

## RESULTS 2014

[www.copernicus-masters.com](http://www.copernicus-masters.com)



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

UPON THE INITIATIVE OF



T-Mobile Systems



CLOUDEO



CATAPULT  
Satellite Applications

ORGANISED BY





2014 is a special year: the space community is celebrating the 50<sup>th</sup> anniversary of the construction of European cooperation in space with many unique achievements. Furthermore, the successful launch of Sentinel-1A on 3 April started a new era – the operational phase of Copernicus. Soon it will be joined by further satellites designed to build up the new fleet of ESA Earth observation satellites. The wealth of data and imagery they are poised to transmit from space will open doors to countless potential applications along the entire value chain.

The huge potential Earth observation holds for the creation of innovative products and services is reflected in the impressive ideas presented in the Copernicus Masters competition. For high-tech start-ups and SMEs in particular, it takes time and effort to develop ideas from scratch and transform them into operational products. This is why I was excited to hear that a number of participants from the previous competitions have already made products out of their winning applications. This summer, for example, the 2011 ESA App Challenge winner EOMAP launched a new web-based application that provides daily maps of Australia's coastal water quality. Meanwhile, following its success in the Copernicus Masters 2012, the "Cerberus" project – an online game that incorporates very high-resolution satellite imagery and leverages crowd-sourcing to analyse big data – entered the ESA Business Incubation Center Noordwijk and in November 2013 helped to identify areas affected by Typhoon Haiyan in the Philippines. And finally, Geodan – the first overall winner of the Copernicus Masters – has announced that its cloud application for rainforest preservation, "DeforestACTION Earthwatchers", was recently exported to South America in partnership with Greenpeace Argentina. These examples of previous winners demonstrate the competition's ability to foster the development of value-added downstream services in various service domains of the Copernicus programme and thus stimulate economic growth in Europe.

My thanks go out to all of the supporters who have contributed to the success of the Copernicus Masters over the past four years. I am also pleased to see the innovative quality of this year's ideas, which further demonstrate the great potential just waiting to be tapped at one of Europe's 11 ESA Business Incubation Centres.



A handwritten signature in black ink, reading "Mordai".

Jean-Jacques Dordain  
Director General, European Space Agency (ESA)

## ABOUT THE COMPETITION

In its fourth year, the annual Copernicus Masters competition has once again affirmed the growing importance of Earth observation in virtually every sphere of our daily lives. The 171 submissions received from 43 countries in 2014 offer an excellent glimpse of the next generation of Earth observation services, which are set to benefit in particular from the expansion of digital infrastructures. The satellites now in orbit and the network development taking place here on Earth, for example, are expected to further accelerate the provision of current Earth observation data. Meanwhile, big data processing and the integration of additional real-time, ground-supported information, statistical data, and crowd-sourced information are facilitating the development of intelligent, dynamic services. Providing access to these IT services (e.g. in the cloud) will take Earth observation to the next level in terms of breadth of use. The myriad fields that stand to profit from these advances include an array of industries and areas of public interest, such as smart energy, environmental protection, finance and insurance, health and human services, infrastructures and networks, media, public safety and security, tourism, transport and logistics, surveying, weather, and world food supplies.

Since 2011, the Copernicus Masters has awarded prizes to innovative solutions for business and society based on Earth observation data. The 2014 edition, meanwhile, was the first to be carried out worldwide. This year's lineup of prominent partners – which includes the European Space Agency (ESA), the German Aerospace Center (DLR), T-Systems International GmbH, European Space Imaging GmbH & Skybox Imaging Inc., CloudEO AG, Airbus Defence and Space & Hisdesat S.A., and Satellite Applications Catapult Ltd. – have been awarding prizes valued at a total of EUR 300,000 in nine topic-specific categories.

More than 60 international experts from industry, research, and politics were entrusted with the evaluation of all submitted entries from July to September. From these entries, 26 finalists have been invited to pitch their ideas at eight Challenge evaluation meetings, as well as to the expert jury at an overall evaluation meeting. In addition to being recognised at the official Awards Ceremony in Berlin on 23 October, the winners were given the opportunity to present their ideas to the world's leading network for downstream satellite business at the first Satellite Masters Conference.

Our thanks go out to all of our participants and partners for their contributions and dedicated support of this year's Copernicus Masters. Finally, we would like to congratulate all the winners in the 2014 competition – we wish you all the best in realising your excellent services, products, and applications! We are already looking forward to the next exciting edition of the Copernicus Masters, which is scheduled to run from April to July 2015.



