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in cooperation with

EUROPEAN
SATELLITE NAVIGATION
COMPETITION 2016

THE RESULTS, 13TH EDITION

www.esnc.eu

special prize partners

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VOICES FROM OUR SUPPORTERS

“Leveraging the full potential of European GNSS”

Today, people and businesses around the world depend on GNSS. In 2014, there were already an estimated 3.6 billion GNSS devices in use. By 2019, this number is expected to increase to over 7 billion – the equivalent of one device per every person on the planet. According to the most recent edition of the GSA’s GNSS Market Report, European companies account for one quarter of this global GNSS market. Add these numbers together and what becomes clear is that it is essential that Europe continue to play a leading role in the development of the global GNSS market.

At the forefront are EGNOS and Galileo – Europe’s GNSS programmes. Today, EGNOS is operational and delivering valuable services to such market segments as aviation, agriculture, mapping, rail, road and maritime. With the recent launch of Galileo satellites number 13 and 14, Galileo Initial Services will be launched by the end of the year – ushering in a new era of exceptional growth for European satellite navigation.

All of this is growth is happening in parallel with the ongoing evolution of GNSS technology, including chipsets and receivers. Both EGNOS and Galileo are increasingly found in GNSS receivers, providing enhanced performance to users and answering a growing demand for ubiquity, automation and secure positioning. To better understand the impact of this evolution in GNSS user technology, the GSA recently published its first GNSS User Technology Report. The Report, written with contributions from leading GNSS receiver and chipset manufacturers, zeros in on state-of-the-art GNSS receiver technology and analyses the trends that are sure to shape the entire GNSS landscape in the years to come.

Forecasting the development of GNSS markets and technology is essential for our mission. The GSA is committed to boosting European GNSS market uptake – both directly and by supporting the efforts of other actors. For example, in recent years the European Satellite Navigation Competition (ESNC) has fostered many innovative GNSS developments and applications in Europe, which is why the GSA has been a key partner and sponsor of the competition and has awarded a Special Topic Prize since 2008.

This year, with the launch of Galileo Initial Services and the continued growth of EGNOS, the GSA is putting into practice all that it has been preparing for. As a result, European citizens, businesses and entrepreneurs will benefit from the many innovative opportunities created by European GNSS.

I would like to wish all of the 2016 ESNC winners much success in leveraging the full potential of EGNOS and Galileo.

Carlo des Dorides
Executive Director
European GNSS Agency (GSA)

“EGNOS is here, Galileo is coming”

With the Galileo initial services about to be declared, European satellite navigation will truly become operational. It is a major demonstration of how EU Member States can bond and work together, to achieve a result that is more than just the sum of its parts. The European satellite navigation systems, EGNOS and Galileo are no longer just an idea or a project, they are a reality – innovative space technologies made in Europe that entrepreneurs can rely on.

We have come a long way since the two systems were conceived in the early 2000s. EGNOS and Galileo have shown that Europe can be an important player in the space domain, a catalyst and a magnifier of our EU Member States’ strengths. Around the time of the Satellite Masters Conference, the Commission will publish its Space Strategy setting out our objectives and strategy in space for the years to come. This will be an opportunity to reflect on the future of EGNOS and Galileo.

In parallel, while deploying the system’s upstream infrastructure, we have also been working with downstream communities at user level. This will ensure that the benefits of EGNOS and Galileo will trickle down to all sectors that need reliable and independent position, navigation and timing to deliver their services, perform their duties, create economic value and jobs, and ultimately generate positive results for society at large.

Downstream entrepreneurs and start-ups play an important role. They are the ones bringing EGNOS and Galileo down to earth through the applications they develop. This is where the European Navigation Satellite Competition (ESNC) plays a crucial role. Building upon the well-established ESNC infrastructure, the Commission-funded Galileo-EGNOS Prize Award Scheme (GEPAS) has long encouraged innovators wanting to use EU satellite navigation technology.

The ESNC has accumulated a track record of success in fostering innovation and application development in satellite navigation since its launch in 2004. I would like to once more thank the ESNC’s organiser, Anwendungszentrum Oberpfaffenhofen, for their continued work and commitment.

At the Commission we have drawn very positive lessons from this award scheme and therefore hope to continue it – as an enhanced version – in the very near future, by accompanying entrepreneurs and start-ups as they move beyond idea conception into the incubation and development phases of true commercial ventures.

EGNOS is here, Galileo is coming. Chipsets and receivers using their signals are already on the market. It’s time for entrepreneurs to get on board.

Matthias Petschke
Director for the European Satellite Navigation Programmes of the European Commission

“FOSTERING THE GNSS OF THINGS”

ORGANISERS INTRO

The European Satellite Navigation Competition (ESNC) is the accelerating instrument for space-related entrepreneurs and startups, providing Europe with path-breaking novelties. Since its initiation in 2004, the ESNC has always been scouting the most forward-thinking applications based on satellite navigation and remains to set benchmark levels of space-related innovations for Europe.

The hottest topics of the space sector, regarding Europe’s global satellite navigation system (EGNSS) were once again addressed in the ESNC 2016. As the Internet of Things (IoT) and open source services are rapidly developing with a wide-ranging scope of application fields, the importance of Galileo is continuously increasing. Open source services and platforms rely on extremely precise, up-to-date and continuous data over long periods of time, in brief GNSS information. Therefore, we speak about the „GNSS of Things“ being a driver of innovation and development of the IoT. As the ESNC has always been promoting the newest trends related to commercial space applications, the ideas competition dedicated a Special Prize solely to the topic of civilian unmanned aerial vehicles (UAVs) this year. Due to their need for precise positioning and orientation, UAVs constitute a valuable growth market for GNSS. Moreover, accelerating the cooperation between Europe and Asia displays an excellent example of the ESNC’s international outreach and its endeavour to provide the maximum benefit to society.

No matter what stage a pioneering idea is at, the ESNC provides support for innovative ideas at each development stage, with the ultimate aim to turn them into real business cases. Thus, the diversity offered by the ESNC and its entire network are best described as “service all along the value chain”. Thereby, the ESNC is not only the prestigious competition for GNSS-related ideas but also serves as Europe-wide and effective support mechanism for entrepreneurs and startups. Industrial and institutional stakeholders as well as numerous regional partners are strong assets of the ESNC network and award the winners of the different challenges with prizes valued at approximately EUR 1 million.

This year’s edition of the ESNC received high quality submissions tackling the most urgent questions of business and society, by offering space-based solutions. With 413 innovative entries submitted and more than 80% newly gained participants from over 40 countries the 2016 edition recorded an outstanding result. This adds to the success story of the competition and brings its totals to 305 awarded winners, 3,756 ideas submitted and more than 10,000 participants over the past 13 years.


© Mathias Kimbacher

We would like to take this opportunity to thank our more than 250 international experts, who took the time to thoroughly evaluate the submissions and carefully select this year’s winners.

Very special thanks are also due to Madrim+d and Comunidad de Madrid for co-organising this year’s Awards Ceremony and Satellite Masters Conference. This conference provides the unique opportunity to connect with the world’s leading network for space applications and will showcase some of the most brilliant awardees of the ESNC – both from this year and past editions. We are taking this success story to the next level with our six Spanish partner regions and our Special Prize Partner Xunta de Galicia. As the commercial space sector has always been characterised by truly pan-European collaboration, AZO has lived the European spirit and provided support at the regional dimension from the very beginning.

Through their dedicated support, our regional partners – including national space agencies, ministries, space clusters, universities and incubators comprising more than 160 stakeholders – form the backbone of the global ESNC network. Particular thanks go out to our longstanding partner regions, which continue to be truly pivotal in making the ESNC a success each year:
Asia, Austria, Baden-Württemberg, Bavaria, the Basque Country, Catalonia, Czech Republic, Flanders, France, Galicia, Hesse, Ireland, Israel, Lithuania, Madrid, the Netherlands, Norway, Poland, Romania, Switzerland, United Kingdom and the Valencian Community. We are also grateful to have Andalucía, and Sweden on board as new partner regions.

Meanwhile, more than 90% of this year’s entries were submitted for a Special Prize in addition to one of the Regional Prizes. These innovative ideas display the great potential the ESNC offers in providing solutions to specific commercial needs. This year’s Special Prizes are awarded by some of the most relevant institutional stakeholders: The European GNSS Agency (GSA) with its focus on applications using Galileo’s Initial Services; the European Space Agency, which presented the ESA space solutions® Prize; the German Aerospace Center (DLR), which was looking for innovations in the context of “Entry into Service – Head Start with Galileo Services!”; and the Federal Ministry of Transport and Digital Infrastructure (BMVI), which focused on the Galileo PRS service. Two additional Special Prizes celebrate their premiere this year: The BELS Prize for innovative GNSS solutions for South East Asia – organised the Horizon2020 project BELS and the UAV Special Prize, honouring the most promising ideas concerning UAV systems for civilian applications, hosted by Xunta de Galicia. Further prizes were conferred in connection with the GNSS Living Lab Prize and the University Challenge.

We have also been delighted with the huge amount of media interest and would like to thank our media partners for spreading the word about the ESNC.

Above all, I would like to express my gratitude to all participants and congratulate all the winners in the 2016 competition and wish you all the best in realising your excellent services, products and applications! I would be happy to see you obtain support from one of the incubators in our Europe-wide network – which, of course, includes the ESA Business Incubation Centres.

We are already looking forward to the next edition of the ESNC, which is scheduled to run from April to June 2017.

Thorsten Rudolph
Managing Director
Anwendungszentrum GmbH Oberpfaffenhofen

AZO

THE GLOBAL INNOVATION NETWORK FOR GALILEO

SPECIAL PRIZE PARTNERS

Boosting commercial GNSS applications

The ESNC – the world's largest innovation network for satellite navigation applications – is firmly supported by the most important and future-oriented GNSS stakeholders in Europe. They are united in their goal to systematically support emerging visionaries and to achieve the integral promotion of innovation and entrepreneurship along the GNSS value chain for the benefit of the citizens of Europe and beyond.

