

## Precise Point Positioning in Urban Environments

Precise positioning for mass-market applications faces several challenges. Among them, only low-cost GNSS receivers in the form of small size modules and chips are widely employed in those applications. These suffer large noise levels in pseudorange and more frequent cycle slips in carrier-phase observations, compared to high-end GNSS receivers. Additionally, mass-market applications are often conducted in challenging signal environments with severe navigation signal blockage and attenuation. Finally, current precise point positioning (PPP) algorithms are designed mainly for high-end GNSS receivers.

PPP requires state space representation (SSR) corrections to mitigate satellite orbit, clock and other sources of errors and effects in GNSS measurements. These SSR corrections are freely available from many scientific organizations such as the International GNSS Service (IGS) and from commercial suppliers, such as RTX from Trimble and TerraStar-X from Hexagon, via satellite link or Internet connection. Driven by emerging mass-market applications that demand precise location information, new correction services are being developed such as the TruePoint.io GNSS assistance data from RX Networks, the Skylark correction service from Swift and the SAPA correction service from Sapcorda. Although high accuracy has been widely demonstrated with PPP techniques, it is still largely limited to applications in open environments and using high-end GNSS receivers.

Read more in *Inside GNSS* article. <https://insidegnss.com/precise-point-positioning-in-urban-environments/>

2022-03-08



## Taking PNT to the Moon

“We are going back to the moon,” said Javier Ventura-Traveset, Head of the European Space Agency’s Navigation Science Office, “but this time we are going there to stay.”

Ventura is also ESA’s Lunar PNT Coordinator, and this year he had a lot to talk about. In the context of the new race to the Moon, with the number of planned missions growing, accurate and reliable navigation services are going to be extremely valuable and visible.

“This is about making a fundamental change,” Ventura said. “We have more than a hundred moon missions identified, between now and the end of this decade. Probably not all of them will materialize, but certainly a large number of them will, and all of them will require communication and navigation.”

If we don’t do something about it, Ventura said, each of these missions will have to come up with its own communication and navigation solutions. “This is not efficient. We want to create, together with our partners, a dedicated lunar communications and navigation infrastructure, and this can be an opportunity to ignite a large number of services, to contribute to a sustainable Moon economy.”

Read more in *Inside GNSS* article. <https://insidegnss.com/taking-pnt-to-the-moon%EF%BF%BC/>

2022-03-10



## **Finnish Airline Finds GPS Interference Near Russian Border**

Finnair planes flying close to the Russian border near and south of Finland are reporting unusual activity with their GPS receivers in the last few days.

No cause for the abnormalities has been determined, but the vicinity to the Russian border during the Ukraine war seems to indicate intentional interference. In

particular, interference occurs near the Russian province of Kaliningrad situated between Lithuania and Poland, both NATO members.

Traficom, the Finnish Transport and Communications Agency, has received numerous occurrence reports regarding GPS signal interference observed by aircraft. The interference began during the weekend and is still continuing.

Read more in *GPS World* article. [https://www.gpsworld.com/finnish-airline-finds-gps-interference-near-russian-border/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD220309002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/finnish-airline-finds-gps-interference-near-russian-border/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD220309002&oly_enc_id=1784A2382467C6V)

2022-03-10



## **First Transmission of L1C/B by QZS-1R**

The Japanese QZS-1R satellite was launched on Oct. 26, 2021, from the Tanegashima Space Center in Japan. It serves as a replenishment for QZS-1, the first spacecraft of the Japanese Quasi-Zenith Satellite System (QZSS) in orbit since September 2010.

QZS-1R joins the current QZSS constellation of three satellites in inclined geosynchronous orbit (IGSO) and one geostationary satellite. These four Block I satellites transmit the L1C/A signal at 1575.42 MHz.

QZS-1R, as well as future QZSS satellites, are able to transmit the new L1C/B signal. L1C/B is based on the same family of gold codes as L1C/A, but uses a binary offset carrier (BOC) modulation instead of the binary phase-shift keying (BPSK) and a different PRN range (203–206).

Compared to BPSK, the BOC modulation adds a square wave subcarrier with a frequency of  $f_{sc} = 1.023$  MHz that equals the chipping rate of the ranging code. This subcarrier shifts the peak spectral energy from the centre frequency  $f_{L1}$  to  $f_{L1} \pm f_{sc}$  to reduce interference with the GPS L1C/A signals.

Read more in *GPS World* article. [https://www.gpsworld.com/first-transmission-of-l1c-b-by-gzs-1r/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD220309002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/first-transmission-of-l1c-b-by-gzs-1r/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD220309002&oly_enc_id=1784A2382467C6V)

2022-03-08



### **Shipwreck of the 'Endurance' Found Safe Thanks to Satellite Data**

Over a century ago, Ernest Shackleton's ship *Endurance* sank in Antarctica, trapped and crushed by the ice. The crew survived and the incredible rescue operation made the polar explorer's expedition legendary. The wreck has now been located with the support of the German Aerospace Center. DLR provided TerraSAR-X satellite images that enabled safe navigation through the ice-covered Weddell Sea. DLR researchers on board the expedition's ship also studied the properties of sea ice to improve navigation in polar regions.

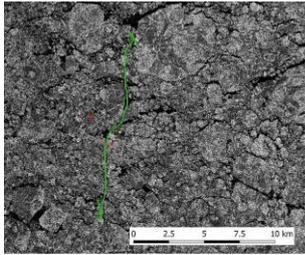
Sea ice is constantly changing. Winds and ocean currents can compress large masses of ice within hours and close open channels. If the ice is under pressure, floes can push over and under one another or extend vertically. Such pressure ridges are often impassable even for icebreakers.