Thorsten Rudolph  
Managing Director



Ulrike Daniels  
Business Development



Lara Schafflinger  
Project Management



Lena Klemm  
Communication &  
Marketing

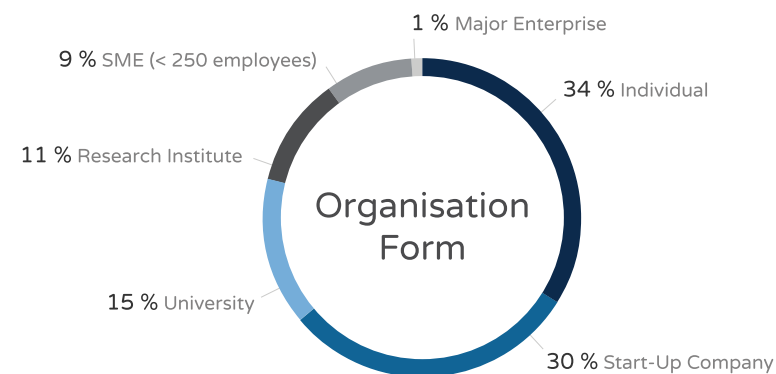
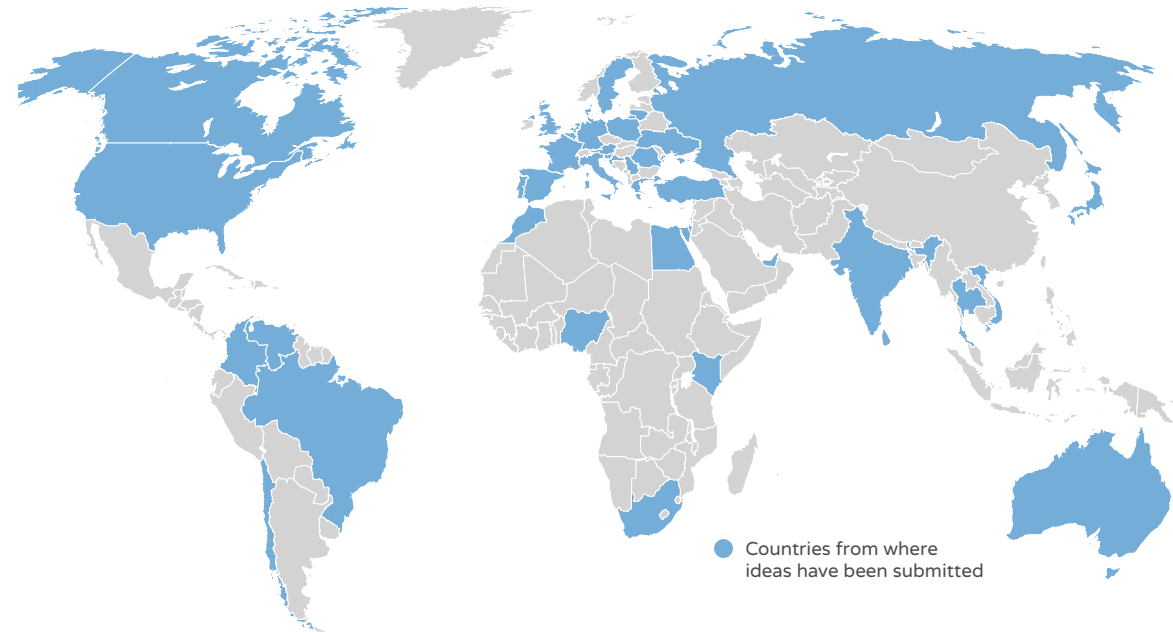