THE GLOBAL INNOVATION NETWORK FOR GALILEO

REGIONAL PARTNERS

Regional dedicated support

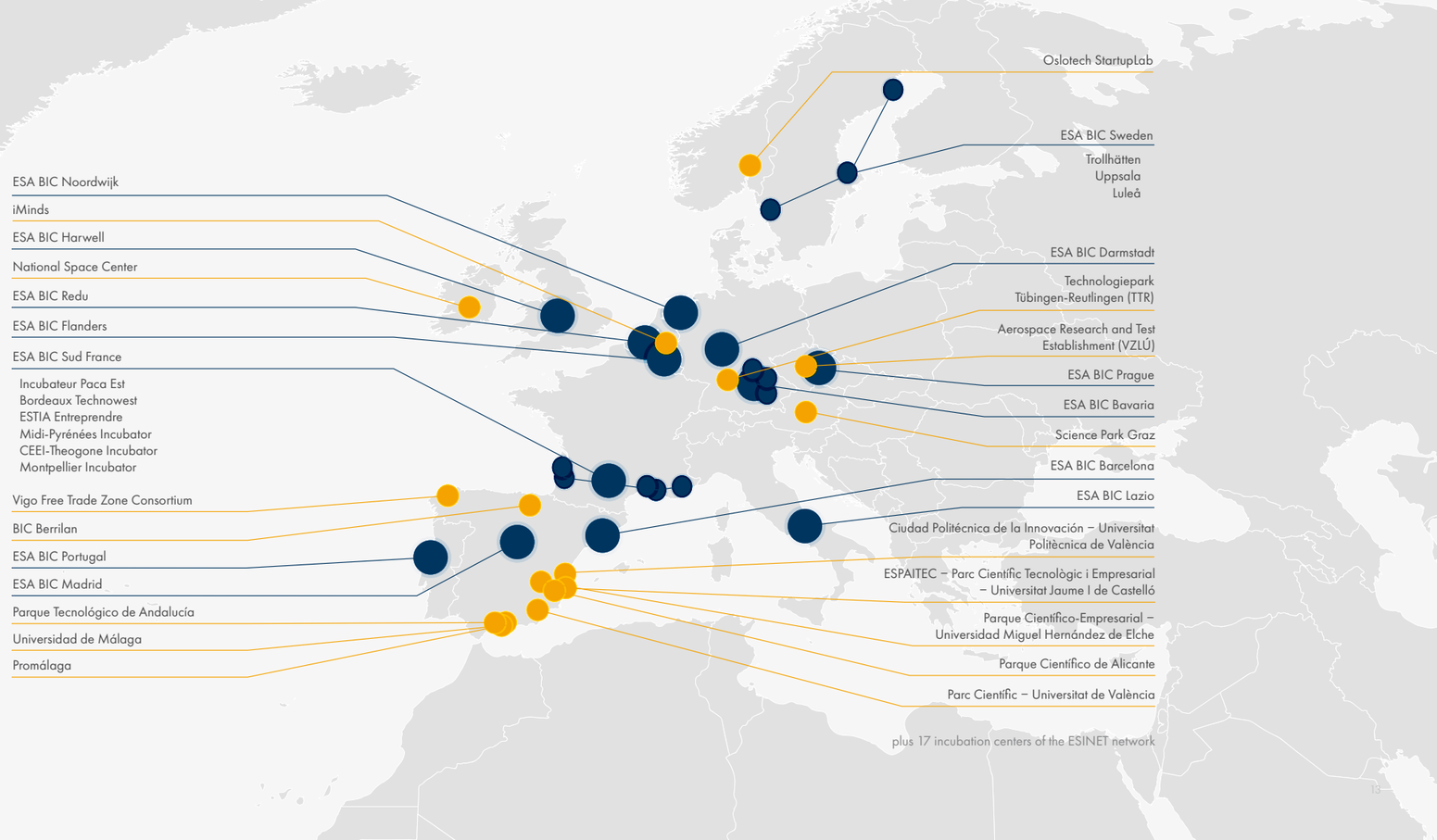
The ESNC's outstanding regional network demonstrates how the pan-European identity provides the solid basis for Europe's space exploration. Its 24 partner regions comprise more than 160 stakeholders at the regional level. These partner regions form the backbone of the competition's global network and ensure that participants can access the support they need at any stage to launch their businesses all across Europe and beyond.

THE GLOBAL INNOVATION NETWORK FOR GALILEO

INCUBATION NETWORK

Encouraging the creation of new businesses

The competition provides a Europe-wide support mechanism for entrepreneurs who want to get their space-based business off the ground. With more than 40 incubators all over Europe and beyond, the ESNC encompasses the world's largest space-related incubation network. This network supports startups along the entire value chain and provides society with game-changing innovations.



European GNSS Agency (GSA)

The GSA, a European community agency, works with the European Commission on a range of activities aimed at helping European entrepreneurs and businesses – especially high-tech SMEs, business incubators and related networks – commercially exploit EGNOS and Galileo.
These marketing, promotional and R&D activities help ensure that European industry maintains a competitive edge in the global satellite navigation market. EGNOS is Europe's first venture into satellite navigation and is available free of charge. It augments GPS and makes it suitable for safety-critical applications. It will be followed by Galileo, a full-fledged global navigation system.

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2ND PLACE THE MOST INNOVATIVE APPLICATION IDEA FOR GALILEO INITIAL SERVICES

SPECIAL PRIZE WINNER

UAV

Drones2GNSS – the Future of Surveying: UAV-assisted GNSS Positioning in Obstructed Environments

GNSS positioning accuracy in urban canyons or under tree canopies is degraded when satellite signals are obstructed by buildings, geomorphology, and vegetation. This is a major problem for engineers, who are forced to draw on expensive, time-consuming solutions to gain centimetre-level positioning accuracy. To confront this challenge, Space Geomatica has developed a prototype drone equipped with a highly accurate GNSS receiver and a camera/laser measuring system that retrieves the coordinates of custom surveying poles featuring Wi-Fi, a prism, and a target marker. The team's image processing algorithms and error correction techniques provide real-time, centimetre-level coordinate estimation and can simultaneously measure multiple moving surveying poles. The processing is performed on-board the UAV without any ground-based hardware. Drones2GNSS thus provides a fast, reliable, cost-effective alternative for absolute coordinate positioning in obstructed environments where GNSS fails. It can cover multiple targets, including cars, people, and vessels. It offers a basis for other related challenges, including UAV GNSS networks, indoor positioning, and error mitigation.

contact winner

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ESA SPACE SOLUTIONS® PRIZE 3RD PLACE

SPECIAL PRIZE WINNER

NAVIGATION

Blubel – SatNav in a Connected Bicycle Bell

Blubel is a smart bicycle bell that guides cyclists simply and intuitively using a mix of sounds and lights. Cyclists no longer have to worry about getting lost or distracted on busy roads or having to pull out their phone while cycling; a quick glance at Blubel on their handlebars will indicate the next turn and the heading of their final destination. Powered by its smartphone app, Blubel learns from other cyclists and suggests the fastest, safest, and easiest routes. It also detects when the cyclist rings the bell in the presence of potential dangers, such as crossing pedestrians. Finally, Blubel can collect data on the routes the cyclist prefers and other aspects to improve its route calculation for the rest of the community.

contact winner

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European Space Agency (ESA)

ESA, an international organisation comprising 22 member states, is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. The ESA space solutions network compiles a variety of expertise from Europe's space programmes to give any business a tailored solution, based on available space systems, technologies and know-how. Through our Business Incubation Centres, Technology Transfer Brokers and partners, Europe benefits from its space industry like never before, and together we support our national industries and boost Europe's global competitiveness.

www.esa.esnc.eu

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German Aerospace Center (DLR)

DLR is the national aeronautics and space research centre of the Federal Republic of Germany. Its extensive research and development work in aeronautics, space, energy, transport and security is integrated into national and international cooperative ventures. In addition to its own research, as Germany's space agency, DLR has been given responsibility by the federal government for the planning and implementation of the German space programme. DLR is also the umbrella organisation for the nation's largest project execution organisation.

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ENTRY INTO SERVICE – HEAD START WITH GALILEO SERVICES!

Augmented Crane Navigation System (ACNS)

Augmented Crane Navigation System (ACNS) is designed to increase efficiency and safety in tower crane operations. Modern tower cranes can be more than 200 metres tall and operate in very complicated and complex environments. This implicates some significant impediments for crane operators, particularly with regard to seeing clearly at such distances and contending with blind spots – that is, angles that are obstructed by other construction equipment. To deal with this challenging environment, ACNS incorporates a 3D digital model of the construction site at hand and several high-precision GNSS receivers located throughout the crane. The GNSS receivers provide data on the rotations and movements of the load, which is then used for real-time navigation. Based on the navigation directions provided, the operator can safely deploy a load, even when the destination is not visible. ACNS is a forward-thinking concept for tower crane operations. Thanks to its user-friendly navigation tips, operations are possible even under very difficult conditions. ACNS also offers a basis for the complex automation of tower cranes.

© Piotr Krystek

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PRS APPLICATIONS – RELIABLE SERVICES FOR A SECURE DIGITAL SOCIETY

GRIPPA – A PRS-enabled Smartphone Sleeve for Critical Applications

The encrypted nature of Galileo's Public Regulated Service (PRS) means that a PRS receiver must load, store, process, and destroy classified cryptographic keys. This adds a security, complexity, and cost overhead to operating a PRS receiver and key delivery infrastructure. A server-PRS distributed approach enables PRS-assured positions and times to be provided as a service to applications in which a full PRS receiver is not practical, which extends the security benefits of PRS to new users. GRIPPA brings the loose integration of server-PRS to standard mobile phones. The result is an Android phone that displays PRS-assured positions on a map. This is achieved through a small module attached to the phone as a sleeve, like an external battery.

GRIPPA targets markets that require access to highly reliable positioning and timing on mobile devices, such as police and emergency services. Government users like these are particularly vulnerable to GNSS spoofing, which can impact their ability to ensure the security and safety of citizens. Galileo's PRS capability has been incorporated into an end-user product and the entire process has been demonstrated to stakeholders and user communities in real time using live signals.

contact winner

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Federal Ministry of Transport and Digital Infrastructure (BMVI)

The German space industry is playing a key role in Europe's future Galileo system, with OHB System AG (Bremen) and Astrium GmbH (Munich) constructing 32 Galileo satellites and one of the two main Galileo control centres being operated in Oberpfaffenhofen. The German Federal Ministry of Transport and Digital Infrastructure (BMVI) supports high-quality economic growth, by ensuring a sophisticated infrastructure for smart mobility and development in modern society. The Public Regulated Service (PRS) offered by Galileo, is the first encrypted navigation signal under civilian control. While the use of the Galileo PRS by governments, security authorities, as well as emergency and rescue services in EU Member States is evident, the full potential of the signal in today's connected and digital society is yet to be explored. Therefore, the BMVI is strongly committed to driving innovative applications making use of the PRS.

www.prs.esnc.eu

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Xunta de Galicia

The Government of Galicia (Xunta de Galicia) is the executive body of the autonomous community of Galicia.
In line with the Smart Specialisation Strategy, they are highly committed to develop a European reference pole on aeronautics, implemented around Rozas Aerodrome and the future INTA-Xunta Investigation Centre (CIAR). Within the framework of this policy, the Galician government has launched the Civil UAVs Initiative for the use of unmanned aerial vehicles for civil purposes and to help improve the provision of public services. Galicia aims to position itself as a hub for aeronautics and UAV development in Europe and foster economic development through the creation of new jobs and companies in the UAV market. The UAV Special Prize is supported by the Galician Innovation Agency (GAIN), which is also responsible for implementing and coordinating the region's Smart Specialisation Strategy. This prize is further supported by INAER and INDRA.

