THE WINNERS 2015
RESULTS

copernicus masters

The Earth Monitoring Competition is awarding prizes to innovative solutions for business and society based on Earth observation data.

www.copernicus-masters.com

UPON THE INITIATIVE OF

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PARTNERS

CATAPULT Satellite Applications | National Cadastre & Mapping Agency S.A. | CLOUDEO | European Space Imaging | GEO

ORGANISED BY

Anwendungszentrum Oberpfaffenhofen

INTRO

2015 is again an important year for Copernicus: the second Copernicus satellite, Sentinel 2-A, was successfully launched on 23 June and is already delivering excellent imagery. The launch of Sentinel-3A is about to follow.

The European flagship programme Copernicus will help shape the future of our planet to the benefit of us all. With engineers, scientists and other space enthusiasts from a multitude of backgrounds and home countries working together, this programme will also serve to take us one step closer to our next overall goal: a “United Space in Europe”. The wealth of data produced by Copernicus and its Sentinel satellites can be used for manifold applications along the entire value chain – from monitoring agriculture and rates of deforestation to providing measurements of water quality and real-time imagery for disaster relief.

It was exactly for this reason that the Copernicus Masters competition was initiated five years ago and is now inviting submissions on a world-wide scale: to foster the development of marketoriented applications based on Earth observation data.

I followed the Copernicus Masters already during my previous work at DLR and, today, I am delighted to see that earlier winners are now successfully working on transforming their applications into operational services. In addition to demonstrating that the Copernicus Masters has developed into a driving force behind the innovative use of Earth observation data, this reflects the enormous potential Earth observation has in creating innovative, added-value products and stimulating economic growth in both Europe and the rest of the world. The great success of the Copernicus Masters 2015 has once again served as convincing proof that its organisers had their fingers on the pulse when launching the competition in 2011.

I wish to express my sincere congratulations to all the winners of this year’s Copernicus Masters, as well as to the team of competition organisers at ESA and Anwendungszentrum GmbH Oberpfaffenhofen, who have once again surpassed the successes achieved in previous years.

Prof. Dr.-Ing. Johann-Dietrich Wörner
Director General
European Space Agency (ESA)

Sentinel-2A being encapsulated within the half-shells of the Vega rocket fairing, on 6 June 2015 at Europe’s Spaceport in Kourou, French Guiana.
© ESA–M. Pedoussaut, 2015

Copernicus is the most ambitious Earth observation programme to date. It will provide accurate, timely and easily accessible information to improve the management of the environment, understand and mitigate the effects of climate change and ensure civil security.

ORGANISER'S INTRO

Together with our world-class partners, we launched the Copernicus Masters in 2011 as part of our mission to foster user uptake of Copernicus services. In 2015, the competition has once again demonstrated the huge potential Earth observation holds for the creation of innovative products and services. This year's 208 submitted entries, which represent a 22% increase over the previous year, offer an exciting glimpse into the future of Copernicus services along the entire value chain. Over the past decade, Anwendungszentrum GmbH Oberpfaffenhofen (AZO) has established itself as a driving force behind the European flagship programmes Copernicus and Galileo. We have worked with our partners to act as a catalyst for economic activities that lead to new companies, new jobs, and new application fields – particularly those that are set to benefit from the expansion of digital infrastructures.

Through the Copernicus Masters competition, we aid visionary entrepreneurs in bringing their innovations to market. As part of the ESA Business Incubation programme (ESA BIC Bavaria), we also offer space for innovation in areas that are already shaping the future – the Internet of Things, Industry 4.0, smart cities, and renewable energy, for example. Both in the competition and at the ESA BIC facilities, we have seen interest grow in the commercialisation of Copernicus services over the past years and are confident that this success story will continue following the imminent launch of further Sentinel satellites.

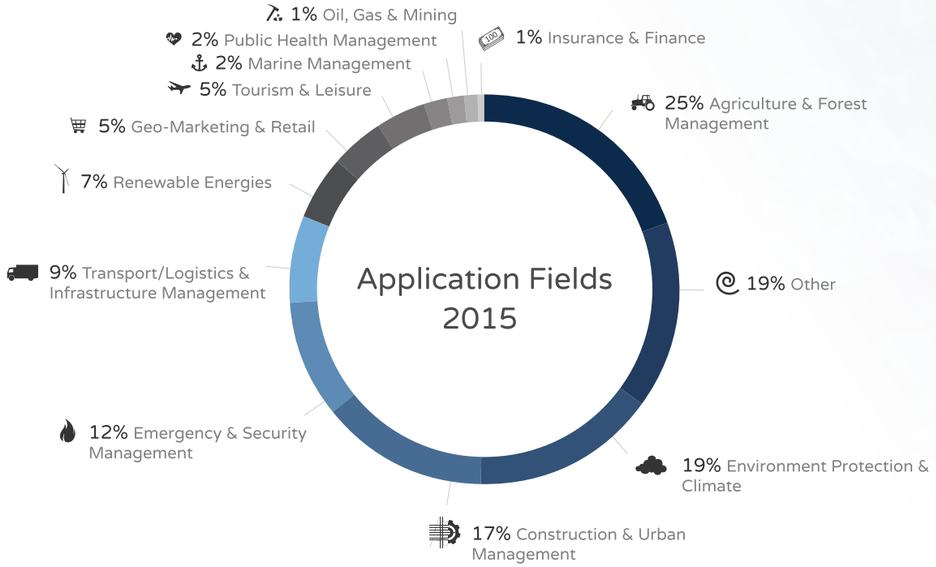
Special thanks are due to our partners, which include: the European Space Agency (ESA), the German Aerospace Center (DLR), T-Systems International GmbH, Satellite Applications Catapult Ltd., Greece's National Cadastre and Mapping Agency (NCMA), CloudEO AG, and European Space Imaging GmbH. As part of the 2015 Copernicus Masters competition, GEO magazine again invited interested participants to apply graphical and artistic techniques to satellite imagery and illustrate them in vivid, artistic ways that reflect the theme "Transcending Borders".

