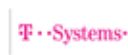




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7<sup>th</sup> Edition

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## COPERNICUS MASTERS INTRO 2017

Six years ago, together with our world-class partners, we launched the Copernicus Masters as part of our mission to foster User Uptake of the Copernicus programme as well as to look at our planet and its environment for the ultimate benefit of all European citizens.

The satellites now in orbit – including the recently launched Sentinel-5P as well as Sentinel-2B in March 2017 – reinforce this benefit, to monitor our Earth and its ecosystems, so that all of us are prepared and protected in cases of natural disasters or man-made crises.

Today, with its 14 challenges and 487 participants from 40 countries, the Copernicus Masters competition affirmed the importance of Earth observation (EO) in virtually every sphere of our daily lives. This is reflected in the areas that attracted the most submissions: Small satellites (20%), agriculture & forest management (18%) and environment protection & climate (11%). Other fields producing innovative ideas for value-added services include emergency & security management, regional planning & urban management as well as public health management and renewable energies.

My thanks go to our dedicated partners who hosted the topic-specific challenges of the 2017 Copernicus Masters edition: The European Space Agency (ESA), the European Commission (EC), the German Aerospace Center (DLR), T-Systems

International GmbH, Stevenson Astrosat Ltd., CGI Group, the German Federal Ministry of Transport and Digital Infrastructure (BMVI) and Satellite Applications Catapult Ltd.

I am also very thankful this year for more than 70 international experts from industry, research, and politics who were entrusted with the evaluation of all submitted entries from July till September. Additionally, I am very grateful for all mentors of the Copernicus Accelerator programme – funded by the EC – who ensure customised business development support for 50 Copernicus Masters finalists this year. EO, its data and application fields are of tremendous value to the European society and economy. This calls for forward-thinking innovators to constantly strive for the most unique business cases. That's why, I would like to especially congratulate all the participants and winners of the Copernicus Masters 2017 and wish them the best of success with their business cases.

I am already very much looking forward to the next year(s) of the competition! In times of technology convergence, sharing economy – also in space – and Internet of Things (IoT), it will be exciting to see if block chain innovations for micro transactions will be added into upcoming ideas. And how the combination and consolidation of cross-sector synergies will be addressed. One source of inspiration could be our new H2020-funded Copernicus App Lab data access platform.



Thorsten Rudolph  
Managing Director  
AZO Anwendungszentrum GmbH  
Oberpfaffenhofen

The objective here is to merge the scientific EO community and mobile developers' applications. Facilitating access to these kinds of services will take EO to the next level in terms of extended use.

As you can tell: It certainly remains exciting. Stay tuned for the next Copernicus Masters operational phase from April till June 2018.

"The Copernicus Masters is an excellent example for boosting this process in a truly pan European way. Within the last six years, this leading innovation competition for Earth observation applications has been showcasing and promoting the most pioneering solutions with the overall purpose of benefitting Europe's economy and society."



## ESA'S INTRO

Earth observation (EO) full speed ahead. In terms of business, that would be my personal headline for 2018. To be more precise: More opportunities for business and technology development for the EO community, institutions, startups, R&D as well as SMEs.

This year has been of high significance for Copernicus – Europe's space programme for EO. The launch of Sentinel-2B in March completed the second fully operational Copernicus mission. The space craft carries a wide-swath high-resolution multispectral imager for a new perspective of our land and vegetation. And there is more to come: The launch of the first mission dedicated to monitoring our atmosphere, Sentinel-5P, launched on 13 October 2017. It is equipped with state-of-the-art instruments to map a diversity of trace gases, such as nitrogen dioxide, ozone, carbon monoxide. These gases have negative impact on the air we breathe around the globe and our climate. Both Sentinel satellites contribute new valuable data to Europe's EO ecosystem, offering several terabytes to its users on a daily basis. They are not only important assets for fostering the User Uptake and raising awareness for Copernicus and its countless application fields.

They also function as another boost increasing the development of "Space 4.0". Technological breakthroughs and space always influence each other. Therefore, it is essential to refine our space capabilities, the commercialisation of space technologies and support the foundation of space companies, in order to drive the European competitiveness with a concerted effort.

It is for that reason, I like to think of Europe as "United Space in Europe", especially in times where national interests seem to dominate the sense of community. 2017 also represents the next level of growth for the Copernicus Masters – Europe's leading innovation competition for EO applications. Not only has the European Commission (EC) increased its involvement with six additional EC Challenges on top of its Copernicus Accelerator programme. ESA has opened the Copernicus Masters portfolio to upstream services, inviting Copernicus Masters participants to come up with ideas for building a small satellite to be launched at the end of next year, for a budget not exceeding EUR 1 million.

Not surprisingly, this challenge has caused an enormous echo in the space related SME and start-up communities and has boosted the overall prize pool of the innovation competition to more than EUR 1.5 million.



Johann-Dietrich Wörner  
Director General  
European Space Agency (ESA)

I am curious to see what the winner of this ESA challenge will come up with! My respect and congratulations go out to all participants and winners of the Copernicus Masters 2017 edition! And a big thank-you again to the competition organisers at ESA and AZO Anwendungszentrum GmbH Oberpfaffenhofen.

Well done!

"The European Space Agency (ESA) has opened the Copernicus Masters portfolio to upstream services, calling Copernicus Masters participants to build their own small satellite to be launched next year. This boosted the overall prize pool of the innovation competition to more than EUR 1.5 million."



## COPERNICUS ACCELERATOR

"I am pleased to welcome the 50 new participants in the second Copernicus Accelerator Programme by the European Commission. It is very encouraging to see a growing number of participants compared to last year: With more than 200 innovative proposals for the use of EO, and in particular of Copernicus data. The six challenges launched by the European Commission in the area of security, sustainability, B2B, Big Data, government and services prepare the ground for the future of the Copernicus programme, with the goal to improve the monitoring of our environment and security, while fostering growth and jobs in the European economy. This cumulated know-how, expertise and entrepreneurial spirit demonstrate the innovative potential in Europe. With the Accelerator Programme we very much hope that we support the great ideas and the teams behind them in their further development for their own success, and also to the benefit of all. I congratulate all participants in the Copernicus Accelerator 2017 for their outstanding contribution to the Copernicus programme!"



Finalists in the Copernicus Masters are offered with a unique coaching service tailored to their needs and preferences. But that's not all: The mentees of the programme can benefit from a monthly online training programme focusing on business and technical topics, as well as continuous marketing support and promotion that will help them to raise awareness for their company and activities.



In addition to getting access to pioneering ideas and providing a remunerated coaching service to the brilliant minds behind them, mentors will also have the chance to interact with industry stakeholders, renowned institutions and forward-thinking peers. Mentors have been selected from a pool of expert applicants based on their ability to leave their mark and shape the future of space-related innovations.



Philippe Brunet  
Director for Space Policy, Copernicus  
and Defence, DG for Internal Market,  
Industry, Entrepreneurship and SMEs  
European Commission (EC)

### A EUROPEAN COMMISSION INITIATIVE

Established in 2016, the Copernicus Accelerator has enriched the value of the Copernicus Masters competition for its participants. Owned and funded by the European Commission (EC), this unique initiative provides a customised business development scheme for the winners and finalists of each Copernicus Masters Challenge. The aim is to support the best 50 entrants with EU residency to move beyond idea conception into real commercial ventures. Over the course of one year, the Copernicus Accelerator mentees can benefit from individual coaching support worth an additional overall value of EUR 250,000. The Copernicus Accelerator Programme can be considered an ambitious programme not only for the continuous support it provides to participants, but also for the varied training and promotional opportunities it makes available.

Copernicus  
accelerator



a European Commission programme

The Copernicus Accelerator wants to become synonymous with supporting innovative startups all over Europe that contribute to society and business through their ground-breaking solutions.