Radar satellites like TerraSAR-X provide images of the Earth's surface as well as the surface of the ice and show different structures in the sea ice. Due to the active radar antenna this is possible even under overcast conditions and at night. These images are extremely valuable for the navigation of ships operating in polar regions.

Read more in *Space Daily* article.

[https://www.spacedaily.com/reports/Shipwreck\\_of\\_the\\_Endurance\\_found\\_safe\\_thanks\\_to\\_satellite\\_data\\_999.html](https://www.spacedaily.com/reports/Shipwreck_of_the_Endurance_found_safe_thanks_to_satellite_data_999.html)

2022-03-17



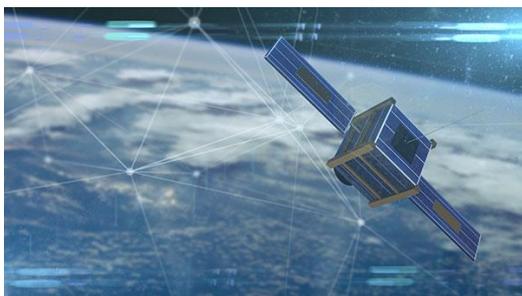
## **France Develops GNSS Backup Service Using Nanosatellite**

France has begun the Synchroncube project with an aim to provide a complementary service to GNSS. In the project, a low-Earth-orbit nanosatellite will provide synchronisation functions when GNSS navigation signals are unusable.

Development of the Synchroncube is part of the French recovery plan for the space sector. Planned to be 6U in size (typically 20 × 10 × 34.05 cm), the satellite platform is being developed by Syrlinks, which will provide both the payload and the ground receiver necessary to provide the location and timing service. Besides Syrlinks, companies taking part in the Synchroncube project include U-Space, (nanosatellite platform supplier), Anywaves (miniature antennas for satellites constellations) and Comat (satellite instruments).

Read more in *GPS World* article. [https://www.gpsworld.com/france-develops-gnss-backup-service-using-nanosatellite/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD220302002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/france-develops-gnss-backup-service-using-nanosatellite/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD220302002&oly_enc_id=1784A2382467C6V)

2022-03-04



## **Galileo 2nd Generation Satellites Ready to Navigate into the Future**

Airbus has successfully completed the Preliminary Design Review (PDR) for its system concept for the second generation Galileo navigation satellites. During this important

milestone, Airbus' proposed preliminary design and the customer's system requirements have been fully reviewed and agreed.

This paves the way for further verification, acceptance and qualification at equipment and module level. Verification at payload level is already in full swing, with the Critical Design Review (CDR) for the satellite structure also due shortly.

In parallel, the Airbus site in Friedrichshafen, on Lake Constance, is preparing for an industrialised production line for currently six second-generation Galileo satellites. The satellite integration centre, is being completely upgraded to meet current and future requirements for efficient, environmentally friendly, safe and secure production for the Galileo 2nd generation satellites.

Read more in *GPS Daily* article.

[https://www.gpsdaily.com/reports/Galileo\\_2nd\\_generation\\_satellites\\_ready\\_to\\_navigate\\_into\\_the\\_future\\_999.html](https://www.gpsdaily.com/reports/Galileo_2nd_generation_satellites_ready_to_navigate_into_the_future_999.html)

2022-03-09



## **EU Requires Galileo for Smartphone Emergency Calls**

As of March 17, all smartphones sold in the European Union must be leveraging Galileo signals in addition to other GNSS for calls to the European 112 (E112) emergency number. Using Galileo enhances pinpointing locations of 112 calls in Europe, resulting in faster response times and more lives saved, according to the EU Agency for the Space Programme (EUSPA).

The 112 emergency number is operational in nearly all EU Member States, as well as other countries. People in danger can call it 24/7 to reach the fire brigade, medical assistance and the police. Most calls to the 112 emergency number are placed from mobile phones. These calls already support the sending of location information to

emergency services. However, this information was not based on GNSS capabilities until recently.

Read more in *GPS World* article. [https://www.gpsworld.com/eu-requires-galileo-for-smartphone-emergency-calls/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD220302002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/eu-requires-galileo-for-smartphone-emergency-calls/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD220302002&oly_enc_id=1784A2382467C6V)

2022-03-04



## Coles Gears Up to Deliver Groceries by Drone in Australian First

Coles has announced it is launching a pilot program in partnership with global drone tech company Wing, to deliver groceries to your doorstep via the unmanned aircraft. It is the first major supermarket in Australia to offer the unique service, vowing deliveries within minutes.

Wing users in Canberra will be the first to trial the Coles pilot program in Australia, with curious shoppers ordering their groceries through the Wing app. The drone company is owned by Alphabet, which also owns Google.

Read more in *New Daily* article. <https://thenewdaily.com.au/life/tech/2022/03/02/coles-drone-delivery-wing/>

2022-03-02



## Google Maps Blocked Edits After People Falsely Claimed It Was Used to Coordinate Russian Air Strikes

On Thursday 24 Feb, the State Special Communications Service of Ukraine called claims that Google Maps "labels" were being used by Russia's military "another fake." In a post to its [official Telegram channel](#), the country's intelligence agency debunked a wave of social media rumours that claimed Russian insurgents had tagged airstrike locations on Google Maps of Kyiv and other Ukrainian cities.

The agency described these false claims as a psychological operation "to sow panic and misinformation among the population."

On Tuesday 1 March, responding to claims that its Maps were being used to coordinate Russian military activity in Ukraine, Google began removing user-submitted locations within the borders of Russia, Ukraine, and Belarus. The company is removing new content such as photos and business information "out of an abundance of caution," a Google spokesperson told BuzzFeed News.

Read more in *article...*

<https://www.buzzfeednews.com/article/sarahemerson/russia-google-maps-tags-ukraine>

2022-03-02

