR 1 Mio** and includes **cash prizes** as well as valuable **in-kind support**. Furthermore, winners and finalists get access to our international network and benefit from the first **E-GNSS Accelerator**. This new initiative by the European Commission enriches our prize pool even more: the **best startups will be supported to move beyond idea conception into incubation** and development phases of true commercial ventures!

SMEs, startups, entrepreneurs, students and all individuals with a future-oriented idea are welcome to join and submit their entries from 1 April to 30 June 2017 at: www.esnc.eu

Connect with them on [Facebook](#) and [Twitter](#)!

Find also the [Poster](#) and the [Press Release](#)!



RADECS 2017
CERN, Geneva

RADECS 2017

Geneve, Switzerland, 2-6th October 2017

The RADECS Conference, held on alternate years, is the major European rendez-vous for the radiation effects community. Both the RADECS Conference and Workshop address technical issues related to radiation effects on devices, integrated circuits, sensors, and systems, as well as radiation hardening, testing, and environmental modeling methods. These fields are of importance in space, nuclear power, atmospheric, ground, military, high energy physics applications.

The aim of RADECS conferences is to provide an annual European forum for the presentation and discussion of the latest advances in the field of radiation effects on electronic and photonic materials, devices, circuits, sensors, and systems. The scope of the conference encompasses technological processes and design techniques for producing radiation tolerant systems for space, aeronautical or terrestrial applications, as well as relevant methodologies for their characterization and qualification.

The conference features a technical program, an Industrial Exhibit, and one day tutorial or 'short course' on radiation effects. The technical program includes oral and poster sessions and round tables.

Conference Targets

- Strong technical program** with a view on synergies between space, accelerator, ground and aviation related applications
- Short-Course:** "From Space to Ground – and Below"
- Support for students** coming to Geneva
- Make people **enjoy the Geneva area** and discover its treasures

[Read more and sign in!](#)



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ESCC (European Space Components Coordination) Training Course

Keplerlaan 1, 2200AG Noordwijk ZH, the Netherlands, 10th May 2017

The agenda of the course will cover the scope of the ESCC activities, including the ESCC specification system and the ESCC component qualification and manufacturers' certification processes.

In particular the course will address the following topics:

- What is ESCC and how is it related to the space industry in Europe?
 - The ESCC organization (the roles that national space agencies, European space industry and component manufacturers play)
 - The Governance of ESCC (policy, strategy, implementation processes)
 - The ESCC specification system. Its core specifications and its areas of growth.
- ESCC Evaluation and Qualification in detail.
 - The access to ESCC qualification
 - Latest developments: ESCC Process Capability Approval
- Quality Assurance in ESCC

COURSE DETAILS:

-Time: 10th of May 2017, 09:30AM-16:30PM

-Venue: ESA ESTEC, meeting room, "ESCAPE Dance Room"

[Register here!](#)



MPTB (European Materials & Processes Technology Board) one-day workshop

Keplerlaan 1, 2200AG Noordwijk ZH, the Netherlands, 16th May 2017

On 16 May, the European Materials & Processes Technology Board (MPTB) is holding a one-day workshop at ESTEC, ESA's technical centre in Noordwijk, the Netherlands. Small companies, SMEs, and academia involved in hardware manufacturing for space programmes are invited to learn more about how their supply chain can be affected by obsolescence of chemicals or technologies.

Registration, Evaluation, Authorisation and Restriction of Chemicals, REACH, is a strict law controlling chemical substances. It contributes to a safer and healthier environment, but poses wide-reaching engineering challenges for the space sector which is by nature driven by performance and heritage design.

The complexity of the issue and its possible industrial impact requires European-wide coordination among space industry and agencies. This is achieved through the MPTB. This body comprises large system integrators, equipment manufacturers, expert companies, national space agencies and ESA.

This event aims to raise awareness of issues associated with REACH, offer support from the MPTB, and encourage dialogue via a round table discussion.

Participation is free of charge.

[Read more and register here!](#)



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Surviving the long dark night of the Moon

Designers of future Moon missions and bases have to contend with a chilling challenge: how might their creations endure the fortnight-long lunar night? ESA has arrived at a low-cost way of surviving.

During prolonged night, when the surface is lit only by blue Earthlight, temperatures dip below -170°C . Some locations at higher latitudes have shorter nights, though others have much longer or even permanent darkness.

Numerous robotic missions have perished during this prolonged cold. Russia's Lunokhod-2 rover, for instance, failed to make it through the night in May 1973, its radioactive heater having gradually run down after four months of exploring.

The Apollo manned missions stayed on the surface only a few days at a time, and all during the early lunar morning. But future lunar settlers will have to live in the night as well as the day, bearing in mind that vital solar energy and heat would be unavailable during the 14 days of darkness.

"Up until now, radioactive heat and power sources have been the preferred solution for lunar habitats," explains ESA's Moritz Fontaine. "But these would multiply the cost and complexity of any expedition. "So we're exploring a more sustainable solution, using the capacity of moon dust to absorb and store energy when hit by sunlight, then releasing this energy during the lunar night."

[Read more!](#)



Unravelling Earth's magnetic field

ESA's Swarm satellites are seeing fine details in one of the most difficult layers of Earth's magnetic field to unpick – as well as our planet's magnetic history imprinted on Earth's crust.

Earth's magnetic field can be thought of as a huge cocoon, protecting us from cosmic radiation and charged particles that bombard our planet in solar wind. Without it, life as we know it would not exist. Most of the field is generated at depths greater than 3000 km by the movement of molten iron in the outer core. The remaining 6% is partly due to electrical currents in space surrounding Earth, and partly due to magnetised rocks in the upper lithosphere – the rigid outer part of Earth, consisting of the crust and upper mantle.

Although this 'lithospheric magnetic field' is very weak and therefore difficult to detect from space, the Swarm trio is able to map its magnetic signals. After three years of collecting data, the highest resolution map of this field from space to date has been released.



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“By combining Swarm measurements with historical data from the German CHAMP satellite, and using a new modelling technique, it was possible to extract the tiny magnetic signals of crustal magnetisation,” explained Nils Olsen from the Technical University of Denmark, one of the scientists behind the new map.

Presented at this week’s Swarm Science Meeting in Canada, the new map shows detailed variations in this field more precisely than previous satellite-based reconstructions, caused by geological structures in Earth’s crust.

One of these anomalies occurs in Central African Republic, centred around the city of Bangui, where the magnetic field is significantly sharper and stronger. The cause for this anomaly is still unknown, but some scientists speculate that it may be the result of a meteorite impact more than 540 million years ago.

The magnetic field is in a permanent state of flux. Magnetic north wanders, and every few hundred thousand years the polarity flips so that a compass would point south instead of north. When new crust is generated through volcanic activity, mainly along the ocean floor, iron-rich minerals in the solidifying magma are oriented towards magnetic north, thus capturing a ‘snapshot’ of the magnetic field in the state it was in when the rocks cooled. Since magnetic poles flip back and forth over time, the solidified minerals form ‘stripes’ on the seafloor and provide a record of Earth’s magnetic history.

The latest map from Swarm gives us an unprecedented global view of the magnetic stripes associated with plate tectonics reflected in the mid-oceanic ridges in the oceans. “These magnetic stripes are evidence of pole reversals and analysing the magnetic imprints of the ocean floor allows the reconstruction of past core field changes. They also help to investigate tectonic plate motions,” said Dhananjay Ravat from the University of Kentucky in the USA. “The new map defines magnetic field features down to about 250 km and will help investigate geology and temperatures in Earth’s lithosphere.”

[Read more!](#)