## ABOUT COPERNICUS

By rising to the global challenges of climate change and responding to the ever-growing and diverse stress factors placed on the environment and civil security, Europe's Copernicus programme is set to take a significant step forward in the way we care for our planet. Copernicus is the most ambitious Earth observation programme to date and is an integral component of Europe's ambitious activities in space. It responds to the needs of its users and ultimately serves European citizens – both directly through its products and applications and indirectly through its social, economic and environmental benefits. The Copernicus programme is under the overall leadership of the European Commission, which acts on behalf of the European Union (EU) and is responsible for the programme's Services Component. The EU's main partner in this endeavour is the European Space Agency (ESA), coordinating the Space Component, which is the heart of Copernicus. In addition, the European Environment Agency (EEA) gathers data from a network of various airborne sensors and ground stations.

Copernicus thus consists of a complex set of systems that collect information from multiple sources, including the aforementioned sensors and Earth observation satellites. The Space Component comprises two types of satellite missions: The dedicated Sentinel missions, which were developed by ESA specifically to meet the Earth observation needs of Copernicus users and the



Sentinel-3, © ESA/ATG medialab

Contributing Missions, which involve a number of existing and planned Earth observation satellites from other space agencies or organisations that also provide data to the programme. The Sentinels, each of which carries state-of-the-art technology, provide a unique set of observations. The data generated is not only open to users worldwide, but also provided free of charge. This enables Copernicus to contribute to the development of a wide variety of innovative applications and services tailored to specific public or commercial needs. As a result, business opportunities are emerging in air-quality forecasting, flood warning systems, early detection of drought and desertification, early severe-weather warnings, oil-spill detection and drift prediction, sea-water quality, crop analysis, forest monitoring, changes in land use, agriculture, food security, and humanitarian aid – to name just a few.

Source: ESA



Sentinel-5P released into orbit. © ESA/ATG medialab



## THE SPACE COMPONENT

The Space Component forms the heart of the Copernicus programme. This element delivers a wealth of data from six families of Sentinel satellites that are being developed by ESA specifically for Copernicus. Data from the Sentinels are then fed into six types of services – Marine, Land, Atmosphere, Emergency, Security and Climate Change – to benefit the environment and the way we live. This data is used in a wide variety of areas, including: Mapping land cover and tracking the way land is being used; improving agricultural practices and forest management; monitoring the oceans for maritime safety and efficiency; and tracking pollution in the air we breathe. The Sentinels also offer key information that supports rapid responses to natural disasters and promotes humanitarian efforts in times of crisis. Once the data is received on the ground, a network of corresponding archiving centres provides systematic data processing. All data products are archived and disseminated to users online. While the ground segment of each Sentinel mission includes specific components, all the related facilities are united to form the Copernicus Space Component Ground Segment. In particular, access to the Copernicus Space Component (CSC) data is coordinated through the CSC Data Access System.



There are currently six Sentinel families carrying a range of technologies that monitor land, ocean and atmosphere. Sentinel-1 is a polar-orbiting, all-weather, day-and-night radar imaging mission for land and ocean services. The first Sentinel-1 satellite, Sentinel-1A, was launched on a Soyuz rocket from Europe's Spaceport in French Guiana on 3 April 2014. Sentinel-1B was launched on 25 April 2016. Sentinel-2 is a polar-orbiting, multispectral high-resolution imaging mission for land monitoring to provide, for example, imagery of vegetation, soil and water cover, inland waterways and coastal areas. Sentinel-2 can also deliver information for emergency services. Sentinel-2A was launched on 23 June 2015 and Sentinel-2B followed on 7 March 2017. Sentinel-3 is a multi-instrument mission to measure sea-surface topography, sea- and land-surface temperature, ocean colour and land colour with high-end accuracy and reliability. The mission will support ocean forecasting systems, as well as environmental and climate monitoring. Sentinel-3A was launched on 16 February 2016. Sentinel-3B is scheduled for launch in 2017. Sentinel-4 is a payload devoted to atmospheric monitoring that will be embarked upon a Meteosat Third Generation-Sounder (MTG-S) satellite in geostationary orbit. Sentinel-5

is a payload that will monitor the atmosphere from polar orbit aboard a MetOp Second Generation satellite. Sentinel-5 Precursor satellite mission is being developed to reduce data gaps between Envisat, in particular the Sciamachy instrument, and the launch of Sentinel-5. This precursor mission is dedicated to atmospheric monitoring and was launched in October. Sentinel-6 carries a radar altimeter to measure global sea-surface height, primarily for operational oceanography and for climate studies. Its launch is planned for the second half of 2020.

Source: ESA





## SUCCESS STORIES FROM PREVIOUS YEAR'S WINNERS

### UrtheCast Corp. – An Earth-Imaging System for Earth Observation

This geospatial and geo-analytics company won the T-Systems Challenge of the Copernicus Masters 2011. Their development of the OptiSAR™ and UrtheDaily™ Earth observation satellite constellations represents the world's first commercial EO constellation with integrated optical and Synthetic Aperture Radar (SAR) sensors worth EUR 168 million. UrtheCast impressively shows how commercial demand for this kind of technology exists and has to be exploited. They provide cloud-based APIs, services, and tools to power applications and derive answers from geospatial data. In doing so, it enables more efficient monitoring of the Earth for its clients. This Candian company has been one of the pioneers in leveraging the commercial synergies between satellite data and the instruments on board the International Space Station (ISS). The company's own ultra-HD cameras have been installed on the ISS, where they are used for monitoring environmental protection efforts, humanitarian aid, social events, agriculture, and many other areas. The resulting high-resolution images and videos are also provided to developers along with analytical tools.

### EnviroSAR© Ltd. – A Targeted Solution for Peat Moorland and Heathland Restoration

As the winner of the 2016 Copernicus Masters Sustainable Living Challenge by the Satellite Applications Catapult, this Earth observation startup focuses on improving the efficiency of managing wildfire disturbance in moorlands and heathlands. EnviroSAR© is unique in that it uses Synthetic Aperture Radar (SAR) to penetrate through clouds in order to provide a more complete picture of the burned areas. This solution is an optimised temporal archive of SAR-derived burned areas and fills in the knowledge gaps that other Earth observation cannot. After securing Sterling Geo as a technical partner in 2016, the team started with the creation of the EnviroSAR© geoportal, which is powered by the established Hexagon Geospatial enterprise technology. This geoportal integrates a range of geospatial datasets that improve stakeholders' understanding of wildfire occurrence, the impact on the environment and on associated businesses. It will improve wildfire regime knowledge, facilitate knowledge exchange, and allow corresponding mapping products to be generated. Ultimately, EnviroSAR© will help mitigate wildfire risks by making land management and reseeded practices more efficient. This will contribute to the existing efforts to prevent peat erosion and therefore reduce water discolouration and the downstream associated costs.

### Sinergise Ltd. – A GIS Company Building Large Turn-key Information Systems

Based in Slovenia, Sinergise Ltd. is a company focusing on advanced applications for GIS editing. Sinergise won the overall prize in the 2016 Copernicus Masters with their product Sentinel Hub – the next generation of satellite imagery services. Sentinel Hub makes it possible to browse, process, and distribute large amounts of data quickly and efficiently – even for non-expert users. Thanks to its ability to integrate into any GIS or web application, this online service is poised to fundamentally affect the daily work routines of developers, scientists, and many other target groups. At the beginning of the year, Sinergise announced that its free satellite imagery visualisation tool called EO Browser is online and ready to use. The browser offers users the possibility to easily search and study vast amounts of archive and fresh satellite imagery residing in the cloud. Sinergise CEO, Grega Milcinski shares his vision for the company "Our vision was to create tools for beginners and experts, which allow users to explore the ground and if desired, to perform advanced analytics on top of it. Applicants can use these tools just for fun or benefit from the data integration in their GIS application within a few seconds".

