Second-generation Galileo Contract Awarded to Thales

The European Space Agency (ESA) has selected Thales Alenia Space to support the implementation and experimentation of the navigation algorithms that will be used in the Galileo Second Generation program. Under the contract, Thales will develop the Advanced Orbit Determination and Time Synchronisation (ODTS) Algorithms Test Platform (A-OATP).

Thales Alenia Space, a joint venture between Thales (67%) and Leonardo (33%), is the prime contractor for Galileo First Generation's Ground Mission Segment. ESA granted the contract on behalf of the European Commission in the Horizon 2020 Satellite Navigation Program (HSNAV). In a previous contract, Thales Alenia Space was chosen to provide six satellites and initiate the B2 phase of development and implementation of its ground segment for the Galileo Second Generation constellation.

Read more in *GPS World* article. https://www.gpsworld.com/second-generation-galileo-contract-awarded-to-thales/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210414002&oly_enc_id=1784A2382467C6V

2021-04-19

Prince Philip Championed GPS as Master of Trinity House

Prince Philip, technology advocate, championed both GPS and alternative navigation methods during his lifetime. Prince Philip — the Duke of Edinburgh and husband of Queen Elizabeth II of the United Kingdom — died on April 9 at Windsor Castle in England. He was 99. His funeral took place on April 17.

As the Master of Trinity House, Prince Philip was the U.K.'s authority for lighthouses in England, Wales, the Channel Islands and Gibraltar. Trinity House is also responsible for the provision and maintenance of other navigational aids, such as light vessels, buoys and maritime radio/satellite communication systems.

Read more in *GPS World* article. https://www.gpsworld.com/prince-philip-championed-gps-as-master-of-trinity-house/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210414002&oly_enc_id=1784A2382467C6V

2021-04-15

Russia Ramps Up GPS Jamming Along With Troops at Ukraine Border

Two recent reports from the Organization for Security and Co-operation in Europe (OSCE) have described a recent increase in GPS jamming, presumably by Russian or pro-Russian forces in Ukraine. This comes as Russia has increased its troop numbers and activity along its border with Ukraine.

OSCE is charged with a Special Monitoring Mission (SMM) in Ukraine which observes and reports on how well both sides are adhering to the Minsk Protocol agreement. The agreement was signed in September 2014 by participants in the conflict in an effort to end open hostilities.

One of the ways the OSCE mission monitors activity and compliance in the region is with long range UAVs. As early as November 2014, the organisation reported UAV operations being thwarted by interference with GPS signals.

An April 7 report described interference that prevented a UAV takeoff the previous day. While the organisation's UAVs had been experiencing increased interference since March, this was the first time since October 2014 that it had thwarted a mission before takeoff

Read more in *GPS World* article. https://www.gpsworld.com/russia-ramps-up-gps-jamming-along-with-troops-at-ukraine-border/

2021-04-21

Positioning Australia Seeks Industry Input

Positioning Australia wants to hear from users of precise positioning services to help it develop the standards and protocols needed to meet industry requirements. In December the agency released an online questionnaire that gives members of the geospatial sector the opportunity to provide feedback on how they use positioning in their daily work, and what they would like to see in future.

The questionnaire is still open, and all users of precise positioning services are encouraged to take part. According to Positioning Australia, the goal is to "increase industry and community uptake of positioning technology, and ultimately improve how location information is used in Australian business operations".

Read more in *Spatial Source* article. https://www.spatialsource.com.au/latest-news/positioning-australia-seeks-industry-input?utm_medium=email&utm_campaign=SS%20Newsletter%2014042021&utm_content=SS%20Newsletter%2014042021+CID_3b4669ac3ccd134702aa0afa1bb1c05b&utm_source=Campaign%20Monitor&utm_term=Positioning%20Australia%20seeks%20industry%20input

2021-04-08

Next Steps in GNSS Receiver Security Validated with OSNMA Testing

At least three commercial organisations have initiated testing of the Galileo Open Service Navigation Message Authentication (OSNMA) service, concurrently with the European GNSS Agency (GSA) and the European Space Agency (ESA) themselves. Results to date show success. OSNMA offers end-to-end authentication on a civilian signal, protecting receivers from spoofing attacks. OSNMA is pioneered by the Galileo Program.

Galileo OSNMA is an authentication mechanism that allows GNSS receivers to verify the authenticity of the information transmitted by the satellite itself making sure that the data they receive are indeed from Galileo and have not been modified in any way. OSNMA is a novel and unique service provided free-of-charge to all users, contributing to increase the overall security of GNSS-based applications and services.

Read more in *Inside GNSS* article. https://insidegnss.com/next-steps-in-gnss-receiver-security-validated-with-osnma-testing/

2021-03-31

5G Positioning Reaches 3 Metres Inside China Subway Station

China Mobile Suzhou and Huawei have verified 5G indoor positioning capability in metro transport scenarios in Suzhou, China. The verification showed that, even with Pico Remote Radio Units (pRRUs) hidden, a positioning precision of 3 to 5 m can be achieved in 90% of the platform and hall areas. Verificiation of 5G indoor positioning on live networks in the world, provides valuable experience for the commercial growth of 5G positioning in vertical industries.

Indoor location-based services are in high demand for vertical applications, such as indoor navigation, asset tracking, geofencing, logistics management, and personnel management, which reflects the huge market space of indoor positioning. Currently, indoor positioning technologies are of great variety and most of them need to be deployed and maintained individually, producing high end-to-end costs. As a part of the continuous evolution of 5G, positioning has been added to 3GPP Release 16 finalized in mid 2020 to realise indoor positioning by leveraging the ultra-high signal resolution empowered by 5G's high bandwidth, multi-point measurements, and multi-access edge computing (MEC) deployment.