We would also like to thank all of our participants and congratulate all the winners of the 2015 competition. We are already looking forward to the next exciting edition of the Copernicus Masters, which is scheduled to run from April to July 2016.

Thorsten Rudolph
Managing Director
Anwendungszentrum GmbH Oberpfaffenhofen

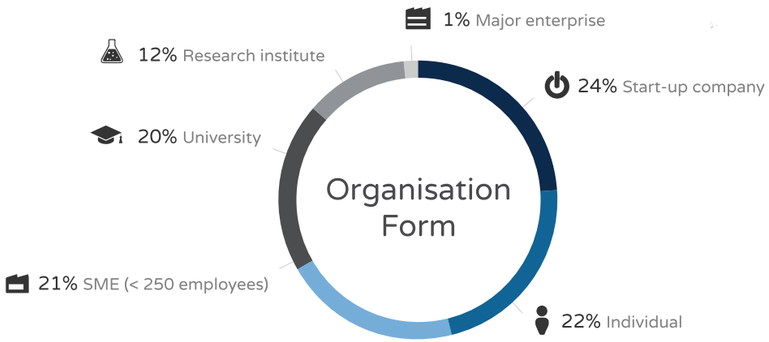
APPLICATION FIELDS

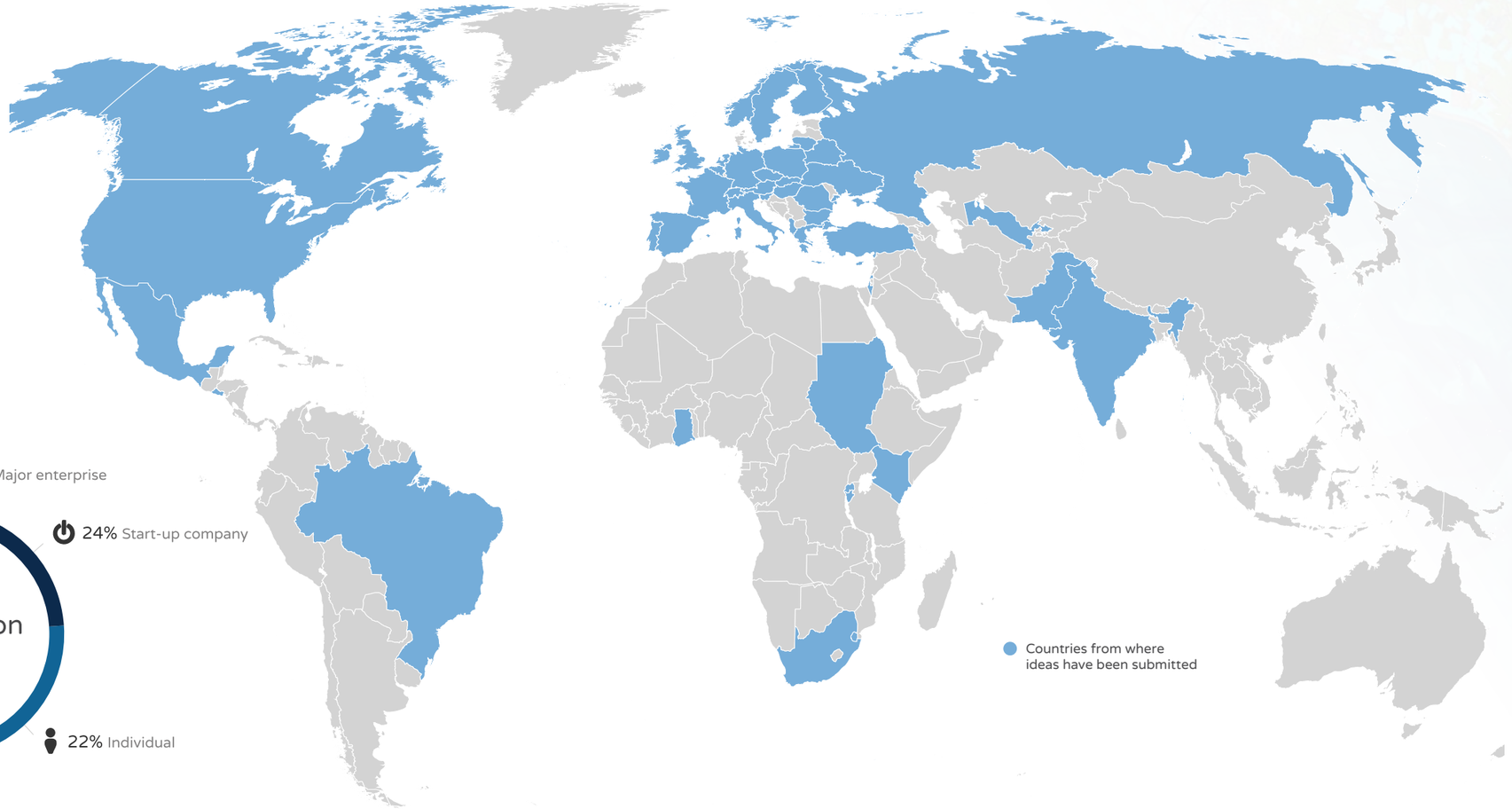
Earth observation holds a huge potential for the creation of innovative products and services. Myriad fields stand to profit from the advances of the Copernicus programme including an array of industries and areas of public interest.



STATISTICS

Already in its fifth year, the Copernicus Masters has once again affirmed the growing importance of Earth observation in virtually every sphere of our daily lives. The 208 submissions received from close to 50 countries in 2015 offer an exciting glimpse into the future of EO services. Now meet this year's winners and learn everything about the drivers of innovation in the global Earth observation market.





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UNIVERSITY 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. 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. In 2015, the University Challenge was kindly supported by the Group on Earth Observations (GEO).