### SnapPlanet – An App to Create and Share Pictures of Earth from Space

SnapPlanet is the winning startup of the Copernicus Masters ESA App Challenge in 2016 and the Space App Camp 2017 at the Mobile World Congress, Barcelona. Their app "SnapPlanet", enables users to capture beautiful pictures of the Earth while also contributing to the greater mission of raising awareness for our living planet. Founded in the spring of 2016 by Jérôme Gasperi as a spin-off from the French Space Agency (CNES), the aim was to easily capture Earth images from space, then share and discuss what was seen, and to notify users of changes that matter. At its core, SnapPlanet uses Sentinel-2 imagery to provide a "photographic centric" mobile application that creates beautiful images of the Earth from space within seconds. These "snaps" can be annotated, commented and shared, making SnapPlanet a great tool for disseminating data and communicating about current issues such as conflicts and natural disasters or environmental changes. By combining the ever-increasing availability of Earth observation (EO) images with the advantages of a social network for everyone, SnapPlanet drives new uses of EO data to educate and communicate the social, economic and environmental issues that we face today on a global scale.



## University Challenge

### PRIZE

EUR 1,000 cash prize

A consulting package to develop ideas into valid business cases. Additionally, qualifying businesses for one of the 16 ESA BICs (worth up to EUR 50,000).

Substantial satellite data quota worth EUR 5,000 (financial support by EC)

Access to the Copernicus Accelerator Programme (if eligible)

Ticket to the next satellite launch in Kourou

### CHALLENGE

Seeking to bridge the gap from Earth observation research and academia to entrepreneurship, the Copernicus Masters University Challenge was looking for students and research associates to compete for the chance to transform their bright ideas into successful commercial ventures.

This challenge was designed to offer a creative platform for coming up with the most cutting-edge ideas using Earth observation data. Submissions were welcome in any relevant application field, including agriculture management, automotive, emergency management, environmental protection, marine monitoring, mobile applications, renewable energies, and tourism/leisure. In addition to establishing links to the world of business, the University Challenge heightened the exposure and credibility of student-driven innovations at the global level.



Silvia Corti, AZO  
silvia.corti@azo-space.com  
www.space-of-innovation.com

### WINNER

#### Beinn Bike – Smart Mountain Bike Route Planning

Beinn (Scottish word for Mountain) Bike is a revolutionary application offering cyclists a novel way of finding new routes to meet their personal preferences. The idea came about after the Beinn bike team spent a lot of time trawling maps, blogs and websites looking for new epic routes to match their criteria, without knowing the current track conditions and if the route was even suitable for a bike. To solve this, Beinn Bike was developed. It uses rider preferences such as start/end point, distance, difficulty and elevation gain to offer cycle route recommendations matching these demands. The app exploits map, terrain, Earth observation (SAR and optical from Sentinel-1 and -2) and GPS/Galileo data, and uses novel algorithms to identify appropriate routes. The satellite data then provides up-to-date trail conditions. The potential number of users is estimated between 10 – 50 million worldwide.



Dr Steve Owens, Beinn Bike  
info@beinn.bike  
www.beinn.bike



© Beinn Bike

### EXPERTISE

“The jury selected Beinn Bike as the 2017 winner of the university challenge as it represents an ideal combination of high personal engagement, an innovative concept and promising commercial potential.”

Peter Seige, Consultant  
Seige Consulting





## PRIZE

EUR 1 million for design & development of the mission plus launch service free of charge

EUR 10,000 cash prize

Access to the Copernicus Accelerator Programme (if eligible)

Ticket to the next satellite launch in Kourou



ESA Sentinel Small Sat (S<sup>3</sup>) Challenge

## PARTNER

The European Space Agency (ESA) 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. ESA is the overall coordinator of the Copernicus Space Component, safeguarding the uninterrupted delivery of data from the Copernicus Sentinel satellites and from an important number of Copernicus Contributing Missions at national, European and international level.



Dr Thomas Beer, European Space Agency/ESRIN  
thomas.beer@esa.int  
www.esa.int

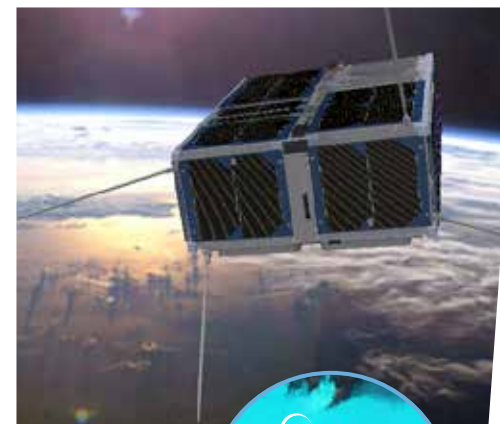
## WINNER

## FSSCat – Towards Federated EO Systems

FSSCat is an innovative mission concept consisting of two federated 6U Cubesats in support of the Copernicus Land and Marine Environment services. They carry a dual microwave payload (a GNSS-Reflectometer and a L-band radiometer with interference detection/mitigation), and a multi-spectral optical payload to measure soil moisture, ice extent, and ice thickness, and to detect melting ponds over ice. It also includes a radio/optical inter-satellite link and an Iridium inter-satellite link to test some of the techniques and technologies for upcoming satellite federations. FSSCat will be the precursor of a constellation of federated small satellites for Earth observation achieving high temporal resolution and moderate spatial resolution in a cost-effective manner.



Adriano Camps, Universitat Politècnica de Catalunya (UPC) & Institut d'Estudis Espacials de Catalunya (IEEC),  
Alessandro Golkar, Visiting Professor of Universitat Politècnica de Catalunya (UPC)  
camps@tsc.upc.edu, alessandro.golkar@ieec.upc.edu  
nanosatlab.upc.edu/en



© UPC

Copernicus  
masters

Overall Winner  
2017



## EXPERTISE

"The Federated Satellite System 6U tandem mission for sea ice and soil moisture monitoring captured the interest of the challenge experts immediately. Not only because the mission concept shows a high degree of well thought through technical novelties, but also because it will provide data that is complementary to the Sentinel fleet. This is especially true for the soil moisture monitoring component, which is not part of the current Sentinel portfolio. The FSSCat mission development is good to go and due to its disruptive approach, we are confident that it will be seen as a breakthrough in procuring future small missions at ESA."

Dr Thomas Beer, Copernicus Policy Coordinator & Giancarlo Filippazzo, Copernicus Programme Coordinator  
European Space Agency (ESA)





## The DLR Environment, Energy and Health Challenge

### PRIZE

EUR 5,000 cash prize

Substantial satellite data quota  
worth EUR 5,000 (financial  
support by EC)

Access to the Copernicus  
Accelerator Programme  
(if eligible)

Ticket to the next satellite  
launch in Kourou

### PARTNER

The Earth Observation Center (EOC) of the German Aerospace Center (DLR) works in all fields related to the development of algorithms and data analysis systems, as well as in the practical implementation of Earth observation applications and services.

As such, the EOC is involved in many aspects of Copernicus' design, implementation, and operations.

DLR also invests in promising technologies and offers its research and development capacities to partners for their own use.



Gunter Schreier, German Aerospace Center (DLR)  
gunter.schreier@dlr.de  
[www.dlr.de/eoc](http://www.dlr.de/eoc)

### WINNER

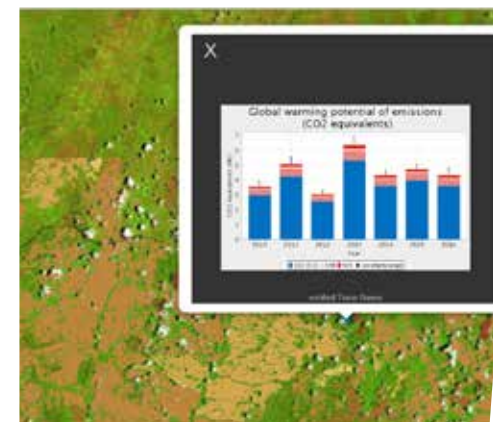
#### firemaps.net – Fire Information from Space

firemaps.net supports fire management through ready-to-use information on fire impact and smoke emissions. Fire is widespread in savanna landscapes in Africa, Australia and South America. Climate change mitigation projects can build conservation financing by reducing greenhouse gas emissions from fires, tapping a market that according to the UN is expected to grow to up to 30 billion USD annually. firemaps.net is where managers and policy makers can get information to develop management strategies and monitor their success. Using Copernicus Sentinel-2 and Sentinel-3 satellites, the solution provides timely fire information for areas of any size up to and including entire countries. Long time-series are derived from historical satellite data to estimate potential reductions of fire emissions. firemaps.net is available as a web application, a geospatial service for use in GIS programs, and as a mobile app.