Mathias Kimbacher  
Art Director



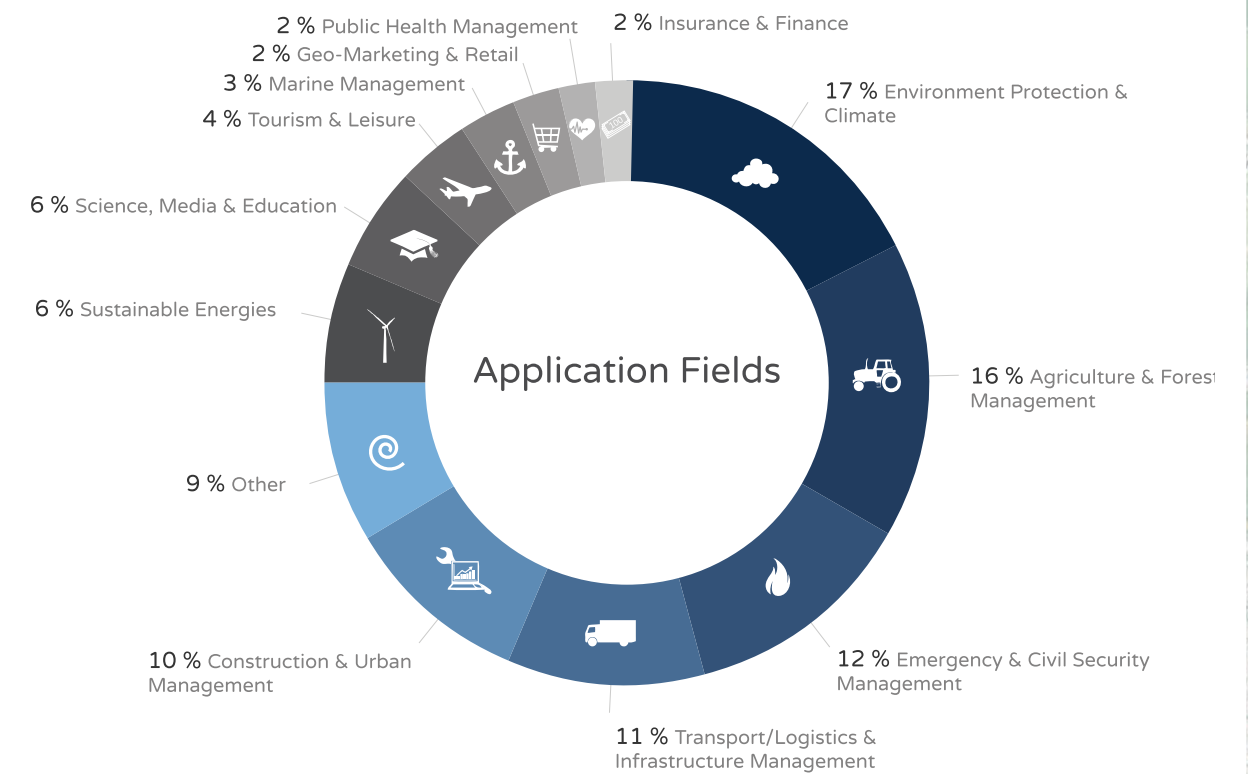
## STATISTICS

Already in its fourth year, the Copernicus Masters has once again affirmed the growing importance of Earth observation in virtually every sphere of our daily lives. The 171 submissions received from 43 countries in 2014 offer an exciting glimpse into the future of EO services.



## 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.





## 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. The Copernicus initiative is led by the European Commission (EC) in partnership with the European Space Agency (ESA), and the European Environment Agency (EEA). As the overall coordinator of the Copernicus Space Component, ESA is responsible (among a variety of other areas) for user access to data from the Copernicus Sentinels and more than 30 other Earth observation satellites.

The EEA, meanwhile, coordinates access to data from airborne and ground sensors. The EC, acting on behalf of the European Union, is responsible for the overall initiative, defining requirements, and managing the Copernicus services.

With the successful launch of Sentinel-1A on 3 April 2014 Copernicus has entered into its operational phase. Other Sentinels will follow into space over the next years 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. Copernicus provides a unified system through which vast amounts of data, acquired from space and from a multitude of in-situ sensors, 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.

Further information can be found at [www.esa.int/copernicus](http://www.esa.int/copernicus) or at [www.copernicus.eu](http://www.copernicus.eu)

Source: ESA



Sentinel-1 © ESA /ATG medialab

## SENTINELS

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 families of dedicated Sentinels and missions from other space agencies, called Contributing Missions. The Sentinels will provide a unique set of observations, starting with the all-weather, day and night radar images from Sentinel-1 to be used for land and ocean services. Sentinel-2 will 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 Sentinel-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.

Sentinel-1 will benefit numerous services. For example, services that relate to the monitoring of Arctic sea-ice extent, routine sea-ice mapping, surveillance of the marine environment, including oil-spill monitoring and ship detection for maritime security, monitoring land-surface for motion risks, mapping for forest, water and soil management and mapping to support humanitarian aid and crisis situations. The design of Sentinel-1 with its focus on reliability, operational stability, global coverage and quick data delivery is expected to enable the development of new applications and meet the evolving needs of Copernicus.

Sentinel-1A was launched on 3 April 2014 on a Soyuz rocket from Europe's Spaceport in French Guiana. It is planned to launch Sentinel-2A and -3A in the first half and second half of 2015 respectively.

A unified ground segment, through which the data are streamed and made freely available for Copernicus services, completes the Space Component.



Sentinel-2 © ESA /ATG medialab

Source: ESA



### The Expertise

“CyanoLakes is the first service that can distinguish harmful cyanobacteria from other algae. In offering relevant information in near real-time to subscribers worldwide via the cloud, it presents a great example of how to take research findings to commercial services. Exploiting Sentinel-3 will be the backbone of this cost-effective service.”

Mikko Strahlendorff  
Finnish Ministry of Transport & Communications  
Ministerial Adviser

The Ideas Challenge gave students, entrepreneurs, start-ups and SMEs a creative platform to initiate and design the most innovative and cutting-edge ideas using Earth observation data. For this Challenge all submissions were welcome which address any of the relevant application fields, including: Agriculture Management, Automotive, Emergency Management, Environmental Protection, Marine Monitoring, Mobile Applications, Renewable Energies, Tourism & Leisure. The evaluators focused on creativity and market needs rather than on the technological perfection and business case of the ideas submitted.

### THE PRIZE

The winner has been rewarded with a cash prize of EUR 1,000. Moreover, he shall receive a consulting package e.g. to further develop the idea into a valid business case with the aim to qualify for one of the 11 ESA Business Incubation Centres across Europe. The incubation package has a value of up to EUR 50,000.