Read more in *Inside GNSS* article. https://insidegnss.com/186153-2/
2021-04-12

UK Firms to Develop a More Accurate Atomic Clock for GNSS

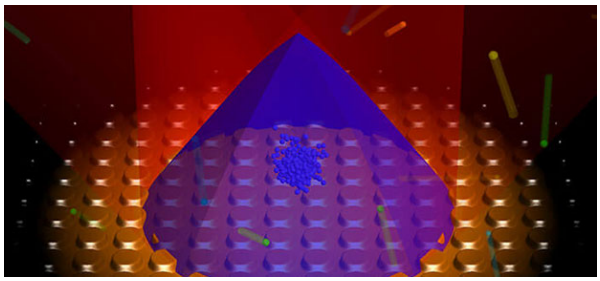
Nanofabrication experts Kelvin Nanotechnology have teamed up with product design specialist Wideblue, the University of Strathclyde and the University of Birmingham on a UK Research and Innovation (UKRI) project funded by the Industrial Strategy Challenge Fund to develop innovative techniques in the miniaturisation of optical atomic clocks. The new clock technology will help improve GNSS location accuracy, as well as addressing the scalability of other quantum technologies being developed by the academic partners.

“Small, low cost atomic clocks will be essential as we develop a resilient position, navigation and timing (PNT) infrastructure to support our financial, power distribution and communications services,” said Roger McKinlay, challenge director – Quantum Technologies at UKRI.

Cold atomic samples have led to profound advancements in precision metrology by measuring the frequency separation of discrete atomic energy levels. These atomic clocks are the ultimate timekeepers, with the state-of-the-art instruments providing a timing accuracy that it would neither gain nor lose a second in over 30 million years.

Read more in *GPS World* article. https://www.gpsworld.com/uk-firms-to-develop-a-more-accurate-atomic-clock-for-gnss/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210331002&oly_enc_id=1784A2382467C6V

2021-04-01



Stone Slab Found in France Thought to be Europe’s Oldest 3D Map

Archaeologists in France have uncovered a stone with 4,000-year-old etchings they believe may be the oldest three-dimensional map in Europe.

The engravings on the broken stone appear to resemble topographical features including hills and a river network.

More modern geolocalisation techniques suggest the 2.2-metre by 1.53-metre stone known as the Saint-Bélec Slab, first discovered in 1900 but then lost, show an area of western Brittany. It is believed to date from the early bronze age between 2150BC and 1600BC.

The slab was first found in 1900 during a dig at a prehistoric burial ground in Finistère by a local archaeologist, Paul du Châtellier, whose collection was bought by the National Antiquities Museum (MAN) in 1924.

Its whereabouts then remained forgotten until 2014 when it was rediscovered in a cellar under a moat at the museum's chateau at Saint-Germain-en-Laye, north west of Paris.

Read more in *article*…

https://www.theguardian.com/world/2021/apr/07/stone-slab-found-france-europe-oldest-3d-map-saint-belec-slab

2021-04-08

Galileo Satellite Performs Collision Avoidance Maneuvre

In a first for Galileo, a satellite performed a collision-avoidance maneuvre to avoid space debris. Under the management of the European GNSS Agency (GSA), the maneuvre for satellite GSAT0219 was performed March 6 following a collision risk alert received from EU Space Surveillance and Tracking (EUSST).

On Feb. 25, the Galileo Service Operator (GSOp) received from EUSST a collision risk alert between GSAT0219 and an inert Ariane 4 upper stage launched in 1989. Following the warning, GSOp closely monitored the risk, in close cooperation with EUSST that was refining its predictions.

Following refinement of the Ariane 4 orbit, the risk of collision was still unacceptably high. After assessment of different strategies and associated risks on the service provision, the GSA authorized the execution of an avoidance maneuvre. The satellite was taken out of service on March 5, and users were informed via NAGU #2021009. The collision avoidance maneuvre was performed shortly thereafter, by temporarily relocating the satellite away from its nominal position.

Read more in *GPS World* article. https://www.gpsworld.com/galileo-satellite-performs-collision-avoidance-maneuver/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210324003&oly_enc_id=1784A2382467C6V

2021-03-25

ESA, NASA Race to the Moon for First Lunar GNSS Fix

An experimental European Space Agency (ESA) moon-bound payload will carry an advanced GNSS receiver to perform what may be the first satnav positioning fix in lunar orbit. ESA's Lunar Pathfinder mission, a public-private partnership due to launch by the end of 2023, will take an early step in an ESA plan to expand reliable satnav coverage and communication links to explorers around, and ultimately upon the surface of, the moon during this decade.

An overview of previous, current and future PNT projects concerning the moon was given in two recent *Inside GNSS* Working Papers columns, Across the Lunar Landscape – Exploration with GNSS Technology (Sept/Oct 2020) and Across the Lunar Landscape: Towards a Dedicated Lunar PNT System(Nov/Dec 2020). More recently, a news story chronicled a joint initiative by NASA and the Italian Space Agency: Lunar GNSS Receiver Experiment (LUGRE) to Deliver First GNSS Fix from

the Moon in 2023. NASA selected Spirent Federal Systems to test the GNSS receivers intended for deployment in the upcoming lunar exploration. Finally, the Institute of Navigation recognised a team of NASA engineers with the Samuel M. Burka award, for a conference paper on NASA's GPS Antenna Characterization Experiment (GPS ACE).

Clearly, a second race to the moon is on.

Read more in *Inside GNSS* article. https://insidegnss.com/esa-nasa-race-to-the-moon-for-first-lunar-gnss-fix/

2021-03-26