Gernot Rücker, ZEBRIS GbR  
info@firemaps.net  
[firemaps.net](http://firemaps.net)

**firemaps.net**



© ZEBRIS

### EXPERTISE

“Information about fire is relevant for many aspects – ranging from human security to ecosystem management. firemaps.net shows how remote sensing data can be transformed into fire information. By providing this information in a user friendly way to environmental managers, it enables them to make informed decisions and to reduce negative impacts from bush and savanna fires, such as greenhouse gas emissions or damages to trees.”

Dr Doris Klein, Scientific Coordinator FireBIRD  
German Aerospace Center (DLR)



**T-Systems**

T-Systems Open  
Telekom Cloud  
Challenge

## PRIZE

Support from T-System in the  
realisation of the project and  
potential long-term relationship

Substantial satellite data quota  
worth EUR 5,000

Access to the Copernicus  
Accelerator Programme  
(if eligible)

Ticket to the next satellite  
launch in Kourou

## PARTNER

T-Systems is the corporate customers unit of  
Deutsche Telekom.

Building on a global infrastructure of data  
centres and networks, it operates information  
and communication technology (ICT) systems  
for multinational corporations and public sector  
institutions.

T-Systems is pursuing its mission to shape the  
future of the connected business world and  
society by creating added value for customers,  
employees, and investors through innovative ICT  
solutions.



Dr Jury de la Mar, T-Systems International GmbH  
jury.de.lamar@t-systems.com  
www.t-systems.com

## WINNER

### OpenMapTiles – World Maps on Your Infrastructure

Hundreds of thousands of companies worldwide  
struggle with the limits of the maps available  
only as a hosted service. Now they can install  
a world map on their own server or cloud  
and integrate it into their products, websites  
and mobile apps. OpenMapTiles provides a  
customisable alternative to traditional map  
services, such as Google Maps, with more  
affordable price and completely unlimited  
usage. The maps are built on OpenStreetMap  
and customer specific geographic datasets.  
The aim is to add remote sensing data to the  
maps. Therefore, the solution combines imagery  
from Sentinel-2 satellites and opens aerial  
photographs to create a seamless satellite map  
of the whole world. It automatically adjusts to  
language, context and time of day and can be  
customised for corporate use. OpenMapTiles has  
been already adopted by Siemens, IBM, Bosch,  
Amazon, Swiss Federal Railways, and others.



Petr Pridal, Klokkan Technologies GmbH  
info@openmaptiles.com  
www.openmaptiles.org



© OpenMapTiles

## EXPERTISE

“OpenMapTiles will change the  
way maps and geoinformation  
is being used in industry. Its  
unique values include the  
open source software, the  
strong user customisation, the  
flexibility of implementation  
from local to public cloud, and  
the performance based on its  
state-of-the-art use of container  
architecture. T-Systems now has  
the direct opportunity to work  
with OpenMapTiles and develop  
new applications.”

Dr Jury de la Mar, Account Director Global  
Accounts & International Business  
T-Systems International GmbH




**ASTROSAT**

Disaster Management  
Challenge by Astrosat

## PRIZE

Support package prize (worth EUR 8,000) including business & technical assistance to help bringing products closer to market.

Integration of the application into the Astrosat's RAPID demonstrator. Showcase it to existing and potential new, RAPID customers (part of the RAPID-in-a-Box booth at worldwide exhibitions).

Substantial satellite data quota worth EUR 5,000 (financial support by EC).

Access to the Copernicus Accelerator Programme (if eligible)

Ticket to the next satellite launch in Kourou

## PARTNER

Astrosat is a private sector, commercial, satellite applications company based in Edinburgh, Scotland.

Astrosat's clients are spread internationally from South East Asia to Central America and consume products as diverse as deforestation monitoring to energy efficiency in the urban environment as well as disaster response management.



Dan Ghoray, Astrosat  
dan.ghoray@astrosat.space  
www.astrosat.space

## WINNER

### DANTE – Real-time Wildfire Alarms

Wildfires are a global phenomenon that can have a devastating impact on a country's population and environment and represents a EUR 52 billion market affecting 5.8 million people worldwide. DANTE is an integrated low-cost solution for the early detection of forest fires featuring advanced methods to report and manage a fire within seconds of it starting. Its high performing image processor is embedded within a low-cost hardware platform and integrated into a smart connectivity network. It provides a prompt alarm system which evaluates the danger of a fire, maps burnt areas and guides firefighting operations as a real-time navigator. The system can be integrated and managed remotely from existing emergency control rooms. It provides high spatial and temporal resolution maps of the active fire, as an in-situ real-time dataset complementary to Sentinel.



Luis Crespo, AD TELECOM, S.L.  
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www.adtelecom.es



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## EXPERTISE

"Already equipped with significant endorsement from end users, DANTE combines ruggedised in-situ measurements with rapid geo-mapping capabilities to revolutionise the fight against wildfires. This is an exciting opportunity to combine DANTE with the cutting-edge satellite and space technology expertise of Astrosat to combat the devastating effects of wildfire."

Dan Ghoray, Business & Innovation Analyst  
Astrosat





Big Data Big Business  
Challenge by CGI

## PRIZE

Showcasing the application to the CGI industry teams and relevant customers in appropriate target markets.

CGI support to integrate the prototype onto their exploitation platform. Additional support on industrialising the architecture (for such as scalability, reliability, revenue collection, security) qualifying for pre-operation with industry customers.

Substantial satellite data quota worth EUR 5,000 (financial support by EC)

Access to the Copernicus Accelerator Programme (if eligible)

Ticket to the next satellite launch in Kourou

## PARTNER

CGI is a global end-to-end IT and business process services leader, with over 40 years' experience of delivering complex, secure, mission-critical space systems.

CGI is focused on applying satellite Earth observations to help organisations meet their business challenges, by developing operational, sustainable space-enabled services.

The company's global footprint, access to markets, strong IT and space skills, make a powerful combination for building valuable business partnerships.



Andy Thompson, CGI  
andy.thompson@cgi.com  
[www.cgi-group.co.uk/space/earth-observation](http://www.cgi-group.co.uk/space/earth-observation)

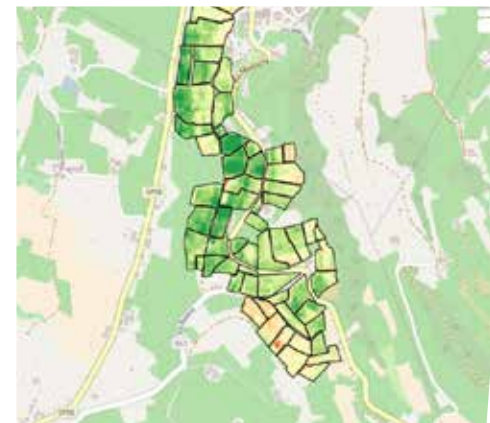
## WINNER

### Saturnalia – How Good is Your Wine?

Fine wine is recognised as an alternative asset class, whose value is strictly related to its quality. Wine investors and distributors want early information on wine quality to make earlier and better investment decisions than their competitors. The total wine market value in 2015 reached EUR 28.3 billion.