www.uav.esnc.eu

organised by

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UAV SYSTEMS FOR CIVILIAN APPLICATIONS

SPECIAL PRIZE WINNER

UAV

CANARD – Calibration of Air Navigation Safety Beacons with Unmanned Aerial Vehicles

Safety is the number-one priority for the air transportation industry, which is the second largest industry sector in the world in regards to revenues after oil and gas. Airports spend billions on safety worldwide, including on safety beacons (called navigational aids) that help pilots land safely. These systems are calibrated periodically from the air to ensure they work and comply with international regulations. Currently, executive airplanes with bulky and expensive on-board sensors are used to perform the calibration from the air. Canard Drones has created CANARD to check navigational aids more efficiently using smart drones instead of manned aircraft. This saves airport managers massive amounts of money by reducing their operational costs and helping prevent lost income due to closed runways. Some other main advantages include the system's complete lack of environmental impact and risk to human life. CANARD has been selected as one of the most promising European tech solutions by Google´s Startup Next and funded by the European Space Agency's business incubator programme. It has also participated in the Startupbootcamp in Amsterdam and won the FINODEX, StartupOle, and Expodronica startup competitions!

contact winner

CANARD

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INNOVATIVE GNSS SOLUTIONS FOR SOUTH EAST ASIA

SPECIAL PRIZE WINNER

HEALTH

ATTracT – Autism Trigger, Tracking and Trace

Every year, approximately 9,000 children in Malaysia are born with autism. Children with autism face challenges in terms of their communication skill, tendency to wander, and lack of safety awareness. The main idea of ATTracT is to develop a system that uses GNSS-enabled devices tailored to the needs of autistic children who have a propensity to wander. Parents will be provided with a system they can use on their mobile phones to track and monitor their children in real-time. The aim is to set up a defined movement zone (with virtual boundaries) that will be activated according to a daily schedule. Alerts will be sent immediately to parents' smartphones if their child crosses a virtual boundary, and ATTracT can also store corresponding movement histories. In addition to mobile devices, a real-time monitoring system will also be set up to help schools or autism rehabilitation centres track the movement of the children under their supervision at the same time. The system will thus provide parents and autism centres with an effective and reliable method of monitoring children with autism.

contact winner

MOSTI ANGKASA ATTracT

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BELS Consortium

BELS (Building European Links Toward South-East Asia in the field of EGNSS) is a project funded by the European Union under Horizon 2020, the EU Framework Programme for Research and Innovation. Lead by ISMB, the project involves several partners from R&D, academia and industry. The main objective of the BELS project is to facilitate the breakthrough of European Global Navigation Satellite Systems (E-GNSS) technology and increase the collaboration between Europe and South East Asia (SEA), a fast growing market of more than 600 million people. Therefore BELS is conducting a set of coordinated activities to raise awareness and build capacities for the exploitation of GNSS technologies with a strong focus on industrial partnership and support to enterprises. The BELS special prize aims for smart young entrepreneurs and researchers from South East Asia, who will gain the possibility to interact with European companies and research centres.

www.bels.esnc.eu

organised by

BELS

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AZO & GRACE

The FP7 project GENIUS focused on building strong links between universities, research institutes and industry. It provided direct benefits to industry through implementing measures to strengthen GNSS education and through the fostering of cooperation between education, research and business. The ESNC University Challenge is carried out by Anwendungszentrum GmbH Oberpfaffenhofen (AZO) and the GNSS Research & Applications Centre of Excellence (GRACE). It connects innovative thinkers with the business community to pave the way from university to entrepreneurship.

www.uni.esnc.eu

Message in a Bubble (MiaB): Pinpoint the Present, Empower the Future

Communication in the right place and time is essential to support human relations and highlight important information. Message in a Bubble (MiaB) is a novel spatio-temporal exchange platform. Users can tie their message, story, picture, or memo to a point of interest, or "bubble"; let it float for a set amount of time; and share it with select users or everyone who enters the same physical space. Users can create a bubble in their actual location, or virtually on a web map. A series of intuitive, exciting, and informative applications provide a novel incentive for interaction, including through virtual road signs, dynamic ambulance route clearance, treasure hunt games, message or payment unlocking, tourist guides, outdoor classroom notes, and location-based advertisements. Additional activities could require a specific group of friends, a certain number of passes over a certain time, or a PIN code to unlock a bubble. Bubbles can be static, moving, or distributed. Moreover, users can interact in space through bubble "libraries", with topics including history, gastronomy, ghost stories, architecture, geology parks, and more! MiaB thus represents a limitless trend in social communication.

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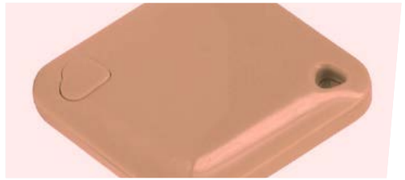
AZO

Having been initiated as part of the FP7 project GAINS (Galileo Advanced INnovation Services), the GNSS Living Lab Prize is now being continued by AZO and four partners. The GNSS Living Lab Prize seeks to facilitate the emergence of user-driven, open innovation demand for services and GNSS applications. Living Labs – Public-Private-People-Partnerships (PPPP) of firms, public agencies, universities, institutes, and users – in Bulgaria (Digital Spaces Living Lab), Sweden (Digital health Lab, SICS Swedish ICT), France (Integrative Usage Lab), and Spain (espaitec Living Lab) are now prepared to conduct a reality check trial with the winning application and up to four finalists.

www.livinglabs.esnc.eu

GoWalk – 'Fitbit' for Elderly People to Keep them Independent and Healthy

GoWalk is a health and wellbeing coach specifically designed for elderly people. It is a keyfob containing a GPS module, battery and wireless recharger. Activity trackers such as Fitbit are highly successful, with sales of $1.86B last year, with over 29 million devices in use. However, few elderly people use fitness trackers and find smartphone apps difficult to use. The innovation of GoWalk is a GPS tracker in a keyfob, with wireless recharging and display of results in an email, on a tablet or laptop. The GoWalk keyfob is attached to the house-keys and the house-keys are stored near the front door, next to a wireless recharger, so that the users do not need to remember to recharge their keyfob. Recent advancements in GNSS technology give long battery life from a small keyfob. Galileo GNSS improves the accuracy of the tracking data. People aspire to remain fit and healthy, but need regular encouragement. GoWalk helps people to maintain a regular fitness routine by using gamification techniques such as targets, leader boards etc. The benefits of maintaining fitness are maintaining independence and improved self-confidence. GoWalk reduces the risks of sudden illness and entering hospital.



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ANDALUCIA / SPAIN

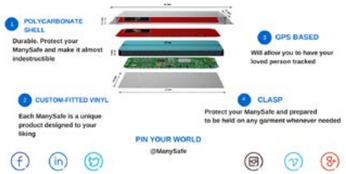
REGIONAL WINNER

HEALTH

ManySafe.Pin: Ecological, Customisable, Autonomous GPS with Global Reach – and No Battery

ManySafe is an improved version of the Iberpin product, which is already approved, patented, and on the market. The autonomous, customisable pin with built-in GPS can be attached to clothing and recharges itself via biomechanical movement and RF uptake. ManySafe facilitates the localisation of people, especially children, people with special needs, the elderly, and professionals who require monitoring. Since a prior version of ManySafe is already on the market and proven to work, the possibility of technical or manufacturing errors is much smaller than with a completely new product.

Both the costs of research and development and the investment needed to bring ManySafe to market will be lower, and ManySafe will not require a new patent thanks to its use of Iberpin's patented technology. Meanwhile, the ability to customise a product is always well received by the market because it offers the exclusivity that many people value. ManySafe thus combines practical utility with a certain degree of individuality.



contact winner

ManySafe

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Worldpin s.l.

University of Malaga, Promálaga and Parque Tecnológico de Andalucía

The regional partners of Anadalucía comprise three organisers: University of Malaga (UMA), Promálaga and Parque Tecnológico de Andalucía (PTA). UMA is a public institution responsible for higher education with more than 2,300 teaching positions and 3,9000 students. It has a long history of collaboration with major international and technological companies. Promálaga is a development and business promotion agency dedicated to job, wealth and welfare creation in the city of Málaga, Spain. It is inspired by the promotion of the entrepreneurial spirit and has a network of technological, creative and cultural business incubators related to space. With exceptional advanced services and infrastructures, the PTA is a high-quality location to set up SMEs and large businesses that are innovative, respectful of the environment and geared towards manufacturing, advanced services and R+D.

www.andalucia.esnc.eu

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ASIA

REGIONAL WINNER

UAV

Digital Media Convergence and Drone Video Capturing with Social Networking – Sharing & Profiting

Industry amalgamation is the future trend in the Internet of Things (IoT). This proposed system will usher drones into the entertainment industry. Thanks to the declining cost of drones, it has become easier for the media industry to produce programmes with aerial images and even customise them to different target audiences. The system at hand uses drones to provide a bird's-eye view for broadcast productions at festival events. At an affordable price, attendees can show off their personal close-ups during the broadcasting of an event. When a drone's GNSS location matches that of a pre-registered individual in the crowd, it delivers content with customised close-ups for that particular person. Through social networking, individuals can invite their friends, mutual friends, or even followers to watch a given programme, which generates more viewers. This in turn not only increases audience adherence to the programme in question, but also results in further advertising revenue streams for the broadcasting media company and enables it to send its own context-aware ads to individual viewers based on their locations and interests.

contact winner

III

FESTIVAL

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GNSS.asia

The Asia-Pacific rim is a hotspot for satellite signal reception and is likely to be at the forefront of multi-constellation usage, which will result in increased accuracy, availability, and reliability for the fast-growing population of GNSS users in Asia. Asia is also the manufacturing hub of GNSS downstream equipment, chipsets, and receivers and home to some of the most innovative technology companies. Many Asian companies are increasingly taking key positions along the GNSS value chain, and several countries are starting to produce significant amounts of locally developed innovations. GNSS.asia provides a comprehensive range of hands-on support services to the GNSS industry in Europe and the Asia-Pacific region. These are designed to aid the sector in developing mutually beneficial commercial activities and establishing industrial collaborations. GNSS.asia and its partners also represent the platform and the GNSS industry at several key GNSS events across Europe and the Asia-Pacific region.

www.asia.esnc.eu

organised by

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Austrian Research Promotion Agency (FFG)

The national funding institution for applied research and development in Austria offers a comprehensive range of services for enterprises, research institutions and researchers. Its Aeronautics and Space Agency connects such entities with the international aerospace world, implements Austria's aerospace policy, and represents the country at international aerospace committees – incl. ESA. Austria's ASAP programme, meanwhile, funds research on space science, technology, and applications. Finally, the agency acts as the central interface between Austrian interests and European programmes, FFG's Galileo contact point supports Austria's competencies in the field of satellite navigation and interacts with the GNSS community.