### Contact

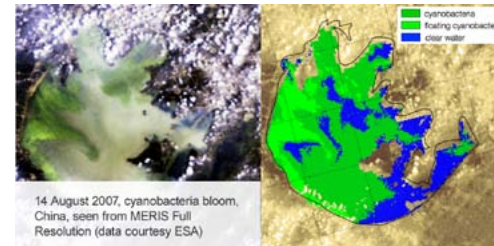
Anwendungszentrum GmbH Oberpfaffenhofen  
Lara Schaflinger  
lara.schaflinger@anwendungszentrum.de  
www.anwendungszentrum.de

### The Winner

## CYANOLAKES

### CYANOBACTERIA PUBLIC INFO SERVICE

An estimated one million lakes have been constructed in the last decade to meet the rising water demands of large cities and expanding populations. Both these lakes and natural freshwater bodies are threatened by the occurrence of harmful algal blooms caused mainly by cyanobacteria. The toxins produced by cyanobacteria blooms kill fish and have a severe impact on water ecosystems (and thus on human health). CyanoLakes is a public information and warning service for cyanobacterial blooms that makes use of Earth observation. It uses novel algorithms and cutting-edge research to differentiate between toxic cyanobacteria blooms and harmless algae. The service offers weekly updates, forecasts, and nowcasts (in near real-time) on cyanobacteria blooms through mobile applications. Designed as a tool to assist in the management of aquatic systems, this information will be made open to the public and available for aquatic systems around the globe. It will also benefit those who use such waters recreationally, such as for fishing, boating, and water skiing. CyanoLakes is tailored to the needs of each mobile subscriber at a fraction of the usual cost and will be available globally in near real-time from 2015.



CyanoLakes, South Africa  
Dr Mark Matthews  
mttmar017@myuct.ac.za



### The Expertise

“Conventional means of managing forests following major storms are resource-intensive, in part because they make use of helicopters and involve time-consuming on-site inspections. This is where the satellite-based app Fallen Trees comes in, providing assistance to quickly assess damage to forests and granting operators access to remove trees that are no longer standing.”

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

### The Winner

## FALLEN TREES

### STORM INVENTORY MANAGEMENT APP

The Fallen Trees mobile project monitors windthrown forests and addresses the acute need for inventory management when big storms strike. Satellite-based monitoring inherently covers large areas and offers a quick and efficient alternative to existing methods involving helicopters, light aircraft, UAVs, or drones. Being able to quickly obtain accurate damage assessments along with precise navigation for forest harvesting services is essential for owners, insurance companies, related authorities, and the forestry industry at large. The Fallen Trees app, based on technology newly available through the Copernicus Sentinel-1 satellite, offers an affordable and attractive forest monitoring and administration solution to an array of target groups.

The Code Company AB, Sweden  
Anders Wihlborg  
anders@codecompany.se  
www.codecompany.se



**C.O.D.E**  
THE CODE COMPANY AB

## THE EUROPEAN SPACE AGENCY (ESA)

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.

## THE PRIZE

The winner will receive an individualised support-package specific to his app (e.g. tech-support, design-support, app marketing and more) valued at EUR 10,000. Moreover, the winner has the chance to get his idea further developed in one of the 11 ESA Business Incubation Centres (BICs). The incubation package has a value of up to EUR 50,000.

### Contact

European Space Agency (ESA)/ESRIN  
Dr Thomas Beer  
thomas.beer@esa.int  
www.esa.int





### The Expertise

“The Global Seagrass Monitoring Initiative (GSMI) addresses the conservational monitoring of a plant that performs crucial functions in marine environments: seagrass. Using Earth observation data from the Copernicus Sentinels and other satellites, monitoring this specific type of ecosystem will provide decision support with regard to environmental protection and sustainable use of coastal environments.”

Gunter Schreier  
German Aerospace Center (DLR)  
Business Development & Copernicus, Deputy Director German Remote Sensing Data Center

### The Winners

## SEAGRASS MONITORING

### GLOBAL SEAGRASS MONITORING INITIATIVE

Seagrass ecosystems serve as sealife nursery grounds, wave protection, a source of oxygen, a buffer against coastal erosion, and more. While this makes them the third most valuable ecosystems in the world, new conservation strategies are needed to combat the dangers seagrass now faces. The major problem is that the distribution of seagrass is unknown, which is what the Global Seagrass Monitoring Initiative (GSMI) aims to rectify. It aspires to create a global network of NGOs, universities, and ecotourism businesses to analyse multi-spectral and hyperspectral imagery for seagrass mapping using a proven methodology. Using satellite data will allow for rapid, consistent, accurate, and repeatable mapping of seagrass distributions in order to assess degradation rates and the efficacy of restoration efforts while highlighting key conservation units. This is a vital step in ensuring the persistence of one of the world's most ecologically and economically important habitats.



Archipelagos Institute of Marine Conservation, Greece  
Dimosthenis Traganos, Samuel Matthews  
d.traganos@archipelago.gr, sammatthews990@gmail.com  
www.archipelago.gr

## GERMAN AEROSPACE CENTER (DLR)

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.

### THE PRIZE

The winner has been rewarded with a cash prize of EUR 5,000.

#### Contact

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





### The Expertise

"This scalable array engine enables fast and user-friendly big data analysis that is optimised for geo-information from satellites and other sources. Among other industries, it is designed for oil and gas and insurance. While the engine significantly reduces the volume of data transferred and processed in complex queries, such queries can also easily be managed thanks to their basis on international standards."