The Saturnalia service collects, aggregates, and analyses data related to vine growth. It then uses this data to forecast wine quality and can do so for any region around the globe. At its core lies a system for automated retrieval and analysis of Sentinel-1 and -2 and environmental data over the areas of interest.

The service will let investors and distributors access insights on wine quality indicators and their trends, as well as help vine growers to manage and care for their crops. The proposed solution is an advanced, smart combination of Earth observation and environmental data.



© Ticinum Aerospace



Daniele De Vecchi, Ticinum Aerospace  
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[www.saturnalia.tech](http://www.saturnalia.tech)



## EXPERTISE

"We were delighted that Saturnalia identified a new and innovative application of Sentinel Earth observation data to forecast wine quality. This could create a new market with the potential for global growth. The energy and creativity of the team shone through, impressing the judges and we are excited to support them on their journey."

Cock Overbeek, Vice President Space  
CGI



Federal Ministry  
of Transport and  
Digital Infrastructure

## The BMVI Earth Observation Challenge for Digital Transport Applications

### PRIZE

EUR 5,000 cash prize

Tailored support package including access to the expertise of Copernicus-related agencies, cloud computing facility and Copernicus data archive CODE-DE (Copernicus Data and Exploitation Platform – Deutschland).

Substantial satellite data quota worth EUR 5,000 (financial support by EC)

Access to the Copernicus Accelerator Programme (if eligible)

Ticket to the next satellite launch in Kourou

### PARTNER

This challenge has been issued by the German Federal Ministry of Transport and Digital Infrastructure (BMVI) with support from the DLR Space Administration.

The BMVI is the German Ministry in charge of transport, mobility and digital matters, as well as the digital infrastructure, intelligent transport systems in the field of road transport and Earth observation, including Copernicus.



Christiane Hohmeister, Federal Ministry of Transport and Digital Infrastructure  
christiane.hohmeister@bmvi.bund.de  
[www.bmvi.de/EN](http://www.bmvi.de/EN)

### WINNER

#### LiveEO – UAV Integration into Satellite-EO

LiveEO will improve Earth observation applications by closing the gap between observation time, resolution and coverage area. LiveEO is the first private real-time Earth observation application making use of the synergies of Sentinel-2 data and geolocation services. A perfect example for the use of LiveEO is the monitoring of critical infrastructure like railroads and power grids. Its change detection algorithms based on Copernicus data detect critical changes in an area that needs further investigation. LiveEO then determines efficient mission profiles, adds commercial data on demand and can launch connected UAVs. In-situ data (e.g. LIDAR, gas composition and temperature) gained through UAVs like h-aero will be available immediately through an internet connection from UAVs to LiveEO. LiveEO benefits from the Berlin based space startup network [www.newspace.vision](http://www.newspace.vision).



Daniel Seidel, Sven Przywarra, White Sands Earth Observation, LiveEO  
Dr Singer, Christian Schultze, Hybrid Airplane Technologies, h-aerom  
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[www.live-eo.com](http://www.live-eo.com)



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### EXPERTISE

“The solution was especially convincing due to the innovative combination of Earth observation, GNSS and UAV. The significantly longer flight time capabilities of the UAV unlocks new potential and efficiency when it comes to screening of infrastructure networks or entering areas of disrupted infrastructure.”

Christina Prien, Head of Global LLP Services and Solutions at DHL Global Forwarding  
DHL





**CATAPULT**  
Satellite Applications

Sustainable Living  
Challenge by the  
Satellite Applications  
Catapult

## PRIZE

Business support package worth  
> EUR 5,500

Substantial satellite data quota  
worth EUR 5,000  
(financial support by EC)

Access to the Copernicus  
Accelerator Programme  
(if eligible)

Ticket to the next satellite  
launch in Kourou

## PARTNER

This challenge has been set by the Satellite Applications Catapult in partnership with Innovate UK, the UK Space Agency and the Science and Technology Facilities Council.

The Catapult is an independent innovation and technology company, created to help organisations make use of and benefit from satellite technologies.

A not-for-profit company, the Catapult provides facilities, platforms and expert knowledge to enable the translation of ideas from concept to market.

in partnership with

Innovate UK



Kirsten Robinson, Satellite Applications Catapult  
kirsten.robinson@sa.catapult.org.uk  
www.sa.catapult.org.uk

## WINNER

### Forest Sentinel – App-based Deforestation Alerts

Deforestation is a threat to the world's forests. Every minute, 48 football fields of forest are lost globally and the REDD+ initiative aims to reduce this deforestation. In order to enable timely interventions of illegal logging, rapid access to deforestation alerts is required.

Forest Sentinel delivers alerts to the user's mobile phone within 24 hours of Sentinel-2 image acquisition. Alerts are sent every five days and are pushed to a big data analytics engine where they can be accessed via a user-friendly dashboard. App users who receive the alert can upload photos, voice and text messages and a questionnaire. The head office can see them on the dashboard and trigger appropriate responses to protect the forest. 360° communication via the dashboard and app allows effective liaison with field staff, aided by satellite data.



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Prof Heiko Balzter, University of Leicester & National Centre for Earth Observation, UK  
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www.le.ac.uk/clcr



## EXPERTISE

"We are excited to be announcing Forest Sentinel as the winner of the Sustainable Living Challenge. Forests are one of our critical resources as we look to sustainably manage the planet and reduce climate change. Deforestation is a major issue and Forest Sentinel will be the first operational service that will deliver near-real-time deforestation alerts to registered users such as forest managers. This will allow appropriate action to be taken and the incentives for logging illegally to be reduced, seeing Sentinel data protecting our forests and our future. The Catapult and our Challenge partners are looking forward to working with and supporting Forest Sentinel."

Sam Adlen, Head of Business Innovation  
Satellite Applications Catapult





European Commission (EC)

[www.copernicus.eu](http://www.copernicus.eu)

## The Partner

The European Commission is responsible for managing and implementing several Space Programmes, including Galileo (the European GPS) and Copernicus, which provides free Earth observation data and services for environment and security. Copernicus products are used to help save lives at sea, improve our response to natural disasters, and allow farmers to better manage their crops.

## The Prizes

- › EUR 5,000 cash prize
- › Substantial satellite data quota worth EUR 5,000
- › Access to the Copernicus Accelerator Programme by the EC
- › Ticket to the next satellite launch in Kourou

## The European Commission Challenges

The European Commission was looking for innovative ideas based on Copernicus data and/or Copernicus services, that can deliver concrete value for users. Through its different Challenges, the EC aims at fostering the development of a competitive European space industry, while maximising opportunities for European enterprises to develop and provide innovative Earth observation services.



### **Copernicus Sustainable Development Challenge**

Participants were asked to deliver new and cost-effective environmental and societal services.



### **Copernicus Government Challenge**

Participants should provide new and cost-effective services for public authorities at the European, national, and local level.



### **Copernicus Big Data Challenge**

Applicants were asked to improve the access to Copernicus data and services, as well as their processing, visualisation, and combination with other sources of data (EO and non-EO).



### **Copernicus B2B Challenge**

Participants should show Copernicus's significant commercial potential in several business sectors.



### **Copernicus Services Challenge**

Applicants should demonstrate how Copernicus provides added value in different thematic areas (Marine, Land, Atmosphere, Emergency, Security and Climate Change).



### **Copernicus Security Challenge**

Participants were asked to validate how Copernicus helps improving citizens' security and safety.



## Copernicus Sustainable Development Challenge

### CHALLENGE

With this Challenge, the European Commission wanted to demonstrate that Copernicus is a revolutionary tool for sustainable development, as it enables the delivery of new and cost-effective environmental and societal services. Participants in this Challenge should thus have proposed applications that use Copernicus and support sustainable development, in particular with regard to:

- › The achievement of the UN's sustainable development goals (no poverty, zero hunger, good health, clean water...)
- › The sustainable use of natural resources (agriculture, forestry, raw materials, fisheries...)
- › Climate change actions (renewable energy production, monitoring of greenhouse gas emissions...)