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AUSTRIA

REGIONAL WINNER

SAFETY & SECURITY

Intelligent Drone Rescue System

The intelligent Drone Rescue System aims to become the first safety solution users choose for UAVs. The team behind it has discovered a large gap in the market: the safety of both people and property. The goal is to develop a fully automated intelligent rescue system that can be installed on the most common drones without any structural modifications to the UAV. Using completely independent electronics, it will be capable of landing a drone safely in case of an emergency. The main idea is to equip the system with various sensors that monitor and analyse all of a UAV's movements in real-time. If a malfunction occurs, the system will detect it within a fraction of a second and autonomously deploy a rescue parachute, enabling the UAV to land safely and protecting both the equipment and people on the ground. This specially designed mechanism requires very little energy, enabling it to function even if the power supply fails completely. In addition, its GNSS functionality keeps UAVs out of prohibited zones.

Benefits of the connected app:

- GNSS positioning
- Data recording
- Flight analysis
- Possible upgrades for UAVs

© Drone Rescue System

contact winner

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BADEN-WÜRTTEMBERG / GERMANY

REGIONAL WINNER

CONSTRUCTION

Civil engineering 3D+ guide

The civil engineering 3D+ guide developed by MTS defines data formats and digital construction processes from planning to billing in conjunction with the corresponding product platform MTS PILOT. It provides a toolbox for implementing digital building sites, from the processing of building plans, construction, and 3D machine control to measurement and billing. In contrast to existing isolated solutions, MTS always factors in the entire construction process and the many interfaces involved. As a result, its components work together in concert, as well as in combination with the individual pieces of equipment in its package solution. In addition, the overall package is specially designed to account for specific needs in underground and road construction by automatically fulfilling the requirements of relevant regulations such as VOB and REB (Construction Tendering and Contract Regulations; Regulation for electronical work accounting).

Last but not least, the MTS solution boasts an extremely simple application that requires no expert knowledge. In another unique feature, the complete digital construction process can be mapped and managed on a single computer.

©MTS

contact winner

MTS make innovation

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IHK Reutlingen

Baden-Württemberg, the federal state in the South West of Germany and home to 11 million inhabitants, is famous for its tourist highlights, such as the Black Forest and Lake Constance, its universities in Heidelberg, Freiburg, Karlsruhe, Constance, Stuttgart, Ulm, and Tübingen; as well as the companies Daimler, Porsche, SAP and Bosch. The state is known for its great writers like Friedrich Schiller ("Wilhelm Tell") and its people are known as „Tüftler", a term indicating a great enthusiasm for technical problems and their solution. Thanks to its open-minded spirit, Baden-Württemberg is ideally positioned to participate in the ESNC.

www.bw.esnc.eu

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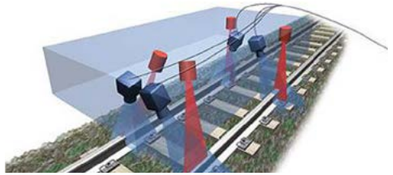
BASQUE COUNTRY / SPAIN

REGIONAL WINNER

RAIL

Position-based Automatic Rail Track Monitoring System (PARTS)

Physical damage on rail-tracks can threaten the safety of a railway system as a whole. Current damage detection methods are costly and usually only performed on a yearly basis. The PARTS system is a compact, laser-based light source combined with an on-board digital camera that makes it possible to visualise rail profiles. The system can take images or videos to help its control computer determine whether a rail is in good shape or shows signs of wear. Images of detected damage are reported along with precise track positions thanks to an embedded GNSS system. A combination of Galileo and the EGNOS support system is the GNSS service of choice of the PARTS project. For underground operations, it can be supported by the Simultaneous Localisation and Mapping (SLAM) system or a dead reckoning inertial positioning system. The PARTS system is a cost-effective solution that reduces the costs rail operators incur through track inspection. It can be installed on existing or new rail vehicles. Train builders can thus provide vehicles suitable for both transportation and maintenance inspections to meet the current high demand from train operators. The benefits are clear: reduced maintenance costs, reduced maintenance time, and constant monitoring of rail conditions during normal train operations.



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Department of Economic Development and Competitiveness of the Basque Government

The Department of Economic Development and Competitiveness of the Basque Government boosts the participation of Basque projects in the international European Satellite Navigation Competition (ESNC). To that end, with the help of the SPRI agency and BIC Gipuzkoa, the Information Society Division coordinates the organisation of the competition in Euskadi and sets a regional prize. The Ministry for Economic Development and Competitiveness coordinates the design and implementation of the Basque R&D&i Policy. That policy is widely known as an example of a very strong regional compromise with knowledge and industrial development. Manufacturing plays a major role in the Basque industry and the Basque Government is committed to support its manufacturing industrial base, by promoting higher value added production through R&D and innovation.

www.basque.esnc.eu

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BAVARIA / GERMANY

REGIONAL WINNER

ENTERTAINMENT

Night Vision – An App That Increases Visibility

To use the Night Vision app, users only need to hold their smartphone in the direction they are looking to display matching Street View images automatically on-screen. Based on the GNSS-receiver of the smartphone, the position is determined and databases with the matching image are accessed. This new app offers a user-friendly means of exploring your surroundings in darkness or poor visibility (due to fog, for example). By supporting your orientation and helping you find specific places, it represents a logical extension of existing navigation systems. In addition, with the Night Vision app, it is possible to download the street information of shops and restaurants simply by pointing your phone at them. On an airplane, you can look at the ground even when it is cloudy or you do not have a window seat.

contact winner

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AZO

AZO was set up in 2004 by the German Aerospace Center (DLR) and the Bavarian Ministry of Economic Affairs at the prominent aerospace location Oberpfaffenhofen, located near Munich. The company's main goal is to drive innovation and incubation in the commercial use of space technologies and infrastructures. Through the leading innovation networks for satellite navigation (ESNC) and Earth monitoring (Copernicus Masters), AZO drives the creation of innovative products, services, and business concepts for these emerging market segments. The underlying business concepts are realised in the form of company foundations as part of the incubation programme at ESA BIC Bavaria.

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CATALONIA / SPAIN 2ND PLACE

Government of Catalonia

The Government of Catalonia conducts policy, manages the Government's Administration and holds executive and regulatory powers. These powers comprise e.g. developing and implementing government budget, approving bills and issue legislative decrees and appointing the Government representatives in certain institutions, organisations and companies. Its permanent headquarters are located in the City of Barcelona, with its bodies and branches located around Catalonia. The Government of Catalonia is developing SmartCATalonia, the strategy that is designed to make Catalonia an international smart region benchmark. It aims to take advantage of the digital technology and information, in order to encourage innovation in public services, foster economic growth and promote a more intelligent, sustainable and integrative society. These strategy goals are to improve the services provided to citizens, by means of a more efficient and intelligent use of available information in real-time.

www.catalonia.esnc.eu

REGIONAL WINNER

UAV

Kowat – Biomimetic Drones and Fear as an Ecological Method of Pest Control

Kowat addresses the problem of bird pests using an ecological approach based on the use of stress and fear, which it produces with drones that imitate specific birds of prey. The drones automatically fly around the areas to be protected, scaring off unwanted types of birds. Kowat aims to support a wide range of applications in areas where birds cause problems, from improving crop yields to making aviation more secure. With proper global use, it can help improve food production (especially in developing countries), reduce chemical use, and increase security. Avian pests cause losses of 15-25% in crops and fish farms, and they can carry pathogens that cause pandemics among humans and other animals. The innovation behind Kowat applies scientific knowledge of how birds of prey behave to specially adapted drones. This approach facilitates remarkably effective pest control (60-90%). Based on GNSS, the autopilot allows for safe, aggressive, and precise simulated attack flights without the need for highly skilled drone pilots – even under difficult conditions. This seemingly simple idea is currently protected by patents and is subject to no limiting regulations on its commercial exploitation.

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CZECH REPUBLIC

The Ministry of Transport of the Czech Republic

The Czech Ministry of Transport has a mandate given by the Czech Government to coordinate all space activities in the Czech Republic. It is responsible for Czech membership in the European Space Agency, EU space policy, satellite navigation development, space applications and partnership with the European GNSS Agency (GSA). It also acts as a point of contact for the Galileo programme.

www.cz.esnc.eu

REGIONAL WINNER

SMART CITY

MoveLight: GNSS-enabled Platform for Light Personal Mobility

MoveLight will enable seamless integration of bicycles, self-balancing unicycles, hoverboards, and other light personal transporters (LPTs) into intermodal urban transport systems. The MoveLight Navigator app for smartphones and wearable devices will allow urban citizens to find and follow personalised routes that best fit the type of LPT and the context of the trip at hand. High-quality routes will be calculated by a unique behavioural routing engine that utilises advanced algorithms in combination with a variety of information, including crowdsourced sensor data and tracked routes recorded by the MoveLight Navigator app. The engine will also find intermodal routes that combine LPT travel with cars, taxis, or public transport. Rich data and specialised algorithms will power data-driven analytics on light mobility to help municipal authorities understand movement patterns, identify infrastructure bottlenecks, and determine ways to increase the uptake of LPTs. The MoveLight apps and services will rely on the accurate positioning enabled by the next-generation Galileo GNSS. They will build on the winners existing UrbanCyclers platform, which already delivers the envisioned MoveLight functionality for urban cycling.

contact winner

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Innotek

Innotek is a non-profit organisation that supports new business, start-up initiatives, and offers innovative companies flexible office and lab infrastructures in the cities of Geel and Mol. In doing so, Innotek seeks to contribute to the development of high-level employment in Flanders. iMinds, a partner of Innotek in the ESNC 2016, is an independent research institute that stimulates innovation on information and communication technology (ICT). This research is interdisciplinary and demand-driven, and takes place in close collaboration with both local and international businesses and governments. Its aim is to provide solutions to complex problems and thus help meet society's future challenges.

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REGIONAL WINNER

SMART CITY

Faver: Enabling Strangers to Do Each Other Favours for Rewards Based on Their Location

Faver is an app that brings the shareconomy to a new level by enabling a user who needs something from a certain location to obtain it remotely through another app user present in the area. Originally conceived as a research tool, Faver was meant to enable students to easily help each other out when a student from one university needed material from another student's university library. However, more broadly – and with a sufficiently large user base – this smartphone app could enable users to obtain whatever they might need from a certain location through an app user present in the area (determined through natively supported GNSS, such as GPS and GLONASS). In exchange for their kindness, helpful users could be rewarded with Karma Points™ that can be used to make their own requests or unlock extras in the app. Faver's initial aim is to provide an app that is truly "by and for students" combining its research potential and other uses in everyday student life, e.g. finding out whether there are still free spots left in the library, etc. The end goal is to make favours the new commodity in today's sharing economy while also making the world a friendlier place by rewarding kindness.