Anwendungszentrum GmbH Oberpfaffenhofen
Lara Schaflinger, lara.schaflinger@anwendungszentrum.de
www.anwendungszentrum.de

THE PRIZE

- Along with a EUR 1,000 cash prize, the winner will receive a consulting package he can use to develop the idea into a valid business case, with the aim of qualifying for one of the 11 ESA Business Incubation Centres across Europe. Corresponding incubation packages are valued at up to EUR 50,000.
- The winner will benefit from a substantial satellite data quota worth EUR 20,000 made available with financial support by the European Commission.
- Moreover, the Group on Earth Observations will invite the winner to attend the GEO-XII Plenary Meeting in Mexico City, November 2015, where he has the possibility to present his winning service to the audience.

THE EXPERTISE

"*Foresight Crops* is a service that uses a combination of the latest satellite data provided by Copernicus' Sentinel-2, in-situ data, and crowdsourced data. What makes it outstanding is the direct benefit it offers end users: Facilitated by Earth observation data (using open standards) from satellites, insect swarm prediction will help protect farmers against damaged crops and resulting losses of income."

Bart de Lathouwer
Director, Interoperability Programs
Open Geospatial Consortium

THE WINNER

FORESIGHT CROPS – INSECT SWARM PREDICTION MODELLING

Foresight Crops is an insect swarm prediction application. It utilises satellite data and ground observations to model and predict swarms of locusts and other insects that destroy crops around the world. Farmers benefit from reduced crop damages and less environmental impact thanks to more targeted use of pesticides. Satellite data will be used to compute the Normalised Difference Vegetation Index (NDVI) and Soil Moisture Index (SMI), which will be used in an algorithm to indicate the areas at high risk of swarm activity.

© O. Ogundipe

Historical satellite data will be correlated with swarm records and analysed to model long-term trends and probability estimates in swarming patterns. Along with crowdsourced observations from local farmers, Sentinel-2 and -3 satellite imagery and weather data will be used to provide information on active swarm locations. SMS alerts and warnings can be activated for affected farmers, who can also request expert advice through the application.

Dr Oluropo Ogundipe
University of Nottingham, United Kingdom
ropo.og@gmail.com

Foresight Crops

How can satellites predict harmful insect swarms in support of global food security?

ESA APP CHALLENGE

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. While the Copernicus programme is politically led by the European Union (EU), ESA is the overall coordinator of the Copernicus Space Component and will, inter alia, develop a dedicated series of satellites (the Sentinels) and coordinate the uninterrupted delivery of data from these satellites and from other Contributing Missions.

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

THE PRIZE

- The winner will be awarded a support package tailored to the winning app: this can include tech support, design support, app marketing, and other services valued at EUR 10,000 in total.
- The winner will also have the chance to develop his idea further at one of the 11 ESA Business Incubation Centres (BICs) across Europe. These incubation packages are worth up to EUR 50,000.
- Moreover, the winner will benefit from a substantial satellite data quota worth EUR 20,000 made available with financial support by the European Commission.

THE EXPERTISE

"*Wave* combines satellite information and localisation technologies into a pocket-size tool that serves as your own personal guide. Among other advantages, the app offers information on using green means of transport, barrier freedom, air quality, and insider tips. As more Sentinels become operational, Wave also has tremendous potential to integrate further satellite data."

Dr Thomas Beer
European Space Agency (ESA)
Copernicus Policy Coordinator

THE WINNER

WAVE – THE CITY ASSISTANT

Wave is an iOS voice assistant app that answers city-related questions including information derived from EO satellites. Voice assistants answer questions asked in natural language, which makes them intuitive and allows for semantic searching and usage by visually impaired users. They are also faster than touch interfaces in many scenarios, as users can specify what they want to know more precisely without having to work through a complicated interface. Wave uses open data sources to answer questions. Users can ask things such as "Where can I swim?", "How is the air quality today?", or "Where can I get a city bike?" and receive a spoken and visual answer (such as a map or bar chart). The app will supplement its answers with Copernicus data and recommends sunscreen when UV radiation is high or warns of pollen when the user wants to bike.

Patrick Wolowicz
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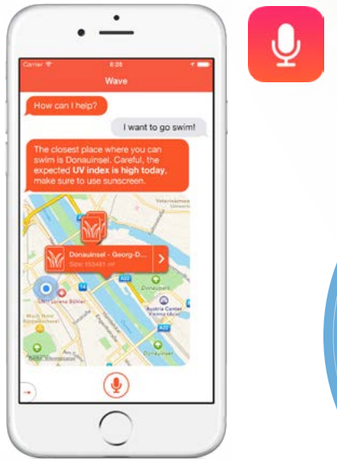

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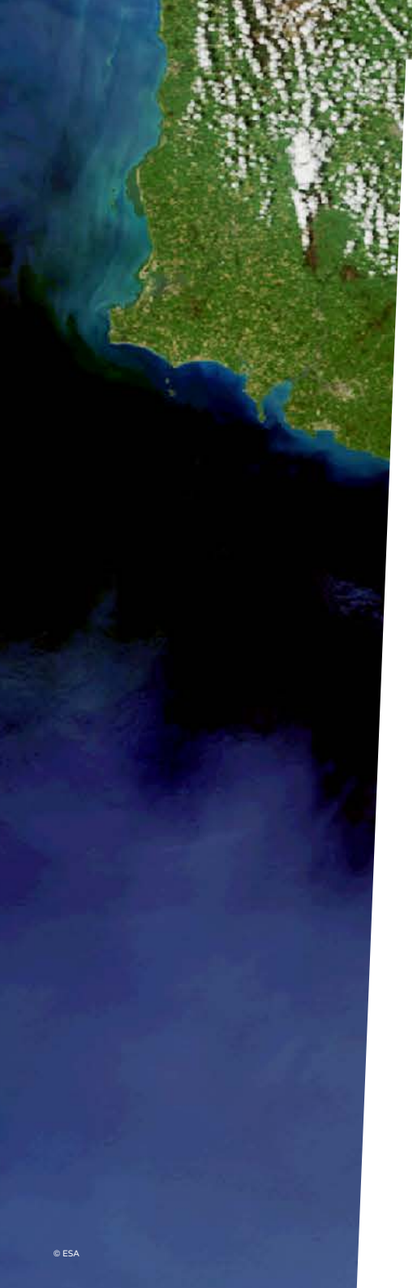
How can Earth observation data be of use in the management of smart cities?