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### WINNER

#### BeeNebulaApp™ – Precise Monitoring of Bee Activity

The BeeNebulaApp™ application, a part of the NebulaSystem™, is designed to enhance the knowledge of bee-keeping and apiculture. It uses satellite meteorological data, supplemented by Sentinel series and the data from terrestrial and aerial sensors, to determine the moment and location of bee foraging. Automatic generated reports will be delivered to users through the dedicated mobile application. Approx. 11 million agricultural holdings in EU can benefit from BeeNebulaApp™ as law regulations prohibit spraying during bee activity. Thanks to the app, pesticides will be used more precisely to increase honey production, yield and quality of environment. BeeNebulaApp™ processes global data in a simple and accessible format for everyone to use. It will build a network of interactions between beekeepers, farmers and politicians to reduce the negative impact of agricultural activities, while respecting the needs of farmers.



Sylvia Nasilowska, Institute of Aviation  
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### EXPERTISE

"The jury nominated the project BeeNebula as the winner of this challenge because it proposes an innovative application addressing societal needs in the context of the overall Sustainable Development Goals – in particular, it focused on a very specific area: The sustainable protection of bees."

Christoph Roeland, Policy Officer  
 European Commission (EC)





## Copernicus Government Challenge

### CHALLENGE

With this Challenge, the European Commission wanted to demonstrate that Copernicus is a powerful tool for the public sector, as it enables the delivery of new and cost-effective services for public authorities at the European, national, and local level.

Participants in this Challenge should thus have proposed applications that use Copernicus and support public authorities. Possible examples include:

- › Applications to monitor the implementation of regulatory obligations (e.g. monitoring of air pollution, water quality, or agriculture subsidies)
- › Applications to support public authorities in providing public services (urban planning, infrastructure management, public transportation, smart cities...)



Martina Sindelar, European Commission (EC)  
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### WINNER

#### SOUL – Sensor Observation of Urban Life

European citizens living in urban areas often breathe air that does not meet standards and respiratory diseases are becoming more the rule than the exception worldwide, with more than 600 million people affected. The impact of air pollution on the economy is tremendous, EUR 200 billion per year, with both direct impacts like hospitalisation, and indirect such as absenteeism and ultimate death. SOUL is an environmental platform that aggregates air quality data, creating risk analysis and analytics to be used by the government, insurance companies, organisations and end-users. It provides street level spatial resolution and time forecast based on Copernicus services, satellite imagery, like the recently launched Sentinel-5P, and sensors that, combined with machine learning and downscaling algorithms, helps people to avoid environmental health threats in cities.



Pedro Jorge Caridade, SpaceLayer Technologies  
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**space**layer  
technologies



© SpaceLayer Technologies

### EXPERTISE

"The jury recognises the contribution that the solution SOUL could make by offering a smartphone app through which citizens can download and monitor the pollution in their city. Thus, the project combines governmental tasks with a very user-friendly application. We congratulate the team of SpaceLayer Technologies from Portugal."

Julien Turpin, Policy Officer  
European Commission



## Copernicus Big Data Challenge

### CHALLENGE

With this Challenge, the European Commission wanted to support applications that facilitate the use of Copernicus data and services and/or make it available to non-experts. Participants in this Challenge should have proposed applications designed to improve access to Copernicus data and services, as well as their processing, visualisation, and combination with other sources of data (EO and non-EO). Possible examples include:

- › Software to facilitate the integration of Copernicus-based maps into other applications
- › A mobile app that allows simple visualisation of Copernicus data and services
- › Software to facilitate the combination of Copernicus data with other sources of data
- › Protocols to ease the use and processing of Copernicus data and services
- › Software to enable analytics for Copernicus data and services



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### WINNER

#### SandMap – An Interactive, Real-time, Tangible 3D GIS

SandMap visualises Earth observation and geospatial information onto 3D sand formations that respond to shape changes imposed by users in real-time. The main functions of SandMap include real-time adaptive visualisation of any 3D information (contours, inclination, visibility), as well as interactive similarity exercises to familiarise students with geography. It also offers adaptive scenario modelling by placing miniature coded objects on the sand (representing people, vehicles, etc), and a VR headset connection in order to virtually experience any area, its morphologic changes (e.g. landslides) and all Sentinel multi-spectral data in first person views. SandMap capital introduces a whole new scale of interactive education and adaptive modelling for decision makers, transforming Big spatial Data to Smart Data. It promotes geographic awareness as a novel interactive education tool.

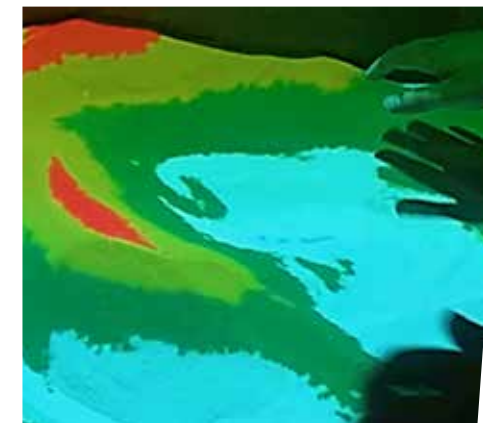


Panagiotis Partsinevelos, SenseLAB Research,  
Technical University of Crete  
pparts@gmail.com  
[www.senselab.tuc.gr](http://www.senselab.tuc.gr)



### EXPERTISE

It also advances a wide range of modelling applications: Natural disasters, emergency management, security, agriculture, healthcare, e-Government and more. It is a must-have for every school and command centre.



© SenseLAB

“The jury selected the project SandMap because it successfully addresses the requirements and objectives of this challenge: It will make Sentinel data easier to use, it will bring the data very close to pupils and students, and it uses the new cloud-based e-infrastructure called DIAS. We congratulate the team of the Technical University of Crete on this promising project.”

Martina Sindelar, Policy Officer  
European Commission





## Copernicus B2B Challenge

### CHALLENGE

While the Copernicus programme was primarily designed to address societal challenges (climate change, urban development...), it can also support many different business sectors, such as insurance, construction, transportation, and agriculture. With this challenge, the Commission wanted to demonstrate that Copernicus presents significant commercial potential. Participants were asked to submit applications that use Copernicus and provide a service to businesses in commercial sectors. Possible examples include:

- › An application to help insurance and reinsurance companies predict or evaluate losses
- › A service to improve extraction of raw materials (mining, oil and gas...)
- › Applications for farmers, forest-owners, and fishermen
- › Applications to improve the production of renewable energies (solar, biomass...)
- › Services to help construction companies monitor infrastructure
- › Transportation services



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### WINNER

#### farmAR – farmAR Makes the Invisible Visible

Farmers want to spend time in the field, not in their office looking at 2D maps that do not provide useful information about their crops. The farmAR app adds an extra layer of 3D information to a mobile phone's camera display. This layer depicts geoTags that contain important information and location. Upon the farmer's request, the geoTags are automatically generated using primarily Sentinel-2 data. This allows farmers to act quickly and more precisely, making adjustments only where and when needed. As a result, the farmer is able to increase crop yield, optimise inputs and improve profitability – all while contributing to a more sustainable agriculture. farmAR sits within the global geographic information system (GIS) market that is expected to grow to USD 14.6 billion by 2020 with the market share for agriculture at 5% and growing.



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beril@farm-ar.com  
[www.farm-ar.com](http://www.farm-ar.com)



© farmAR

### EXPERTISE

"The jury awarded the prize to the most disruptive project: farmAR. This startup is using Augmented Reality to display information for farmers, based on Copernicus data. Augmented Reality makes Earth observation data much easier to use and understand in not only an agricultural context but also potentially in other domains (energy, infrastructure monitoring...). The farmAR team consists of two extremely competent and complementary women entrepreneurs."