© Olivier Dinet

contact winner

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REGIONAL WINNER

ENVIRONMENT

Pokemon Biodiv – Discover and Preserve Biodiversity

Pokemon Biodiv is a mobile application for participatory science that helps citizens discover their environment in a fun way. Using location-based phone features, the game enables users to look for an animal or plant close by. Gamers are tasked with observing species in their surroundings to receive rewards and learn more about the species. They then are invited to share their observations with friends and scientists. New species and new missions are proposed constantly, giving gamers the chance to gain skills and become experienced explorers. The data gathered through the app will be used in participatory science projects and contribute greatly to environmental understanding. It will also raise awareness concerning nature and biodiversity: "Wonder is the first step toward respect, knowledge is the second one" (Nicolas Hulot). The customers will be local authorities that want to revitalise their area by valuing and tapping into its natural and cultural richness while continuously working to preserve it. The game is designed to complement a professional mobile app (MyENEO) for data collection in the field. It is part of a broader strategy to collect and use more data about biodiversity and the environment in an efficient way.

© Alex Wallace via Newgrounds

contact winner

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ESA BIC Sud France

The business incubator ESA BIC Sud France allows to promote entrepreneurship based on technology transfer from the spatial domain to other domains and the development of services and applications from space technologies. ESA BIC Sud France, created in 2013, is managed by Aerospace Valley in close cooperation with SAFE cluster and the French Space Agency in Toulouse (CNES). It is run by structures that support the creation of innovative companies in Aquitaine, Midi-Pyrénées, Languedoc-Roussillon and Provence-Alpes-Côte d'Azur, including ESTIA Entreprendre, Bordeaux Technowest, CEEI Theogone, Midi-Pyrénées Incubator, PACA-Est Incubator and Montpellier Incubator. ESA BIC Sud France itself, provides valuable instruments for encouraging entrepreneurs to promote and exploit existing space-related patents.

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Vigo Free Trade Zone Consortium

Galicia, one of Spain's 17 autonomous regions, has an area of 29,500 square kilometres and more than 2.5 million inhabitants. The region is a hotbed of education and innovation. It is home to three universities and a large number of nationally acclaimed R&D centres involved in forestry, marine, automotive, shipbuilding, mining, wind, hydroelectric energy, food and agriculture. The Vigo Free Trade Consortium is a public institution that has been working to encourage international trade and economic development in Galicia since 1947. As an economic development agency, they not only serve as the main developer of business parks in its area of influence, but also provide companies with a full range of services. In 2010, the network of parks in Vigo's free trade zone generated 26.57% of the total wealth of the Vigo Metropolitan Area and 25.56% of all employment in the region.

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GALICIA / SPAIN

REGIONAL WINNER

UAV

GNSS-Assisted Drone Landing System

This system will help to land a drone with accuracy and precision under extreme conditions – on a small floating platform like a ship at sea, for example, or under low-visibility conditions at night or in the presence of fog or smoke. The system will use signals transmitted from GNSS satellites to measure the distance and relative speed from the drone to the landing point. While this system could also be useful in connection with any airplane or helicopter, it is especially suitable for drones: It is a small, light, low-power system that can be carried entirely by the drone. In other words, no equipment needs to be deployed at the landing point. This robust, reliable, and precise system will increase the safety of drones. Furthermore, it will expand the circumstances in which drones can be used, as well as the range of applications they support. These include situations such as fire-fighting, rescues at sea, and other challenging settings both during the day and at night.

contact winner

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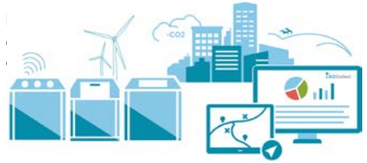
HESSE / GERMANY

REGIONAL WINNER

ENVIRONMENT

ISOCollect: Predictive Waste Collection Optimisation with Innovative Fill-Level Monitoring & Smart Routes

Collecting waste and recyclable materials like glass is a process that involves big trucks and generates large amounts of carbon dioxide, nitrogen oxide, respirable dust, noise, and congestion in urban areas. Such emissions could be measured and reduced through the use of ISOCollect, a predictive waste management solution from Isofleet. ISOCollect measures the fill level of each waste container and forecasts the best time for emptying to ensure profitability and cleanliness using a combination of live sensor data and historical/contextual information. Furthermore, one container in each location will be equipped with GNSS/GSM functionality as a reference for location based services. ISOCollect automatically calculates optimal collection routes and guides drivers through a user-friendly app. With ISOCollect, waste and recycling containers are converted into smart containers that continuously monitor their fill levels along with other parameters and send the data to the cloud for processing. ISOCollect combines all containers (paper, glass, textiles, etc.) in an innovative way using a mesh of self-learning, battery-powered GNSS sensors.



contact winner

ISOFLEET ISOCollect proven collection, smart routes

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Centre for Satellite Navigation Hesse (cesah)

The ESA Business Incubation Centre (BIC) Darmstadt is managed by cesah. Located in the vicinity of the European Space Operations Centre (ESOC), cesah supports the development and marketing of business ideas and start-up companies in the satellite navigation domain. cesah is supported by Hessen-IT, a programme of the Hessian Ministry of Economic Affairs that supports the Hessian information and communication technology (ICT) sector in its market development, as well as SMEs in their efficient and creative use of ICT.

www.hesse.esnc.eu

organised by

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National Space Centre

Supported by a highly skilled workforce, Ireland's knowledge-based economy and strong technology sector have given the country the highest concentration of ICT activity and employment in the OECD. Ireland's ICT sector also attracts global investment, with seven of the world's top 10 companies now operating from the country. ICT also accounts for EUR 50 billion in Irish exports. The National Space Centre, located in the South of Ireland, is Ireland's only teleport. It is involved in emerging satellite technology projects – including the development of S-AIS and marine mapping projects with ESA – and has provided technical support services for the Galileo satellite programme.

www.ireland.esnc.eu

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IRELAND

REGIONAL WINNER

AGRICULTURE

I.O.T.A.P., the Internet of Things and People by Farmflo

Farmflo's goal is to develop the next generation of farm management software that integrates modern precision technology into a single platform to automate the collection of data in the farm in real-time. This collective data set will allow the farmer to view the data across their entire farm enabling them to make the data driven decisions to improve performance and profitability. Farmflo is utilising GNSS to ensure accurate data capture and analysis where internet connectivity is poor or non-existent. It aims to end the reliance on pen-and-paper data collection, analysis based on Excel sheets, and desk-based software systems. Although the transfer of knowledge from research into farming practices has proven to be slow and difficult globally, Farmflo presents farm-specific, user-friendly insights and decision prompts in real-time via smartphones or other mobile devices. This means farmers are more likely to act on the available information. Thanks to data enrichment functions that leverage GNSS location data to focus on primary food producers, expert advisors, and farmers' customers, Farmflo can help farms achieve input savings, increase their commercial resilience, and benefit their surrounding rural communities.

contact winner

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ISRAEL

Optibus OnTime™ – Reacting to Bus Delays BEFORE they Impact Passengers

Optibus OnTime™ is a unique cloud-based solution that helps public transportation operators address problems that trigger bus delays before they impact passengers. Unexpected bus delays caused by traffic jams, special events, car accidents, and other disruptions happen on a daily basis. Since buses are scheduled to perform multiple trips per day, every such delay creates a snowball effect on the following trips, negatively impacting more and more passengers. At present, no solution actually solves this problem in real-time other than by using reserve buses, which is very costly and may not comply with scheduling rules. Optibus OnTime™ predicts such delays and enables operators to assign affected trips to other drivers. By using GNSS data, the solution constantly tracks each busses location, validating that it is on time, according to its original schedule. If not, it will alert the operator and provide options to overcome the problem in real-time by creating adjusted schedules that are cost-effective and still comply with all of the predefined preferences, constraints, and regulations at hand. Optibus OnTime™ uses Optibus's unique Optibize™ technology (patent pending). Developed for the transportation industry, Optibize™ is a revolutionary real-time technology that performs super-fast optimisation of vehicles and driver schedules while factoring in an unlimited number of preferences, constraints, and regulations.

contact winner

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Israel-Europe R&D Directorate (ISERD)

Israel is a world leader in national investment in R&D. Its expenditures accounted for 4.4% of its GDP in 2011, placing it ahead of countries such as the UK, the US, Japan, and Sweden. The country also represents a unique blend of academic excellence, scientific innovation, and entrepreneurial experience in basic and applied research across the various stages of product development. ISERD is an inter-ministerial directorate operated through Israel's Ministry of Economy that promotes the participation of Israeli entities in R&D ventures within the European Research Area. It operates through various channels, such as HORIZON 2020, Eureka, binational programmes, EEN, and endeavours co-funded by Israel and the EU. In the European Commission-funded EGNIS project, ISERD serves as the European GNSS coordinator for Israel.

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LITHUANIA

Agency for Science, Innovation and Technology (MITA)

Lithuania, situated on the East coast of the Baltic Sea, boasts a rich history, unique traditions, Eastern Europe's oldest university, a highly educated workforce, and the highest mobile-phone penetration and densest broadband internet coverage in Europe. Lithuania promotes R&D in biotech, lasers, ICT, nanotech, mechatronics & electronics. The Ministry of Economy of the Republic of Lithuania is responsible for developing a legal and economic framework boosting economic development; it ensures public welfare and employment. Its tasks include the promotion of innovation, SME development, the administration of EU structural funds, the country's space policy, etc.

www.lithuania.esnc.eu

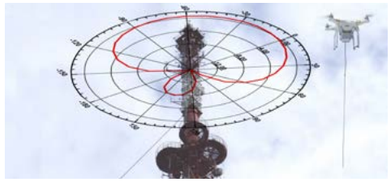
REGIONAL WINNER

UAV

© V. Mongavicius

Electromagnetic Compatibility Measurements Using Very Light Hardware on a Drone

Professional antenna systems can be complex structures. To reduce the risk of installation errors and failed projects, it is important to know whether a system meets the expected parameters. Meanwhile, such parameters can also degrade over time. One of the most important parameters with regard to electromagnetic compatibility is the radiation pattern of an antenna. Using ground-based equipment, measuring these patterns poses a serious challenge. One conventional but expensive solution is to take measurement equipment skyward using helicopters. Attempts have also been made to use heavy drones to measure radiation patterns, but no hardware/software providers have entered the market. A team at Vilnius University has developed very lightweight and very low-cost equipment for small drones using a standalone device concept (featuring GNSS and RTL SDR receivers, computers, power supplies, and communication modules). No additional electrical connections to the drone are required. It weighs only 200 g and is compatible with the cheap and popular DJI Phantom drone. This equipment is expected to make important measurements like these accessible not only to professionals, but to radio amateurs, as well.