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DLR ENERGY & ENVIRONMENTAL CHALLENGE

DLR is Germany's national research center for aeronautics and space. DLR also hosts the Earth Observation Center (EOC), comprised by the German Remote Sensing Data Center (DFD) and the Remote Sensing Technology Institute (IMF). The EOC is involved in many aspects of Copernicus design, implementation, and operations. In determining the focal points of its research, DLR is to a large extent guided by the demand for innovative products and services developed in close cooperation with industry. It also invests in promising technologies and offers its research and development capacities to partners for their own use.

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

THE PRIZE

DLR was looking for new applications in Earth observation that address climate and mapping of the environment. The winner will be rewarded with a cash prize of EUR 5,000 for use in further developing the winning application.

THE EXPERTISE

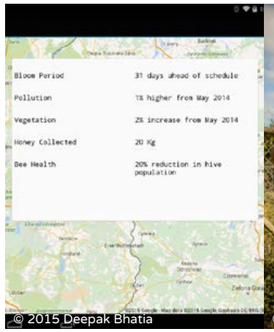
"Bees play a vital role for crops and wild plants and thus have a major effect on food security and the preservation of biodiversity. The rising bee mortality rate is a warning signal. *Beehive Locations* offers web-based information on environmental conditions using a variety of Sentinel data, which helps beekeepers identify and monitor the most suitable locations for their bees."

Claus Kumutat
President
Bayerisches Landesamt für Umwelt

THE WINNER

BEEHIVE LOCATIONS – MONITORING HABITATS WITH SATELLITE DATA

This cloud-based, data-powered platform crowdsources beehive data from beekeepers. It also uses Earth observation data from the Sentinel satellites such as on patterns of land use and cover, pesticide levels, and other farmland pollution – to determine the best areas and locations for growing and cultivating beehives. Bees play an extremely important role in the global food supply chain, including in a large part of fruit and vegetable pollination. The current bee population is at risk, however, due to climate variations and the use of pesticides. This platform mainly seeks to give beekeepers information on the suitability of areas for beekeeping while factoring in farmland use and cover, pesticide levels, and other pollution. Those that find their current location unhealthy for bees can thus move their hives to a more suitable area.



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Deepak Bhatia, Poland
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How can satellite data help ensure the survival of beehives?

T-SYSTEMS BIG DATA CHALLENGE

T-Systems International GmbH operates information and communication technology for multinational corporations and public institutions. The Deutsche Telekom subsidiary is also a leading supplier of cloud computing and enables customers to use ICT resources via the Internet as and when they need them, only paying for what they use. In the future, Copernicus services will be available in completely new dimensions through the use of extensive monitoring data from space and sensor networks that can be processed in near-real time. Providing such future Copernicus services to a wide variety of users and industries will entail building on big data and cloud computing technologies to create commercially attractive and sustainable services.

T-Systems International GmbH
Dr Jurry de la Mar, jurry.delamar@t-systems.com
www.t-systems.com

THE PRIZE

T-Systems International GmbH will assist the winner in getting their project off the ground. This will include assistance in realising an innovation project, which could lead to a long-term partnership.

How can **near-real-time analysis** of big EO data facilitate simplified, yet augmented image comprehension?

THE EXPERTISE

"*ImageQuerying* is an innovative application that simplifies and accelerates the analysis of big EO image data. The images and image time-series are automatically pre-classified and stored in a raster database, thus allowing users to perform geospatial semantic queries on large EO archives via an easy-to-use interface. The application quickly transforms image data into information, creating real value for the customer."

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

THE WINNER

IMAGEQUERYING – REAL-TIME IMAGE ANALYSIS AND QUERYING

To deal with the massive acquisition of satellite data in rapidly growing image archives, ImageQuerying (IQ) offers an innovative, near-real-time image comprehension and querying system for EO big data. Based on low-level computer vision, IQ provides each image stored in a database with at least one thematic map generated through a fully automated process. Image objects can be tracked by the IQ inference engine over time in a manner resembling symbolic human reasoning. Users can also generate information layers by querying and combining the maps stored in the database. The ImageQuerying system can process any airborne/spaceborne EO multi-spectral image with a radiometric calibration metadata file. Cross-domain academic, public, or commercial users of Earth observation imagery – as well as data providers – will benefit from ImageQuerying as a real-time visual tool for mining EO big data with autonomous image-interpretation intelligence complementary to that of the operator.

Dr Dirk Tiede, Dr Stefan Lang, Dr Mariana Belgiu, Martin Sudmanns
Department of Geoinformatics – Z_GIS, University of Salzburg, Austria
Andrea Baraldi
Department of Geoinformatics – Z_GIS, University of Salzburg, Austria & Department of Agricultural and Food Sciences, University of Naples Federico II, Portici (NA), Italy
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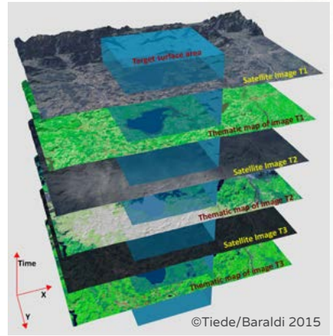


UNIVERSITY of SALZBURG Z_GIS

SMART CITIES AND INTELLIGENT TRANSPORT CHALLENGE BY THE SATELLITE APPLICATIONS CATAPULT

The Satellite Applications Catapult is an independent innovation and technology company, created to foster growth across the economy through the exploitation of space. It helps organisations make use of and benefit from satellite technologies, and brings together multi-disciplinary teams to generate ideas and solutions in an open innovation environment. The Satellite Applications Catapult is one of a network of centres established by Innovate UK, the UK's innovation agency, to accelerate the take-up of emerging technologies and drive economic growth. A not-for-profit company, the Catapult provides facilities, platforms and expert knowledge to enable the translation of ideas from concept to market.