Thibaud Delourme, Team Leader  
European Commission



## Copernicus Services Challenge

### CHALLENGE

In addition to the Sentinel satellites, the Copernicus programme offers access to a set of services that provide free products in six thematic areas (Marine, Land, Atmosphere, Emergency, Security and Climate Change; see [copernicus.eu/main/services](https://copernicus.eu/main/services)). With this Challenge, the EC wanted to demonstrate that the Copernicus services provide added value in many different applications areas. Possible examples include:

- › An application to use products from the Copernicus Atmosphere Monitoring Service to improve predictions on solar panel energy production
- › A service that uses products from the Copernicus Marine Environment Monitoring Service to improve erosion monitoring in coastal areas
- › An application that uses products from the Copernicus Land Monitoring Service to improve forest monitoring and biomass production
- › An application that augments the resolution of products from the Copernicus Climate Change Service to improve adaptation to climate change at the local level



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[www.copernicus.eu](https://www.copernicus.eu)

### WINNER

#### DroneSAR – Transforming Drones for Search & Rescue

DroneSAR enables the use of affordable drone technology to expedite search and rescue (SAR) missions when teams are faced with risk, time and resource constraints. It allows the drone operator to plan, execute and perform search mission's based on variables including altitude, field-of-view, battery life and probability of detection. DroneSAR enhances situation awareness and first-person-view (FPV) through its live low latency video streaming. The tracking of multiple drone activities, coordinates, flight status and mission progress can be relayed to team members and (SAR) coordination centres for immediate operational observation and analysis. When used for post disaster emergency response together with Sentinel-1 and -2 mapping data, DroneSAR ensures a coordinated delivery of the right information to the right people at the right time so lives can be saved.



Leo Murray, DroneSAR  
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[dronesarpilot.com](https://dronesarpilot.com)



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### EXPERTISE

"The jury nominated the DroneSAR UAV search and rescue platform as the winner because it is very relevant to emergency management. The added value for the users is very high as the services provided by the project are complementary to the Copernicus Emergency Management Service in real-time and at a very local scale. Furthermore, the company has already established a partnership with a leading drone manufacturer. We wish the company quick market success and congratulate them for their work."

Hugo Zunker, Policy Officer  
 European Commission





## Copernicus Security Challenge

### CHALLENGE

With this Challenge, the European Commission wanted to demonstrate that Copernicus offers significant potential to improve citizen security and safety. Participants were asked to submit applications that use Copernicus data and improve the security, safety, and defence of people. Possible examples include:

- › Civil security applications to improve the prediction, monitoring, and management of natural disasters (floods, avalanches, forest fires, earthquakes...), for public emergency services or insurance companies
- › Applications to support defence objectives and military operations
- › Services to improve the design, monitoring, and management of humanitarian operations



Martina Sindelar, European Commission (EC)  
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### WINNER

#### OPTOSS AI – Incident & Security Alarm Platform

Extreme weather forecasts currently notify people living in regional environments but are only partially effective. 2-3 times a year, large areas of the Netherlands are hit by storms with wind speeds that significantly exceed safe levels. One such storm this year caused over 10 million Euro in property damages, including a fatality and millions of lost man-hours. To combat these unnecessary losses, OPTOSS will pinpoint affected areas then notify emergency services and the local inhabitants of the impending danger. OPTOSS will ensure the flawless function of emergency notification systems and provide detection of critical situations on a countrywide scale. Incidents are prevented through early notification and corrective action. Patterns are recognised autonomously, reducing operator workload while increasing effectiveness. OPTOSS will combine in-situ sensor data with topographical



Taras Matselyukh and Team, OPT/NET BV  
[hello@optoss.nl](mailto:hello@optoss.nl)  
[optoss.nl](http://optoss.nl)



and temperature maps from Sentinel-1 and Sentinel-3 satellites, weather and environmental data to produce a real-time picture of expected and actual damages.



© OPT/NET BV

### EXPERTISE

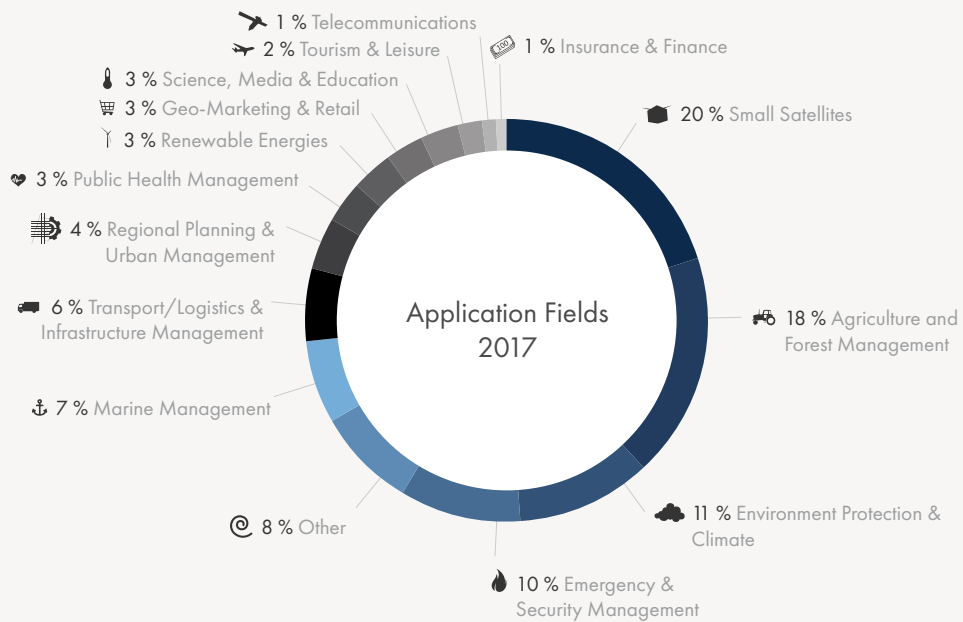
"The jury selected OPTOSS as the winner of this challenge because it deals with large amounts of observational data under stressful conditions. These conditions increase the risk of failing to detect a threat. In this context OPTOSS may close the current gap that exists for the Copernicus Emergency and Security Services with regard to situational awareness and intelligence in critical situations. We congratulate the winner and wish the project a quick Uptake."

Ivan Konaktchiev, Policy Officer  
European Commission



## APPLICATION FIELDS

Earth observation offers tremendous opportunities for creating pioneering applications and solutions. Enabled by the Copernicus programme, a wide variety of industries and fields of major European public interest can benefit from these innovations.