© Saulius Rudys

organised by

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MADRID / SPAIN

madri+d Foundation

The Madrid region represents the primary hub of Spanish industry, research, and education in the aerospace sector. It accounts for around 92% of the country's aerospace activity, both in terms of direct employment and turnover. The Madrid region is also home to a large number of public and private universities and boasts Spain's highest level of investment in R&D. The madri+d Foundation, meanwhile, supports the creation and early consolidation of new technology-based firms. Since 2002, it has supported 460 newly founded firms, which have generated more than EUR 150 million in total turnover and directly created more than 2,800 highly skilled jobs. In its various endeavours, madri+d works very closely with its network of university, incubation science, and entrepreneurial institutions.

www.madrid.esnc.eu

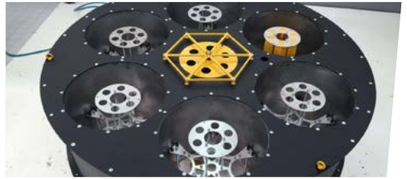
REGIONAL WINNER

UAV

© kasto80 iStockphoto

DRONE HOPPER – Extinguishing Wildfires, Spraying Crops

DRONE HOPPER's mission is to design, manufacture, and operate semi-autonomous drones capable of extinguishing wildfires and supporting agricultural operations. These fire-fighting drones can release up to 300 litres of water precisely (thanks to EGNOS) onto a fire from just a few metres above the terrain. The release method is one of the main innovations: It is based on a patented technology that uses air from the engines to produce a jet of water mist capable of removing oxygen from the combustion reaction, which puts out the fire using very small quantities of water. This very efficient operation enables DRONE HOPPER to outperform conventional platforms that carry larger quantities of water. In agricultural operations, the drones meet virtually every possible need, ranging from focused pest control and precision fertilisation to extensive spraying and pest prevention. In addition, the precise delivery of substances helps avoid the contamination of neighbouring crops and keeps the amounts used to a minimum. Agricultural operations will start in Q4 2016, while the drones' fire-fighting debut is planned for Q4 2017.



contact winner

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fundación para el conocimiento madrid

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THE NETHERLANDS

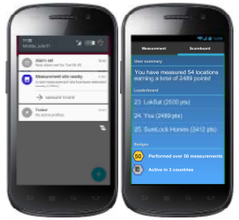
The Netherlands Space Office (NSO)

The Netherlands Space Office (NSO) was established by the Dutch government to develop and implement its country's long-term space programme. In addition to serving as the Dutch space industry's representative in international space organisations like ESA and NASA, NSO forms the central point of contact for the space community within the Netherlands. Moreover, NSO also seeks to educate the general public – and specifically students and teachers – about space (science, applications, and exploration) in an open and innovative manner. Finally, NSO invests in programmes that foster the commercial market for applications based on the utilisation of space data.

www.nl.esnc.eu

Crowdsourced Surface Elevation Mapping Through Gamification

Flooding is a major global problem. In Bangladesh, for example, flooding causes 5,000 deaths each year. In order to properly assess flood risks, an accurate surface elevation map is needed. Unfortunately, this is not available in most countries, as sending surveyors to measure an entire country is too expensive and satellite measurements are not accurate enough. The idea is to create an app that uses the mass availability of GNSS sensors in smartphones to improve the surface elevation datasets currently available. By creating a game that stimulates users to go out and send measurements, it will generate large sets of GNSS measurements. These measurements will be combined with current datasets and satellite measurements to provide a digital elevation model with more accurate surface elevation mapping. This improved elevation mapping will allow governments and other interested parties (research agencies, utility companies, etc.) to mitigate risks and perhaps even save lives. It will also save governments money by enabling them to outsource the updating and maintenance of elevation maps.



organised by

Netherlands Space Office

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contact winner

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NORWAY

Norwegian Space Centre

The Norwegian Space Centre (NSC) is a government agency under the Ministry of Trade and Industry. Its mission is to ensure that Norway benefits as much as possible from its space activities. NSC's areas of focus include activities in which Norway can compete in the global market for space-related goods and services, and which to a great degree are based on national qualifications and needs. In addition to promoting the development, coordination, and evaluation of the country's space activities, NSC supports Norwegian interests through the European Space Agency (ESA). Norway's participation in the EGNOS and Galileo programmes is also actively managed by NSC.

www.norway.esnc.eu

BIRDEYE – Visual UAV Communication / Pilot Support with Integrated Satellite Navigation and Networking

The world has only begun to use unmanned aerial vehicles (UAVs) for critical civilian operations like search and rescue, security, and disaster management. Meanwhile, Galileo satellite navigation is essential to safe autopilot operations and reliable communication. BIRDEYE offers solutions needed to optimise mission-critical long-distance communication of images and video from UAVs over multiple satellite- and ground-based radio networks. Cellular networks have no 3D coverage maps that express signals as a function of height. Moreover, operations can take place where there is limited or no terrestrial coverage. BIRDEYE will thus use GNSS to ascertain and manage critical networking while providing novel visual communication solutions. BIRDEYE will also provide UAV pilots with GNSS-related information on signal authenticity, jamming and spoofing, and phenomena that affect operations (such as solar storms). In addition, BIRDYE provides operational locations and maps them in an online portal to produce an overview of who is flying when and where. This also offers a means of communicating with pilots about flight management, awareness, and safety.

contact winner

ansur birdeye

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organised by

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Blue Dot Solutions

Poland is one of the biggest markets for IT, mobile, transport, and entertainment products and services in the European Union. It has a very vibrant investment scene with an increasing interest in funding new applications and technological solutions. Having joined the European Union in 2004 and become a European Space Agency (ESA) member-state in late 2012, Poland is now in a position to realise, fund, or co-fund several space-related programmes. Blue Dot Solutions (BDS) Ltd. is a Polish space-sector SME that provides a broad range of engineering, B2B, and consulting services to the Polish space sector. The services are mostly related to projects conducted for ESA, the European Investment Bank (EIB), and the European Commission. BDS owns the biggest Polish website dedicated to space news, named Kosmonauta.net.

www.poland.esnc.eu

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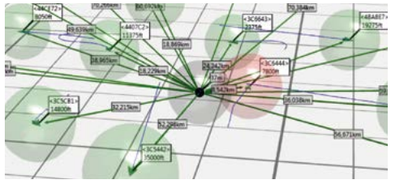
POLAND

REGIONAL WINNER

SAFETY & SECURITY

Safe Airspace Sharing Between Manned and Unmanned Airborne Vehicles

In 2015 alone, four million drones were sold for civilian use. This new market presents enormous opportunities, but also significant hazards. The scale of the problem is easy to see in press publications and Federal Aviation Administration (FAA) reports. Over a hundred hazardous drone approaches to manned aircraft are recorded every month solely in the USA. It is already clear that the law itself will not be enough to ensure safe airspace sharing between manned and unmanned aircraft. Experts are increasingly calling for the introduction of electronic systems with SAA (sense-and-avoid) technology, which guarantee a safe distance once installed on the UAV's side. The solutions Aerobits provides are currently the smallest in the world that integrate Automatic Dependent Surveillance – Broadcast (ADS-B)/GNSS technologies with user-friendly interfaces. Their mutual core consists of receiving and decoding functions for ADS-B/GNSS signals, which makes it possible to identify all manned aircraft in the direct vicinity of a given UAV. Gaining better awareness of current airborne activity is the right way to improve the safety of UAV operations.



contact winner

Aerobits

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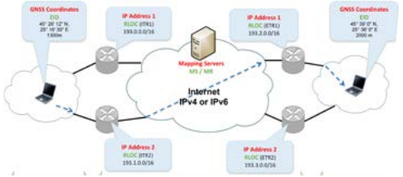
ROMANIA

REGIONAL WINNER

SMART CITY

AwareAnywhere – Nowcasting and Localised Response Force Mobilisation

AwareAnywhere is a mobile application that can be used for notifications, alerts, assistance, and resource mobilisation based solely on GNSS coordinates. Current addressing possibilities are limited to an identifier (an email address, phone number, IP address, etc). The team behind AwareAnywhere has proposed an innovative method of contacting someone without knowing or exchanging any identifier; it works when the user knows only the recipient's location (GNSS coordinates) and finds them by simply picking a point or area on a map. AwareAnywhere is geared towards governmental institutions responsible for public safety, as well as city authorities and mobile operators. It also represents a nowcasting application (for emergency notifications, urgent weather reports, political events, terrorist attacks, etc) that facilitates localised responses (assistance via voice calls, communication of additional information, mobilisation of relevant human or non-human resources nearby, etc) through unique features made possible by the new method of using the existing LISP (Locator/Identifier Separation Protocol) without the need for any changes in the IP network or Internet infrastructure.



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contact winner

AwareAnywhere

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Romanian Space Agency

Established in 1991 and reorganised in 1995 as a public institution within Romania's Ministry of National Education, the Romanian Space Agency (ROSA) develops the National Space Programme and coordinates its implementation through research projects and space applications. It also has the authority to establish its own research and development centres. Meanwhile, ROSA serves as the lead organisation of the Programme for Research, Development and Innovation STAR (Space Technology and Advanced Research) and represents the Romanian Government in international cooperation programs such as the European Space Agency (ESA), the United Nations (UN) and the North Atlantic Treaty Organisation (NATO). Led by Dr Phys Marius-Ioan Piso, president of ROSA since 2004, the agency carries out its own research and development projects through the ROSA Research Centre.

www.romania.esnc.eu

organised by

rosa

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Future Position X

Future Position X is one of Europe's leading cluster organisations and a well-known and attractive global centre for innovation in adaptation of geographic information technologies for the smart city and individual health. At present, more than 200 companies and organisations are working together within the cluster. Future Position X is based in the Gävle region in Sweden – known as a centre for research and education in the field of mapping. It runs an internationally recognised cluster within geographic information where knowledge and excellence breed innovation and business development. It provides an exciting environment that boosts innovation and generates internationally competitive companies. Thereby, Future Position X aims at helping enterprises and organisations to research and develop new products and solutions and expand to new markets.

www.sweden.esnc.eu

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SWEDEN

REGIONAL WINNER

INDUSTRY APPLICATION

Positioned Production and Management

This Invotech solution will accelerate the business digitalisation of companies in the industrial sector and make significant progress towards introducing Industry 4.0. Using indoor/outdoor positioning, it constructs a virtual warehouse space and collects precise information on material or production flows – to provide decision support based on algorithms. To facilitate easy implementation, the solution will also be capable of interacting with existing support systems. Invotech has incorporated a miniature GPS-aided inertial navigation system and AHRS (Attitude and Heading Reference System) to provide accurate data on position, velocity, acceleration, and orientation under the most demanding conditions. It combines temperature-calibrated accelerometers, gyroscopes, magnetometers and a pressure sensor with an advanced GNSS receiver that supports vertical positioning accuracy (through DGNSS). Invotech wants to promote transparency in the material flows that take place both in- and outdoors. The focus is on industrial digitalisation, where location plays a significant role.

contact winner

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SWITZERLAND

REGIONAL WINNER

SAFETY & SECURITY

SPREE: A Spoofing-Resistant GNSS Receiver

GNSS is critical to a large set of applications ranging from autonomous cars to smart grid infrastructures. GPS, today's de-facto outdoor localisation system, is vulnerable to signal spoofing attacks. It is currently possible to change the course of a ship or force a drone to land in a hostile area simply by spoofing GPS signals. The team behind SPREE has introduced the first GNSS receiver that is capable of detecting all known spoofing attacks. SPREE implements novel signal tracking and decoding algorithms that prevent even a strong attacker from being able to spoof the receiver more than 1 km away from its true location. This is a significant improvement over state-of-the-art receivers, which can be spoofed to any arbitrary location in the world, potentially resulting in millions of dollars in assets lost for a company.