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

### The Winner

## RASDAMAN

### SCIENCE SQL ON PETABYTE DATACUBES

In today's data deluge, we are far from being able to understand all the data we gather. Traditional technology is limited to only those fixed questions foreseen by programmers. The Science SQL query language, meanwhile, enables users to ask any question at any time on multidimensional data cubes – concerning 1D series of measurements, 2D satellite images, 3D-image time series, or 4D climate data, for example. This concept is implemented in the rasdaman system, a next-generation big data engine which has heavily impacted international standards of Open Geospatial Consortium (OGC) and INSPIRE geo-services, and even ISO SQL. Rasdaman promotes science, but also allows companies to develop new business models. It can improve the flow of information between governments and citizens. Ultimately, rasdaman contributes to the worldwide democratisation of data access and joint data use on all levels.



Jacobs University, Germany  
Prof Dr Peter Baumann  
baumann@rasdaman.com  
www.rasdaman.org

## T-SYSTEMS INTERNATIONAL GMBH

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.

### 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.

### Contact

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





### The Expertise

“The proposed case study is addressing the monitoring of nuclear facilities and is based on a clear customer need to assist treaty verification. This is an excellent pilot study focusing on global security issues and aiming to build public awareness. The proposed methodology can easily be extended to sub-daily monitoring of all types of facilities.”

Adrian Zevenbergen  
European Space Imaging GmbH  
Managing Director

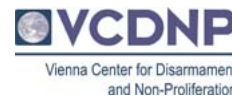
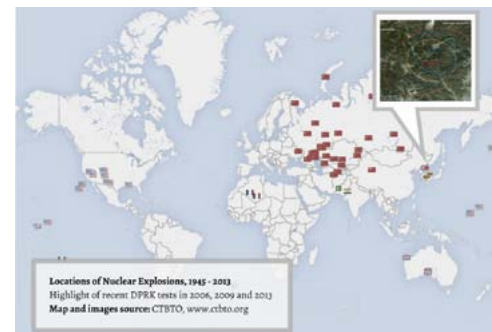
### The Winner

## NUCLEAR TEST SIGHT

### FREQUENT GLOBAL IMAGERY FOR NON-PROLIFERATION AND DISARMAMENT

This research showcase will help illuminate the unique opportunities for emerging high-res, sub-daily, wide-area commercial satellite imaging capabilities. It will thus support international security through an example application designed to monitor prohibited nuclear weapon-testing activities. An international community of experts will analyse Skybox imagery of a case-study test site in North Korea at a range of weekly, daily, and sub-daily intervals. In addition to raising public and media awareness of the value of new commercial high-res resources in ensuring international peace and security, this research will provide informative support to multilateral treaty organisations and stakeholders (possible future users of these tools) through verification and confidence building.

Vienna Center for Disarmament and Non-Proliferation, Austria  
Tamara Patton  
tpatton@vcdnp.org  
www.vcdnp.org



## EUROPEAN SPACE IMAGING GMBH & SKYBOX IMAGING INC.

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 the only European satellite imagery provider operating multi-mission capable ground stations they enable optimised collection strategies. EUSI is an active supplier to the Copernicus services of globally acquired imagery and derived information.

Skybox Imaging (Skybox) empowers global businesses to make better decisions with timely, high fidelity imagery and infinite analytics. By combining the power of web technologies and a constellation of high-resolution imaging satellites, Skybox is generating a unique data source describing daily global activity with timely, accessible, sub-meter colour imagery and high definition video of the Earth.

### THE PRIZE

The winner has been awarded a European Space Imaging data package of Skybox Imaging satellite imagery worth up to EUR 20,000 for use in further developing the winning application.

### Contact

European Space Imaging GmbH  
info@europeanspaceimaging.com  
www.europeanspaceimaging.com  
www.skybox.com





### The Expertise

“FieldSense has developed a great mobile tool that will provide farmers with easy-to-use and up-to-date services designed to support better farming operations. It is compelling in its simplicity and in the way it uses modern web technologies to put satellite remote-sensing services in the hands of a large number of end users.”

Dr Manfred Krischke  
CloudEO AG  
CEO

## CLOUDEO AG

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.

## THE PRIZE

The winner has been rewarded with a EUR 3,000 cash prize, 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.

### Contact

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

# CLOUDEO

### The Winners

## FIELDSENSE

### SIMPLE MONITORING OF CROP HEALTH USING SATELLITE DATA

FieldSense is a smartphone and tablet application that allows farmers to easily monitor the health of their crops. During the agricultural season, cereal crops, like any other crops, face a number of dangers, such as pest attacks, competition with parasitic plants, and health issues due to lack of nutrients. These lead to large drops in yield and lost revenue. FieldSense will offer farmers weekly updates on the health status of their crops. Farmers can use this information to make informed decisions about how to tackle crop health issues. FieldSense will use Sentinel-2 satellite data at its core. In particular, the application will use partly processed data supplied by satellite data distributors, which will be further developed into easy understand colour maps describing crop health status.

Ceptu, Denmark  
John Smedegaard and Team  
team@fieldsenseapp.com  
www.fieldsenseapp.com





### The Expertise

“By delivering precise surface movement maps at very high spatial and temporal resolutions, PUNNET provides a strong and innovative technical solution for geohazard monitoring. Its approach perfectly leverages the unique potential of the TerraSAR-X/PAZ constellation and the Sentinel-1 satellites.”