This Challenge is also supported by:

Innovate UK Technology Strategy Board

UK SPACE AGENCY

Satellite Applications Catapult
Stephen Spittle, info@sa.catapult.org.uk
www.sa.catapult.org.uk

THE PRIZE

The winning proposal will be awarded a Catapult support package (valued at EUR 10,000) tailored to the requirements of the winner. This includes one or more of the following benefits:

- Direct access to the Catapult's in-house expertise (technical and business support).
- Access to the Catapult's professional facilities (operations centre, 28-panel videowall and 3D facility, spark centre and meeting room facilities).
- Access to the cloud computing facility CEMS (Climate and Environment Monitoring from Space).

THE EXPERTISE

"Every year, flood events in cities around the world cause loss of life and massive infrastructure damage leading to costly repair programmes. Whilst the use of satellite data for flood monitoring and prediction is increasing, there has been less focus on its application for flood drain effectiveness. *eXude* uses Sentinel and commercial data sets to monitor and model the drainage capabilities of a flood zone to determine whether current systems are effective, providing valuable information to local authorities and civil infrastructure owners for flood defence management."

Stuart Martin
Chief Executive Officer
Satellite Applications Catapult

THE WINNER

EXUDE – FLOOD MONITOR AND DRAIN EFFECTIVENESS

Flood events are on the rise internationally and affecting a greater number of people and properties each year. The need for effective flood-monitoring tools has thus never been higher. Currently, satellite-based systems primarily use single-intensity images to map the extent of floods in rural and other sparsely populated areas. Astrosat's flood monitoring tool, eXude, utilises a multitude of spacebased radar assets (SAR and altimetry) to provide flood mapping in urban areas for the first time and monitor how effective drainage systems are in removing water. By combining data from these multiple radar sources (and linking it with metadata), better situational awareness of floods – in areas previously inaccessible to satellite scans – can be achieved, leading to smarter decisions.

© Stevenson Astrosat

Steve Lee
Stevenson Astrosat Ltd., United Kingdom
info@astrosat.biz, www.astrosat.biz

ASTROSAT

How can satellite data enable **augmented monitoring and modelling** of flood drainage systems?

How can satellite data help augment reality on mobile devices?

NCMA SPATIO-TEMPORAL DATA VISUALISATION CHALLENGE

The National Cadastre and Mapping Agency (NCMA) of Greece is a state-owned entity tasked with establishing the Hellenic National Cadastre and developing the country's geospatial information infrastructure. NCMA has one of the most modern, advanced, comprehensive, and extensive spatial data infrastructures in Greece, which it uses to establish the cadastre (a EUR 1.4 billion project), map the country's forests, and support other state authorities in carrying out their designated tasks (e.g. detecting unauthorised construction, developing and updating the CORINE Land Cover database, delineating NATURA 2000 areas, geo-referencing institutional spatial information). By recognising the importance of effective cartographic visualisation in everyday works and applications, NCMA fosters the development of innovative information technologies that facilitate the widespread use of available 3D spatio-temporal data in the world of business.

National Cadastre and Mapping Agency (NCMA)
Dr Panagiotis Lolonis
plolonis@ktimatologio.gr
www.ktimatologio.gr/sites/en

THE PRIZE

The winner will be awarded a cash prize of EUR 5,000, coaching to develop his idea further, and access to sample spatial data from the Athens Metropolitan Area to demonstrate the idea or application.

THE EXPERTISE

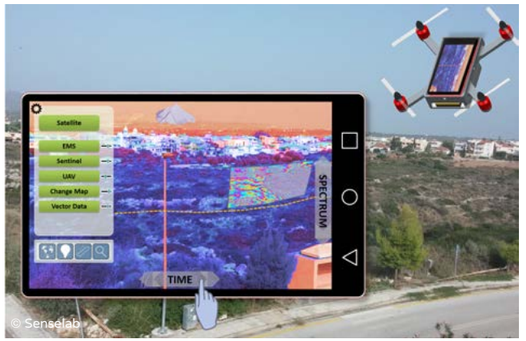
"*CybEarth's* ability to adaptively augment Earth observation data (as well as other data stored in central databases) with vertical and/or oblique scenes viewed on mobile devices in the field and, in addition, interactively annotate them with key features indicated by users in the field, is a major development in cartographic visualisation and opens-up the door for more extensive use of EO data in real-life applications."

Dr Panagiotis Lolonis
National Cadastre and Mapping Agency S.A.
Member of the Scientific Council

THE WINNER

CYBEARTH – FIRST-PERSON VISUALISATION OF EO DATA

CybEarth is a mobile app that provides augmented first-person views of reality. By positioning a mobile device over an area, layers of spatial data and Earth observation imagery are projected on-screen and dynamically matched to the camera's tilted field of view. The user can navigate in spectral and temporal scales and add geo-tags. The mobile device can be adjusted on a prototype UAV platform to integrate real-time image data. The app incorporates any type of spatial information, including Sentinel SAR, multispectral, vector, and sensor data. CybEarth introduces a novel generic platform that embraces most EO applications, including sea-, land-, and air-based environmental monitoring for violation reporting, natural disaster assessment through comparison of changes over time, and agriculture phenology. This promotes understanding of and participation in events on Earth.