Potential customers include maritime and military operators, smart grids, and autonomous automobile manufacturers. PRS customers can also leverage the solution to secure their infrastructures against spoofing attacks. In addition, SPREE can be deployed directly on current GNSS receivers with a simple firmware upgrade, thus reducing the deployment cost to a minimum.

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contact winner

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swiss aerospace cluster

The swiss aerospace cluster is an agile network and non-profit organisation for pooling information across companies and organisations, thereby increasing development potential and promoting innovative products. Switzerland ranks first among 125 economies in terms of innovation levels (Global Innovation Index 2011). The cluster's members include academic and research organisations, as well as companies in the field of aerospace technologies, such as satellite navigation. The cluster supports access to attractive future markets and boosts the competitiveness of the industry and research in Switzerland.

www.switzerland.esnc.eu

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The Satellite Applications Catapult

The Satellite Applications Catapult is a new type of independent innovation and technology company, created to foster growth across the economy through the exploitation of space. Catapult helps organisations to make use of and benefit from satellite technologies, and bring together multi-disciplinary teams to generate ideas and solutions in an open innovation environment. Their world-class facilities and expertise enable the best businesses, researchers and end-users to work together to develop new satellite-based products, services and applications, translating ideas from concept to market. The involvement of the Catapult has allowed the UK to boost the business support provided to all entrants, and vastly expand on the range of available programmes such as fora for investor readiness, ideas accelerators and business breakfast clubs.

www.uk.esnc.eu

organised by

CATAPULT Satellite Applications

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UNITED KINGDOM

OVERALL WINNER

REGIONAL WINNER

UAV

GNSS-based UAV Monitoring System for Airfields using Passive Radar Observations (GUAPO)

The use of Unmanned Aerial Vehicles (UAVs) is rapidly increasing. Companies are recognising the potential of UAVs for business applications, and as the cost of the technology decreases, UAVs are becoming more attractive to the leisure market. As a greater number of UAVs take-off, it is proving difficult to control their deployment in the air space, and authorities are concerned that their rapid uptake poses a significant risk to safety and security. To enable the early detection, classification and tracking of UAVs, a team from the University of Strathclyde has developed GUAPO, a Passive Bistatic Radar (PBR) system based on GNSS. The aim is to monitor sensitive areas such as restricted air spaces around airfields but the system could also be deployed for major public events or to support UAV use for e-commerce. A PBR system exploits existing sources of electromagnetic illumination to accomplish radar tasks such as detection, parameter estimation and recognition. This sensor family is attractive due to the continuous coverage it can deliver and the low resource requirements making the system very cost-effective. The team has developed and tested the technology and are now commercialising the idea.

contact winner

GUAPO

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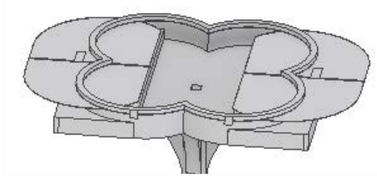
VALENCIAN COMMUNITY / SPAIN

REGIONAL WINNER

UAV

Handling Stations Network for UAS Applications

The main purpose of InSat Drone is to support UAV flight and provide essential maintenance services through a network of stations. Current unmanned areal systems (UAS) applications require the involvement of different technicians in order to succeed. InSat Drone guarantees the accomplishment of all kinds of UAS operations in a completely autonomous and continuous way. Each station of a network will charge the vehicles wirelessly and provide for safe storage. The network design, including UAVs and stations, will be adaptable to specific requirements depending on the mission at hand. All these services will be conducted under the supervision of the network control centre. InSat Drone will thus provide "handling services" to UAVs just as airports do with planes. Private companies and public entities will be able to take advantage of this network. Guidance for people, freight transport, and surveillance are just a few examples of possible applications. At this moment, InSat Drone is possible due to EGNOS, which provides information on UAV's positions and enables their navigation between stations. Galileo will improve the system by facilitating critical operations such as landing, take-off, and approach.



contact winner

InSat Drone

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Val Space Consortium

Boasting an excellent communications network, modern infrastructure, quality industrial land, and skilled entrepreneurs, the three provinces of Valencia, Castellon, and Alicante offer an ideal place for companies to settle and grow. Val Space Consortium was created in 2010 to combine all of Valencia's efforts in the space sector and increase their impact and international competitiveness. Composed of Generalitat Valenciana, the city administration of Valencia, Universitat Politècnica de València, and Universitat de València Estudi General, it performs scientific research and renders technological development services in space-related fields. Through collaborations with the European Space Agency (ESA) and other Spanish and international institutions, the consortium promotes activities and provides services designed to facilitate European space development.

www.valencia.esnc.eu

organised by

VSC VAL SPACE CONSORTIUM

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MEDIA PARTNERS

The ESNC in the spotlight

We want to express our appreciation to the GNSS magazines and stakeholders active in space-related fields who support the ESNC as media partners. Along with our extensive marketing activities, they are essential parts of spreading the message about the unique opportunities to entrepreneurs and innovators all across the world.

ESNC Website (2015)

1,040,816 PAGE VIEWS
www.esnc.eu

>60 EVENTS

Regional Kick-off events
University Challenge workshops
European Space Solutions
Further Conferences

>600 PUBLICATIONS IN SPECIALISED PRESS

ESNC SOCIAL MEDIA CHANNELS

YouTube · AZO • Blog

>160 MULTIPLIERS

Most releveant European GNSS Stakeholders

8 TOPIC RELATED NEWSLETTERS

>4,000 Specialised contacts (each)

>20,000 MAILING RECIPIENTS

GNSS-related contacts
Specific GNSS multipliers
(Potential) participants

12 MEDIA PARTNERS

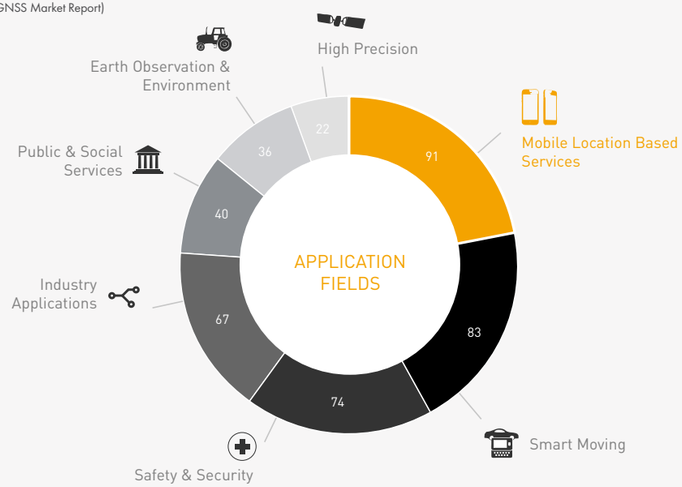
Become a media partner for 2017.
Contact matthias.engler@azo-space.com

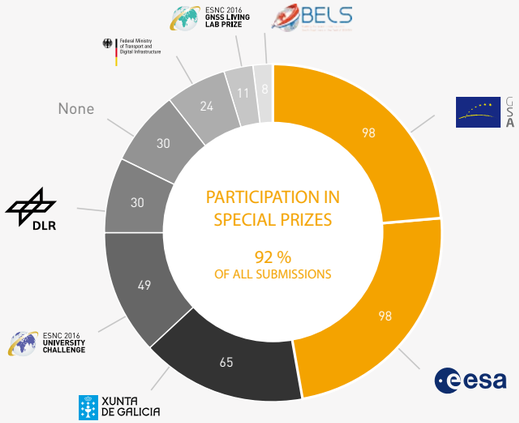
STATISTICS

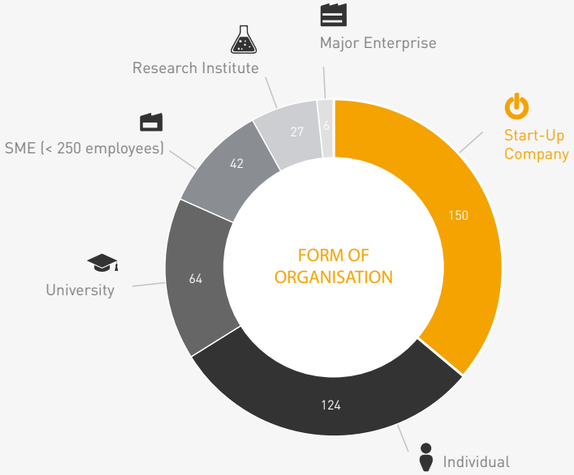
Exploiting the growth market of GNSS

This year's edition of the ESNC recorded a remarkable result of 413 entries and reached entrepreneurs from over 40 different countries. More than 10,000 entrants have submitted 3,756 business cases over the past 13 years, which has helped to exploit a growing market expected to reach a volume of EUR 250 billion.*

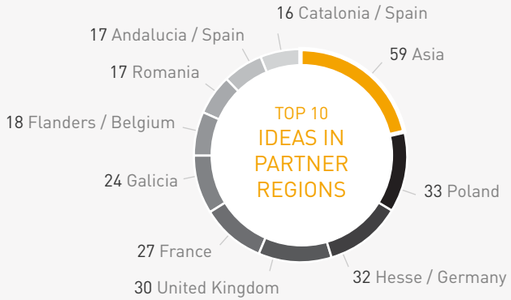
*Per year by 2022 (European GNSS Agency 2015 – GNSS Market Report)