Dr Oliver Lang  
Airbus Defence and Space  
Head of SAR Monitoring Services

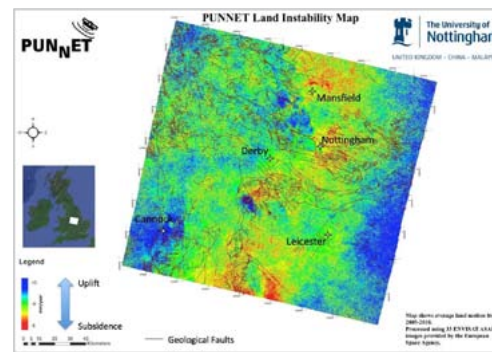
### The Winners

## PUNNET

### LAND STABILITY MONITORING & MAPPING

PUNNET is a satellite-based land stability monitoring and mapping solution for exploration, construction, and environmental protection industries. It represents a major step forward in land deformation monitoring for sectors such as oil and gas, mining, and exploration. The PUNNET service uses a series of images created from satellite data to create millimetric-precision maps of land surface deformation. It supports adherence to regulations and industry standards, including baseline surveys to assess site suitability for operations, post-operational surveys, and ongoing monitoring of active sites. PUNNET is an initiative of the University of Nottingham.

PUNNET GEO, United Kingdom  
Paul Bhatia and Team  
paul.bhatia@grace.ac.uk  
www.nottingham.ac.uk



## AIRBUS DEFENCE AND SPACE & HISDESAT S.A.

Pooling unique access to Earth observation satellite imagery with unmatched expertise and experience, Airbus Defence and Space is known as a world leader in geo-information. Hisdesat, an international provider of satellite services for government agencies, is currently developing new satellite capabilities for Earth observation and maritime traffic monitoring. The two companies will operate the Spanish PAZ satellite (built by Airbus, owned and operated by Hisdesat) together with TerraSAR-X and TanDEM-X in a constellation, thus providing customers with a wide range of benefits: significantly reduced revisit time, enhanced acquisition capacity, and easy ordering through one order desk.

## THE PRIZE

The winner was awarded a radar satellite data package worth EUR 25,000 and operational support to help advance their idea.

### Contact

Airbus Defence and Space  
Geo-Intelligence Programme Line  
[www.geo-airbusds.com](http://www.geo-airbusds.com)

Hisdesat Servicios Estratégicos S.A.  
[www.hisdesat.es](http://www.hisdesat.es)





### The Expertise

“Transport Sentry is an innovative infrastructure monitoring concept exploiting the capabilities of Sentinel-1 while reducing cost and fieldwork. The business offers significant potential, particularly for export to large countries with low population density.”

Stuart Martin  
Satellite Applications Catapult  
CEO and Executive Director

### The Winners

## TRANSPORT SENTRY

### “AFTER-EVENT” TRANSPORT INFRASTRUCTURE SCANNING

Extreme weather events caused by climate change are negatively affecting our transport infrastructure. Roads, rails, and so on can all suffer from disruptions due to landslides and other such interruptions to service. Given the widely dispersed nature of transport infrastructure – especially in countries with large landmass but low population density, such as Canada or Sweden – rapid identification of these disruptive events before they effect services can be difficult, particularly in ultra-rural areas. SAR and optical satellites offer the ability to rapidly examine “hot spots” pre-identified as potential problem areas by network operators and quickly report damage back to a transport infrastructure operator. Appropriate action can then be taken to minimise the disruption to the entire network and the end users who rely on it.



Stevenson Astrosat Ltd., United Kingdom  
Steve Lee and Team  
steve.lee@astrosat.biz  
www.astrosat.biz

## 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.

## THE PRIZE

The winning proposal was awarded a Catapult support package, worth £10,000. This will be a tailor-made package to support the requirement of the proposal. This includes one or more of the following benefits:

- › Direct access to the Catapult’s in house expertise (technical and business)
- › State-of-the-art facilities (operations centre, high definition videowall, spark centre and meeting room facilities)
- › Climate and Environment Monitoring from Space (CEMS) cloud computing facility

### Contact

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

**CATAPULT**  
Satellite Applications



## The Winners

## FIREHUB

## A SPACE-BASED FIRE MANAGEMENT HUB

In the framework of the BEYOND Centre of Excellence's monitoring of natural disasters based on Earth observation, the operational EO-based fire management service FireHub has been developed. The service consists of three pillars: a) 24/7 real-time fire detection and monitoring with a spatial resolution of 500m, b) large-scale burn scar mapping during and after wildfires that populates a unique diachronic inventory and observatory of fire events across Greece, and c) hourly fire-smoke dispersion forecasting. The service is freely available to end-users through a Web-GIS application (<http://ocean.space.noa.gr/FireHub>) and is transferable to diverse sites all over Europe. It is based on Earth observation of very high temporal and spatial resolution provided by Copernicus and contributing satellite missions.