Asst Prof Panagiotis Partsinevelos and Team
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CLOUDEO – THE GOING LIVE CHALLENGE

CLOUDEO

CloudEO is a unique portal for all those who create, interpret, and use geo-data. It offers its customers a secure and highly scalable geo-infrastructure for developing, producing, and marketing geo-services. The portal also combines data, software, and processing power within a private cloud service and certified hosting environment. On CloudEO's geo-collaboration platform, content providers, software developers, service providers, and geo-data users become partners within a single ecosystem that provides affordable geo-services for commercial applications.

CloudEO AG
Emmanuel Mondon, emondon@cloudeo-ag.com
www.cloudeo-ag.com

THE PRIZE

The winner will have the opportunity to test and implement his application using all of CloudEO's capabilities. The prize also consists of free resources valued at up to EUR 10,000 – including six months of access to a free standard workbench for development and production on CloudEO, marketing support through the CloudEO web store, and active business support from CloudEO.

How can UAVs and Earth observation satellites help us achieve more effective food production?

THE EXPERTISE

"*Gamaya* is a fine example of a well conceived, end-to-end business concept that will provide highly valuable services to the farming industry. The team behind it has developed a leading-edge hyperspectral sensor that is embedded in a fully integrated, cloud-based service solution. Together with its partners, Gamaya is well positioned for successful market entry. CloudEO is thus excited to present the team with the CloudEO Going-Live Award and looks forward to supporting its launch."

Dr Manfred Krischke
CloudEO AG
CEO

THE WINNER

CROP ANALYTICS – THE FUTURE OF FARMLAND DIAGNOSTICS

The world's population will reach 10 billion people by 2050. This presents an urgent and widely recognised need for farmers to increase food production by 70%. To meet this challenge, Gamaya is developing an innovative comprehensive framework for large-scale farmland analytics. Through integration of a novel hyperspectral imaging camera and algorithmic expertise, it translates data from the camera into actionable information for agricultural businesses. Gamaya deploys the camera on drones and relies on synergies with Sentinel satellites to provide agronomists and farmers with timely and large-scale diagnostics on crop issues. The solution empowers farmers to achieve significant economic gains, including a 30% increase in yield, a 40% decrease in costs, and a 70% decrease in disease-related risks, all of which reduces negative impacts on the environment.

Nicolas Ackermann, Igor Ivanov, Yosef Akhtman
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www.gamaya.com

GAMAYA

EUROPEAN SPACE IMAGING HIGH-RES URBAN CHALLENGE

European Space Imaging (EUSI), a leading supplier of very high-resolution (VHR) satellite data across Europe and North Africa, provides access to the most advanced VHR satellites available. As owner and operator of a multi-mission European ground station with an uplink and downlink to the WorldView constellation they enable optimised collection strategies, flexibility and real-time weather assessments for new collections. EUSI is an active supplier to the Copernicus services of globally acquired imagery and derived information.

European Space Imaging GmbH
info@euspaceimaging.com
www.euspaceimaging.com

THE PRIZE

The winner will be awarded a European Space Imaging (EUSI) data package of very high-resolution satellite data imagery with a commercial value of up to EUR 20,000 for use in further developing the winning application.

How can **suppliers of construction projects** around the world take advantage of satellite imagery?

THE EXPERTISE

"The start-up *Building Radar* presents an integrated solution for VHR satellite imagery within a solid business model. It is focused on providing automated monitoring and detection services for the construction industry, whereby satellite imagery will be incorporated within the solution for the validation and monitoring of the building progress or for the detection of new construction sites. This solution may open new doors for the use of precision satellite imagery in a worldwide context."

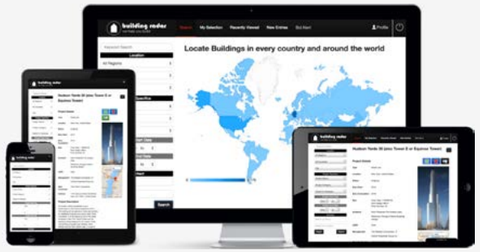
Adrian Zevenbergen
European Space Imaging GmbH
Managing Director

The Earth Monitoring Competition
Copernicus masters
COPERNICUS MASTER 2015

THE WINNER

BUILDING RADAR – CONSTRUCTION DETECTION AND MONITORING

Building Radar is an intuitive, user-friendly platform that reports on construction projects worldwide. The projects are automatically detected, updated, and enhanced by the unmatched, satellite-supported search algorithm. The use of computer vision algorithms on VHR satellite imagery enables Building Radar to verify lead specifics such as construction phase, construction type, and building size. In combination with the search algorithms, this helps to supply real-time intelligence on commercial real estate. Customers include companies that sell products or services linked to the construction or maintenance of buildings and other stakeholders in commercial real estate. The market for construction sales leads alone amounts to USD 80 billion. Founders of Building Radar are alumni of LSE, Cambridge, TUM and CDTM and have professional backgrounds at Google and Cliqz.



© Building Radar

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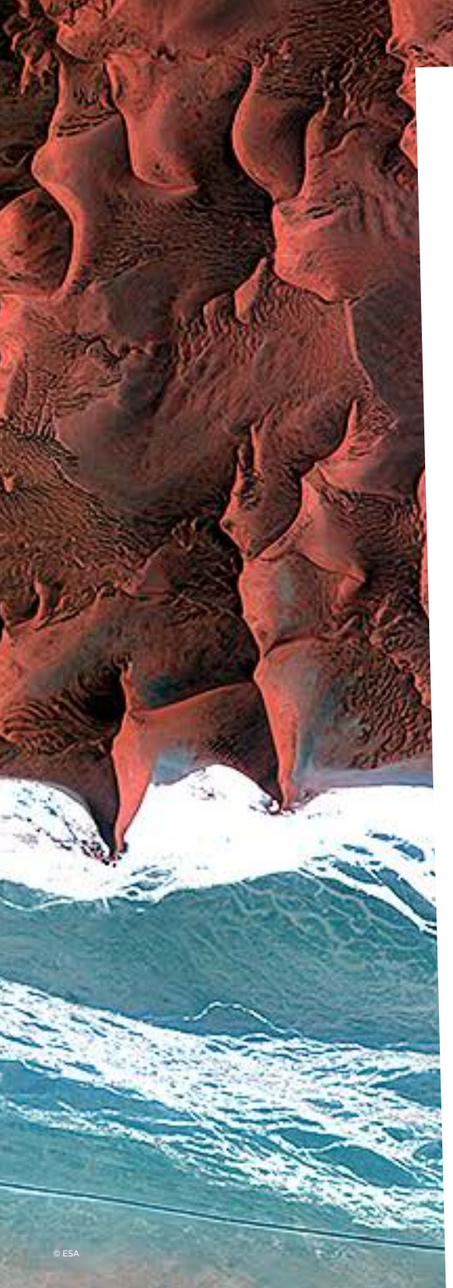
building radar