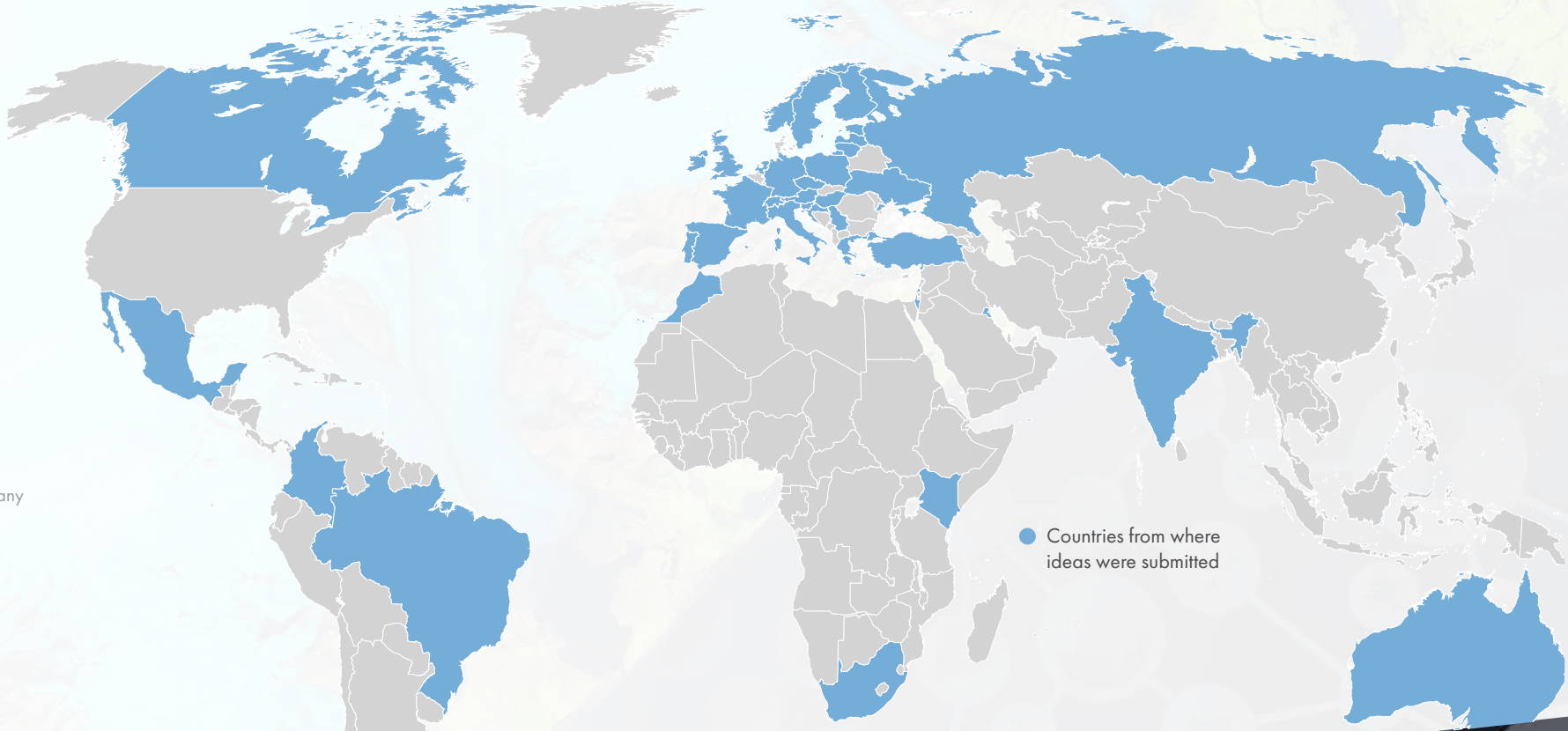
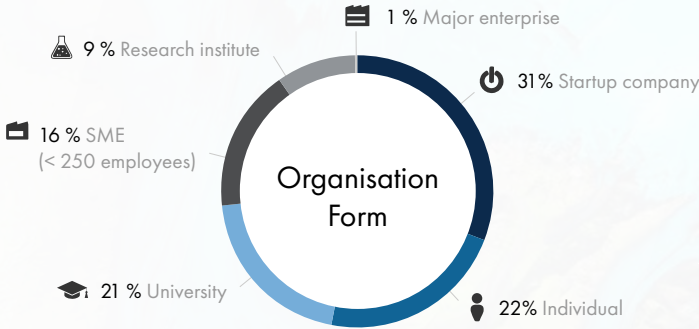
The data generated are not only open to users worldwide, but also provided free of charge. This enables Copernicus to contribute to the development of a wide variety of innovative applications and services tailored to specific public or commercial needs.





# STATISTICS

The Copernicus Masters emphasises the huge potential for Earth observation in all areas and aspects of life. More than 1,100 completed ideas from over 70 countries all around the world have been showcasing the exciting future of EO solutions and applications. Have a look where the 2017 edition's winners are from and how their organisations are formed.





## THE EXPERTS

### University Challenge

**Dr Thomas Beer**

European Space Agency (ESA), Copernicus Policy Coordinator, ESRIN

**Hinnerk Gildhoff**

SAP, Development Manager

**Barnaby Osborne**

International Space University, Associate Professor

**Thorsten Rudolph**

AZO, Chief Executive Officer

**Dr Sven Schade**

European Commission, Joint Research Center, Scientific Project Officer

**Peter Seige**

Seige Consult, Consultant

### ESA Sentinel Small Sat (S<sup>3</sup>) Challenge

**Dr Thomas Beer**

European Space Agency (ESA), Copernicus Policy Coordinator, ESRIN

**Fabio Caramelli**

European Space Agency (ESA), Project Manager VEGA SSMS, ESRIN

**Bernardo Carnicero Dominguez**

European Space Agency (ESA), Earth Observation System Engineer, ESTEC

**David Evans**

European Space Agency (ESA), Mission Operations Concept Engineer, ESOC

**Giancarlo Filippazzo**

European Space Agency (ESA), Copernicus Programme Coordinator, ESRIN

**Piero Galeone**

European Space Agency (ESA), Head, Tertiary Education Unit. ESA Education Office, ESTEC

**Patrick Grimont**

European Space Agency (ESA), EO Applicat. Engineer, ESRIN

**Dr Pierre Philippe Mathieu**

European Space Agency (ESA), EO Data Scientist, ESRIN

**Andrea Simonini**

European Space Agency (ESA), Quality Assurance Manager. Business Unit Controlling Office, ESTEC

**Hendrik Stark**

European Space Agency (ESA), Head of the Copernicus Space Segment Office, ESTEC

**Roger Walker**

European Space Agency (ESA), Systems Engineer, ESTEC

### The DLR Environment, Energy and Health Challenge

**Elisabeth Becker**

BayWa AG, Project Manager Smart Farming

**Martin Ditter**

European Commission DG GROW, Policy Officer

**Dr Rolf-Dieter Fischer**

German Aerospace Center (DLR), Head of Technology Marketing

**Dr Jutta Graf**

German Aerospace Center (DLR), Head Scientific Information

**Dr Susann Groß**

German Aerospace Center (DLR), DLR Program Directorate Space (PD-W)

**Dr Stephan Illerhaus**

Stadtwerke München (swm), Director, Portfolio Management and Energy Trading

**Robert Klarner**

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### T-Systems Open Telekom Cloud Challenge

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**Michael Neuß**

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**Gert Ohme**

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**Dr Michael Pauly**

T-Systems International GmbH, Marketing Public Sector & Healthcare

**Natascha Zierow**

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### Disaster Management Challenge by Astrosat

**Dan Ghoraray**

Astrosat, Business and Innovation Analyst

**Steve Lee**

Astrosat, CEO

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## THE EXPERTS

### Big Data Big Business Challenge by CGI

**Jon Earl**

CGI, Solution Architect

**Andrew Groom**

CGI, Director Earth Observation Exploitation

**Cock Overbeek**

CGI, Vice President Space

**Victor Rijkaart**

CGI, Director Earth Observation Applications

**Andy Thompson**

CGI, Vice President Earth Observation

**Peter Wright**

CGI, Small Medium Enterprises (SME) Accelerate Programme Lead

### The BMVI Earth Observation Challenge for Digital Transport Applications

**Alexandra Förster**

DLR, Scientific Staff

**Christiane Hohmeister**

BMVI, Policy Officer

**Vanessa Keuck**

DLR, Scientific Staff

**Christina Prien**

DHL, Head of Global LLP Services and Solutions at DHL Global Forwarding

**Iris Wiebrock**

DB Netz AG, Expert for geoinformation management

### Sustainable Living Challenge by the Satellite Applications Catapult

**Sam Adlen**

Satellite Applications Catapult, Head of Business Innovation

**Craig Brown**

Innovate UK, Lead Space Technologist

**Matthew Edwards**

Science and Technologies Facilities Council, Relationship Manager, Space Business Incubation

**Emily Gravestock**

UK Space Agency, Head of Application Strategy

**Stephen Spittle**

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### EC Challenges

#### Copernicus Sustainable Development Challenge

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**Christophe Roeland**

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**John Smedegaard**

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#### Copernicus Government Challenge

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CloudEO, CEO

**Grega Milcinski**

Sinergise, CEO

**Julien Turpin**

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#### Copernicus Big Data Challenge

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**Uli Fricke**

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**Lara König**  
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