National Observatory of Athens, Greece  
Dr Charalampos (Haris) Kontoes and Team  
[kontoes@noa.gr](mailto:kontoes@noa.gr)  
[www.space.noa.gr](http://www.space.noa.gr)



Anwendungszentrum GmbH Oberpfaffenhofen (AZO) is supporting innovation and incubation in the commercial use of space technologies & infrastructures:

## International Innovation Competitions



**Satellite Navigation**  
Since 2004, the ESNC is rewarding the best services, products, and business cases that use satellite navigation in everyday life.  
[www.esnc.eu](http://www.esnc.eu)



**Earth Observation**  
The Earth Monitoring Competition is awarding prizes to innovative solutions for business and society based on Earth observation data.  
[www.copernicus-masters.com](http://www.copernicus-masters.com)



**Service Robotics**  
The first international service robotics competition and its distinguished ESA BIC Start-up Award present prizes to outstanding innovations in service robotics.  
[www.robotics-masters.com](http://www.robotics-masters.com)



## Incubation Centers



**ESA BIC Bavaria**  
Business incubation for start-ups using space technology, applications, and services in a non-space environment.  
[www.esa-bic.de](http://www.esa-bic.de)



## App Developer Camps

In the App Camps, selected app developers are invited to learn how to integrate satellite data into their mobile applications and gain insight into Europe's space programmes.  
[www.app-camp.eu](http://www.app-camp.eu)  
[www.seamlesscities.app-camp.eu](http://www.seamlesscities.app-camp.eu)



## Network Events

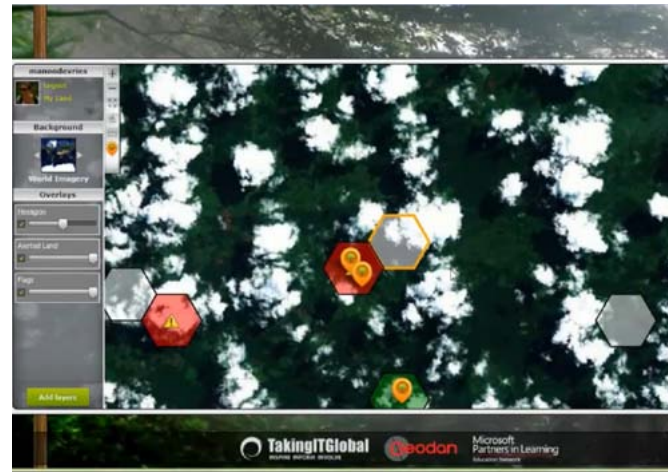
Organisation of conferences and other events in cooperation with key stakeholders in politics, research, and industry.  
[www.european-space-solutions.eu](http://www.european-space-solutions.eu)  
[www.satellite-masters-conference.eu](http://www.satellite-masters-conference.eu)





## DEFORESTATION

DeforestACTION Earthwatchers help preserve forests by monitoring and reporting on habitat destruction from the sky using a special cloud application created by Geodan. Participants from all over the world are able to “see” forest developments and changes unfold and discuss them in real-time, with the option of alerting their friends via Facebook and Twitter. NGOs and schools from around the world have participated in the two successful pilots so far. This high-performance application is capable of receiving data from numerous data sources, including video and imagery captured by cameras aboard the International Space Station (later in 2014) and streamed through an interactive platform provided by UrtheCast (winner of the T-Systems Cloud Computing Challenge in the 2011 Copernicus Masters competition).



Geodan is also excited to announce that its platform has been exported to South America. The company has partnered with Greenpeace Argentina and re-developed parts of its open-source software, enabling the creation of a new version called “Guardianes”.

DeforestACTION was the winning idea in the Ideas Challenge & Overall Winner 2011.

### Contact

Geodan B.V.  
eduardo.dias@geodan.com  
www.geodan.com

## CERBERUS – CROWDSOURCING AND E-LEARNING PLATFORM

Cerberus is an online game that incorporates very high-resolution satellite imagery and leverages crowdsourcing to analyse big data. It thus enables keen gamers to become volunteers who support scientists by analysing a flood of information and data. The game is being developed by the Dutchman Hans van't Woud, who entered the ESA Business Incubation Center Noordwijk following his success in the Copernicus Masters 2012. After one year of research and development, van't Woud launched his project in November 2013 to help identify areas affected by Typhoon Haiyan in the Philippines. The result was a detailed map completely generated by the Cerberus crowd. With over 8,000 records showing the order of destruction on Bantayan Island, this campaign (which has been covered extensively in the media) has proven the market-readiness and maturity of the Cerberus product.



Thanks to its ability to handle multiple sources of Earth observation data, Cerberus supports mapping in a wide variety of areas. In addition to natural disasters, it will soon be available for monitoring glacial melt in polar regions and other areas of climate change research.

Cerberus was the winning idea in the European Space Imaging High-Res Challenge & Overall Winner 2012.