GEO ILLUSTRATION CHALLENGE

In its international illustration challenge, GEO magazine was asking participants to give our planet a new face. The theme was “Transcending Borders – and Changing the Earth’s Image”. GEO magazine has been published monthly by the German publishing house Gruner + Jahr for 37 years. Its opulent photo coverage and exciting, impeccably researched reports on science, nature, and humankind have made it the most respected German-language reportage magazine and one-of-a-kind in Europe. It currently appears in a total of 17 countries.

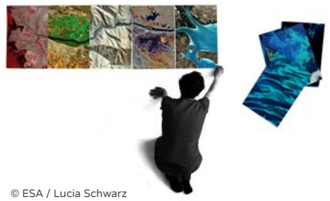
GEO Magazin
Gruner + Jahr AG & Co. KG
Jürgen Bischoff
briefe@geo.de, www.geo.de

THE PRIZE

- The finalists were presented at www.geo.de as part of an additional audience award competition from 10 August to 4 September 2015.
- The top three entries chosen by the jury will be published in GEO (including all of its international editions) and compensated accordingly by the magazine.
- In addition, the overall winner received a VIP invitation from GEO and ESA to a 2016 Sentinel satellite launch at Guiana Space Centre in French Guiana.

2ND Place, Tatjana Stephanowitz, Germany
Mount Fuji – The line between tradtion and modern

3RD Place, Lucia Schwarz, Austria
The Rivers Flow



THE WINNER

TWO HALVES OF ONE HEART

Juárez (Chihuahua, Mexico): Densely populated by workers
El Paso (Texas, USA): Major industrial location

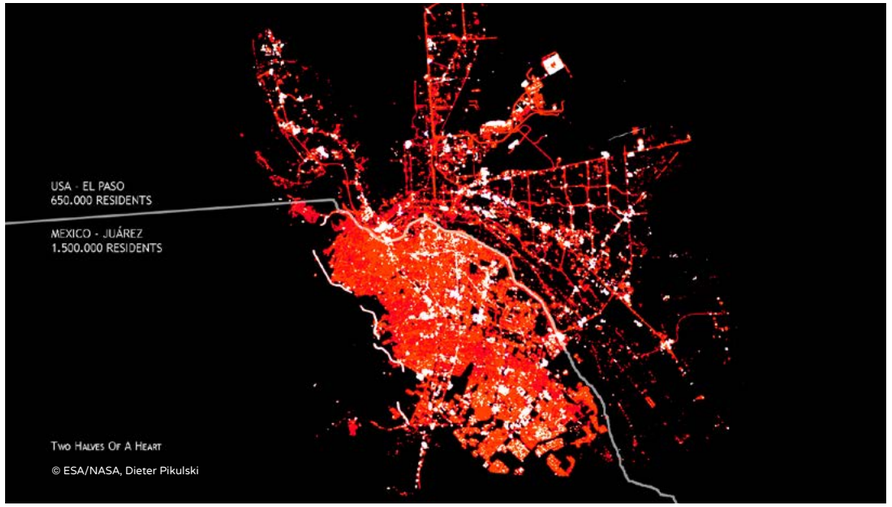
Though they couldn’t be more different, these two cities share a symbiosis and mutual dependency. Obviously, one cannot be without the other. Divided by the Rio Grande, Juárez and El Paso are two halves of one anatomic, pulsating heart. Everyday life is transcending borders. Four bridges are the most important points of access for emigration, immigration, goods, money, drugs, energy, crime, weapons, labour, partner ships, and more.

Is industry conditional upon labor resulting in employment?

Do nations’ needs promote exploitation, along with all its consequences?

What type of heart do we want to power the world?

Dieter Pikulski, Germany



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VOICES FROM PREVIOUS YEAR'S WINNERS

IDEAS CHALLENGE WINNER 2014 – CYANOLAKES

"Entering and winning the Ideas Challenge of the Copernicus Masters competition had a profound impact on the founding of CyanoLakes as a company. The positive feedback gave me the confidence to believe in the idea and to set out and start a company. The excellent business training I received during the competition enabled me to improve my idea further and introduced me to essential business concepts I had never been exposed to before as a scientist. CyanoLakes was registered as a company in February 2015 in Cape Town, South Africa. Since then, it has officially been open for business, engaging with clients in South Africa and abroad, and increasingly seeking to service the needs of clients around the globe."

Dr Mark Matthews, Cyanolakes

BMW CONNECTEDDRIVE CHALLENGE AND OVERALL WINNER 2013 – LANDMARK NAVIGATION

"Winning the Copernicus Masters brought my idea for radar landmark navigation a great deal of publicity. It also gave me the chance to collaborate with the autonomous driving developers at BMW and learn more about the automotive industry's exact requirements in this emerging field. This in turn helped me secure funding from the Helmholtz Association for a research project involving the validation of the technology we've developed. We've since registered both the name of our project, DriveMark®, and the term EO4Car® ("Earth Observation for Cars"), which are to become trademarks for the generation of highly accurate maps for autonomous driving based on remote sensing data."