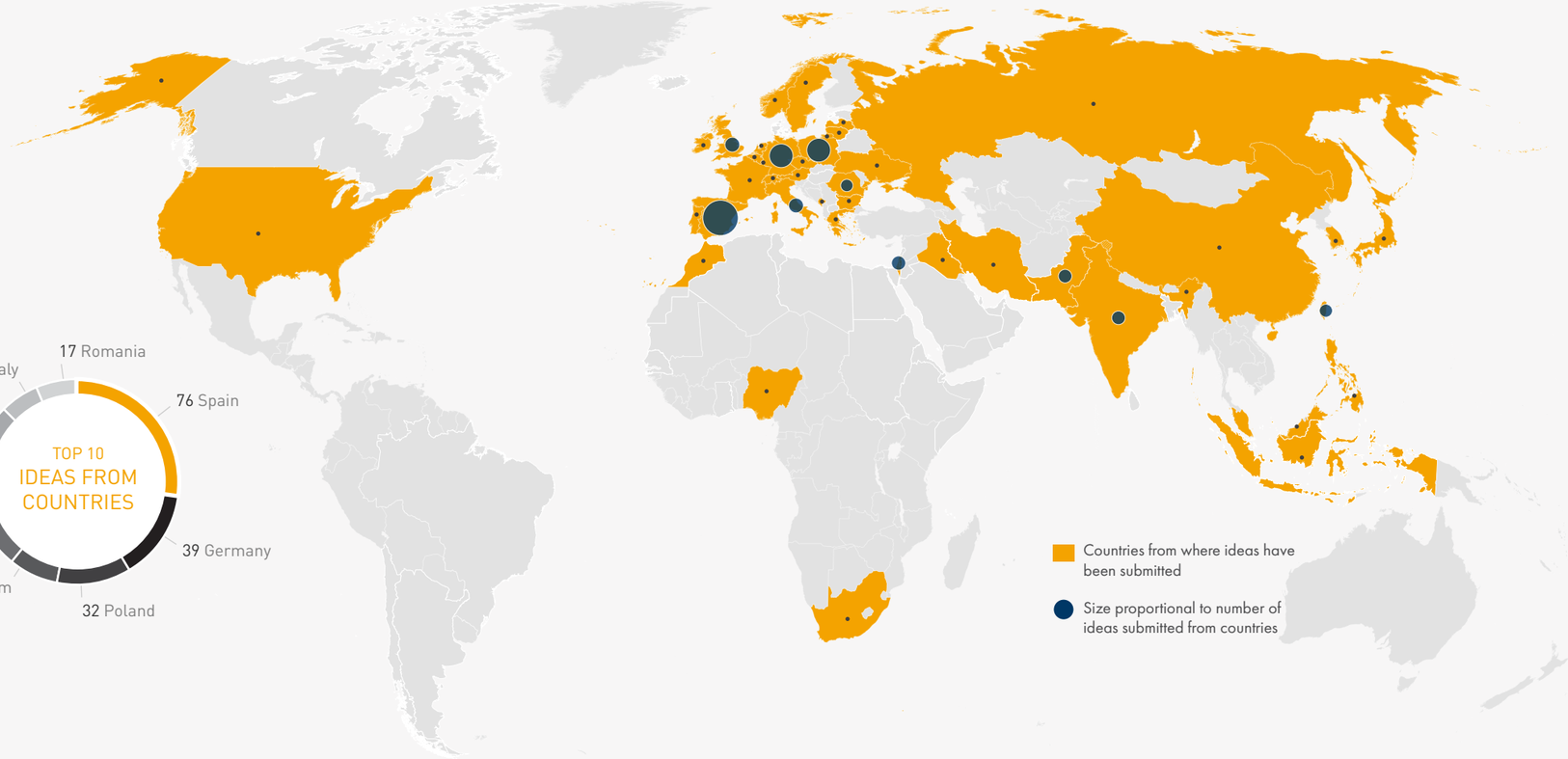






CROSS-REGIONAL IMPACT





EXPERTS

Unique SPACE-alists value entrepreneurs

Within the past 13 years, the ESNC has grown into an exceptional international network of space innovation and expertise. More than 250 international experts from the realms of industry, research and politics contribute to this huge knowledge pool. Their most important task is to evaluate the ideas submitted and detect new key future technology trends.

European GNSS Agency (GSA)

Ms Katerina Strelcova	European GNSS Agency (GSA)
Mr Vojtech Fort	European GNSS Agency (GSA)
Mr Flavio Sbardellati	European GNSS Agency (GSA)
Mr Martin Sunkevic	European GNSS Agency (GSA)

European Space Agency (ESA)

Mr Marek Aldorf	ESA BIC Prague
Mr Martin Mössler	ESA BIC Austria / Science Park Graz GmbH
Dr Thomas Bouvet	European Space Agency (ESA)
Mr Carlos Cerqueira	ESA BIC Portugal
Mr Erik Degroof	Innotek / ESA BIC Flanders
Mr Armen Derderian	European Space Agency (ESA)
Mr Matthew Edwards	ESA BIC Harwell
Mr Niels Elderling	European Space Agency (ESA)
Mr Jorge Fuentes	ESA BIC Barcelona
Ms Sue Ohare	ESA BIC Harwell
Mr David Gibbons	ESA BIC Ireland
Mr Roberto Giuliani	ESA BIC Lazio
Ms Ines Placido	ESA BIC Portugal
Mr Herve Joumier	European Space Agency (ESA)
Mr Martijn Leinweber	ESA BIC Noordwijk
Mr Fabian Lindermer	ESA BIC Bavaria
Mr Jens Lundström	ESA BIC Sweden
Mr Bruno Naulais	European Space Agency (ESA)
Ms Aude Nzeh Ndong	ESA BIC Sud France
Mr Guillermo Ortega	European Space Agency (ESA)
Mr Carlos Romero	ESA BIC Madrid
Dr Frank Zimmermann	ESA BIC Darmstadt

German Aerospace Center (DLR)

Dr Rolf-Dieter Fischer	German Aerospace Center (DLR)
Mr Robert Klarner	German Aerospace Center (DLR)
Mr René Kleeßen	German Aerospace Center (DLR)
Prof Michael Meurer	German Aerospace Center (DLR)
Mr Walter Päffgen	Gesellschaft für Raumfahrtanwendungen (GfR) mbH
Dr Klaus-Dieter Rockwitz	German Aerospace Center (DLR)

German Federal Ministry of Transport and Digital Infrastructure (BMVI)

Mr Kai Herrmann	Federal Ministry of Transport and Digital Infrastructure (BMVI)
Mr Rainer Horn	SpaceTec Partners
Mr Norbert Frischauf	SpaceTec Partners
Ms Sandra Karger	Federal Office for Information Security (BSI)
Mr Robert Klarner	German Aerospace Center (DLR)
Mr Miroslav Kuridza	Bundeswehr Technical Centre (WTD) 81
Mr Hendrik Osenberg	German Aerospace Center (DLR)
Mr Alexander Rügamer	Fraunhofer IIS
Dr Michael Scharnberg	Federal Ministry of Economic Affairs and Energy (BMWi)
Mr Lukas Schmid	Federal Ministry of Transport and Digital Infrastructure (BMVI)

UAV Special Prize

Mr Isaac Ballesteros	Centum Solutions
Mr Francisco J. Diaz-Otero	University of Vigo
Dr Antonio Rodriguez Rodriguez	Galician Innovation Agency (GAIN)
Dr Javier Ventura-Traveset	European Space Agency (ESA)
Mr Miguel Álvarez	AtlanTIC Research Center, University of Vigo
Mr Joaquin Garcia Lopez	Xunta de Galicia

BELS Special Prize

Ms Bärbel Deisting	bavAIRia e.V.
Ms Anne Christine Escher	French Civil Aviation University (ENAC)
Ms Letizia Lopresti	Polytechnic University of Turin (POLITO)
Ms Gabriella Povero	Istituto Superiore Mario Boella (ISMB)
Prof Chris Rizos	University of New South Wales (UNSW)
Dr Jaume Sanz Subirana	Technical University of Catalonia (UPC)

University Challenge

Mr Paul Bhatia	University of Nottingham (UNOTT)
Dr Fabio Dovis	Polytechnic University of Turin (POLITO)
Mr Christophe Macabiau	French Civil Aviation University (ENAC)
Ms Kristina Kudlich	Universität der Bundeswehr München (UniBwM)
Dr Jaume Sanz Subirana	Technical University of Catalonia (UPC)
Mr Matteo Vannucci	Istituto Superiore Mario Boella (ISMB)

GNSS Living Lab Prize

Mr Juan Antonio Bertolin	ESPAITEC
Dr Stavri Nikolov	Digital Spaces Living Lab (DSLL)
Mr Per-Olof Sjöberg	Swedish Institute of Computer Science (SICS)
Prof Charles Tijus	IUL LUTIN Userlab

Aandalucia / Spain

Mr Sergio Fortes	University of Málaga (UMA)
Mr Pedro Lázaro Legaz	University of Málaga (UMA)
Dr Adolfo Linares Rueda	University of Málaga – Technology Transfer Office
Mr Fernando Marín Ocaña	Estudio De Ingeniería Lynka, S.L.
Prof Dr Teresa M. M. Guerrero	University of Málaga (UMA)
Mr Mariano Morán Prados	Promálaga
Ms Natalia Pérez Pérez	Andalusia Technology Park (PTA)
Mr Pedro Pablo Sanchez	AERTEC Solutions
Dr Rafael Ventura Fernández	University of Málaga (UMA)

EXPERTS

Asia

Dr Wan Sik Choi	KGS
Mr Steve Hsu	Tronxin Accelerator
Mr Varadarajan Krish	European Business Group India (EBGI)
Mr Yasushi Sakurai	Satellite Positioning Research and Applications Center (SPAC)
Mr Thomas Tanghe	SpaceTec Partners
Mr Yi Fen Tseng	HED / GNSS Business Div

Austria

Ms Elisabeth Fischer	Austrian Research Promotion Agency (FFG)
Mr Christian Gaisbauer	Federal Ministry of Transport, Innovation & Technology (BMVIT)
Mr Martin Mössler	ESA BIC Austria / Science Park Graz GmbH
Dr Thomas Nennadal	Accent Gründerservice
Prof Dr Robert Weber	Vienna University of Technology
Prof Dr Manfred Wieser	Graz University of Technology

Baden-Württemberg / Germany

Dr Stefan Engelhard	Chamber of Industry and Commerce (IHK) Reutlingen
Mr Dieter Geiger	ITS Network Germany
Dr Carsten Günther	Heidelberg Mobil International GmbH
Prof Dr Reiner Jäger	Karlsruhe University of Applied Sciences (HSKA)
Mr Ralph Zimmermann	Ministry of Finance and Economy Baden-Württemberg
Mr J. Marius Zöllner	Research Center for Information Technology (FZI)

Basque Country / Spain

Mr Pedro Sanchez	IKUSI (Velatia Group)
Mr Jesus Marcos Olaya	Tecnalia
Mr Pablo Martinez Muñoz	BIC Gipuzkoa
Dr Oihana Otaegui	VicomTech-IK4

Bavaria / Germany

Mr Markus Bachleitner	General German Automobile Club (ADAC e.V.)
Prof Stefan Bindl	EOS Electro Optical Systems
Prof Dr Werner Enderle	European Space Agency (ESA)
Mr Klaus Herrig	Garmin Würzburg
Mr Lars Holstein	Economic Development Office Berchtesgadener Land (WFG BGL)
Mr Josef Kolbinger	Kolbinger Consulting
Dr Günter Rohmer	Fraunhofer IIS
Mr Peter Seige	Seige Consult
Mr Harald Wagner	BayStartUp GmbH
Dr Daniel Westenberger	LKGLOBAL

Catalonia / Spain

Mr Xavier Alabart	Aether Consulting
Mr Javier Arribas	Telecommunications Technological Center of Catalonia (CTTC)
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