Hartmut Runge, German Aerospace Center (DLR)

TRANSPORT AND LOGISTICS CHALLENGE BY SATELLITE APPLICATIONS CATAPULT WINNER 2014 – TRANSPORT SENTRY

"The Copernicus prize was a milestone for our company Astrosat, which has demonstrated its impressive capabilities in Earth observation, satellite communications, and hardware development since its inception. Our Edinburgh-based company has transformed the way space-based information can be used to bring previously unattainable benefits to energy, transport, and aquaculture enterprises. It is also engaged in technology transfer and creating innovative spacecraft systems."

Steve Lee, Stevenson Astrosat

T-SYSTEMS INTERNATIONAL CLOUD COMPUTING CHALLENGE WINNER 2011 – URTHECAST

"Winning the Copernicus Masters award introduced us to the industry in the best way possible. It placed us in front of the likes of ESA very early in our lifespan, while allowing us to showcase our go-to-market strategy, our vision for EO data, and our cloud computing strategy — all in front of the industry's leaders. In 2015, UrtheCast has entered into a definitive agreement with Elecnor, S.A. to acquire the Earth observation business, Deimos. UrtheCast will soon acquire Deimos ownership, operation of the Deimos-1 and Deimos-2 satellites, and the Deimos global archive of Earth imagery."

Scott Larsen, UrtheCast

CLOUDEO FARMING CHALLENGE WINNER 2014 – FIELDSENSE

"Participating in the Copernicus Masters allowed us to establish new partners to help further develop the app and widen our network; one key partner that came from this is CloudEO. In 2015, the company Ceptu was founded and was one of the first companies to be accepted in HatchIT, Aarhus University's new incubator for technology companies and has also been accepted in the SmartAgriFood accelerator. Currently, we have 15 test sites installed all over Europe to test our application before the final realisation in mid-2016. It also planned to expand the company and find new investors until January 2016."

John Smedegaard, Ceptu

IDEAS CHALLENGE AND OVERALL WINNER 2011 – EARTHWATCHERS

"DeforestAction Earthwatchers, which won the Ideas Challenge and the competition's overall prize in 2011, is evolving well. The service is now integrating Sentinel-1 imagery to further improve the visual observation of felled trees. Typically only suited to experts, this imagery is prepared by rendering different polarisations to enhance visual forest analysis. Sentinel-1 provides good resolution, cloud-free data, and high-frequency updates – a perfect fit for the needs of the forest monitoring tool. The processing of the Sentinel-1 data is being carried out in cooperation with ESA's Scientific Exploitation of Operational Missions (SEOM) element."

Eduardo Dias, Earthwatchers

ABOUT COPERNICUS

Copernicus is the most ambitious Earth observation programme to date. It will provide accurate, timely and easily accessible information to improve the management of the environment, understand and mitigate the effects of climate change and ensure civil security. This initiative is headed by the European Commission (EC) in partnership with the European Space Agency (ESA).

ESA coordinates the Copernicus Space Component, including the delivery of data from upwards of 30 satellites. The EC, acting on behalf of the European Union, is responsible for the overall initiative, setting requirements and managing the services.

ESA is developing a new family of satellites, called Sentinels, specifically for the operational needs of the Copernicus programme. The Sentinels will provide a unique set of observations and, together with data from the Copernicus Contributing Missions at national, European and international level, will serve users with satellite data in an uninterrupted and timely fashion. The Space Component serves users with satellite data available through the Sentinels and the Copernicus Contributing Missions. The ground segment, facilitating access to Sentinel and Contributing Mission data, completes the Copernicus Space Component.

Copernicus provides a unified system through which vast amounts of data are fed into a range of thematic information services designed to benefit the environment, the way we live, humanitarian needs and support effective policy-making for a more sustainable future.

In essence, Copernicus will help shape the future of our planet for the benefit of all. ESA is contributing by providing a proven framework for the development of operational systems on behalf of the user community, paving the way for investment in future generation systems. ESA is exploiting its 30 years of expertise in space programme development and management to contribute to the success of Copernicus.

Sentinel-2 © ESA/ATG medialab

Further information can be found at www.esa.int/copernicus or at www.copernicus.eu

Source: ESA

THE SPACE COMPONENT

The success of Copernicus will be achieved largely through a well-engineered Space Component for the provision of Earth observation data to feed into a range of services for monitoring the environment and supporting civil security activities. The Copernicus Space Component comprises two types of satellite missions, ESA's family of dedicated Sentinels and missions from other space agencies, called Contributing Missions. A unified ground segment, through which the data are streamed and made freely available for Copernicus services, completes the Space Component.

© ESA

The Sentinels will provide a unique set of observations, starting with the all-weather, day and night radar images from Sentinel-1A, launched on 3 April 2014 Sentinel-2 is designed to deliver high-resolution optical images for land services and Sentinel-3 will provide data for services relevant to the ocean and land. Sentinel-4 and -5 will provide data for atmospheric composition monitoring from geostationary and polar orbits, respectively. Sentinel-6 will carry a radar altimeter to measure global sea-surface height, primarily for operational oceanography and for climate studies. In addition, a Sentinel-5 Precursor mission is being developed to reduce data gaps between Envisat, in particular the Sciamachy instrument, and the launch of Sentinel-5.

Sentinel-2A was launched on 23 June 2015 and Sentinel-2B will follow in the second half of 2016. Sentinel-3A is expected to be launched in December 2015. Once launched, the European Commission assumes ownership of the satellites. A unified ground segment, through which the data are streamed and made freely available for Copernicus services, completes the Space Component.

Source: ESA

THE EXPERTS

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Thorsten Rudolph
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Christian Stammel
Navispace AG, CEO

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Andreas Knoche
GEO Magazine, Art Editor

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THE EXPERTS

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Dr Markus Lautner
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Michaela Neumann
European Space Imaging GmbH, Director Sales & Marketing

Triin Udris
Enterprise Europe Network, EU Funding & Partnering

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