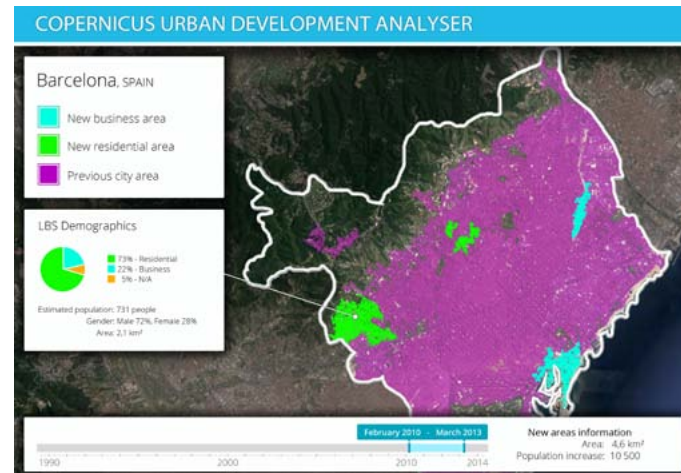
### Contact

BlackShore  
hanswoud@blackshore.eu  
www.blackshore.eu



## COPERNICUS URBAN DEVELOPMENT ANALYSER – CUDA

Since last year, this city development tool has been renamed CUDA – Copernicus Urban Development Analyser. The team has also formed an international consortium with an industry partner, CGI, and associates from Norway, Spain, the UK, and Estonia. This consortium is now working on the further definition of the service and related developments. CUDA is a service that addresses the global megatrend toward urbanisation and the challenges it poses to infrastructures and the environment. To make sound decisions about future developments, accurate and timely information about current situations, past dynamics, and other ongoing trends is essential. CUDA will offer high-resolution information on global urban development based on data from the Sentinel-1 and Sentinel-2 satellites and anonymous, mobile, location-based services (LBS) data. It will be developed in coordination with the Copernicus Land Monitoring service to provide detailed information about urban development. The service will also have an API for public data access and use in other services.



CUDA was the winning idea of the DLR Environmental Challenge 2013.

### Contact

University of Tartu  
kaupo.voormansik@ut.ee  
www.ut.ee

## HAB FORECAST – HARMFUL ALGAL BLOOM FORECAST

Harmful algal blooms (HABs) are natural phenomena that occur sporadically and unpredictably. Interest in HABs has escalated due to concerns associated with human health, adverse effects on biological resources, economic losses attributed to recreation, tourism, and seafood-related industries.

ASIMUTH was developed to issue short-term HAB alert systems for the northeast Atlantic Ocean. This was achieved using information on the most current marine conditions gathered from Earth (in-situ monitoring stations), space (satellite data), and in-silco (biological and physical oceanic models) sources. This integrated, multidisciplinary, trans-boundary approach to the study of HABs has led to a better understanding of the physical, chemical, and ecological factors that influence these blooms, as well as their impact on human activities. Ultimately, this has resulted in an alert system that facilitates effective management of areas at risk of HAB events. Specifically for the aquaculture industry, the information provided continues to enable farmers to adapt their working practices quickly enough to prevent mortalities in finfish farms and/or manage their shellfish harvests more effectively and in a more sustainable manner.



HAB Forecast was the winning idea of the Best Service Challenge 2013.

### Contact

Daithi O'Murchu Marine, Research Station  
julie.maguire@dommrc.com  
www.asimuth.eu



## EOAPP AUSTRALIA

EOMAP was the winner of the Copernicus Masters ESA App Challenge 2011 for Aquamap – a near-real-time water quality service for mobile phones. The Bavarian company has now launched a web app for public use.

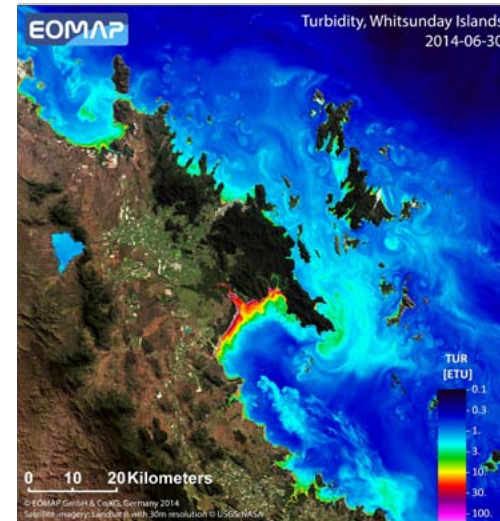
The free app, called eoApp Australia, enables anyone with a web browser to view various water quality parameters in two important areas of Australia: Abbot Point (including an adjoining section of the Great Barrier Reef) and Barrow Island (featuring the nearby Ningaloo Reef). In recent months, EOMAP has paved the way towards the successful implementation of eoApp in order to provide very fast, user-friendly access to its products. The company has succeeded in installing automated water quality processors directly on ground segments in Germany, Central America, and Australia and is currently proceeding on other continents.

Last year, EOMAP's satellite service for mapping global seafloor topography also won the competition's T-Systems Cloud Computing Challenge. The seafloor topography of the Great Barrier Reef has also been included in the new eoApp Australia.

eoApp was the winning idea of the ESA App Challenge 2011.

### Contact

EOMAP GmbH & Co. KG  
info@eomap.de  
www.eomap.com



## BALIST – THE NEARSHORE BATHYMETRY SERVICE FROM SPACE

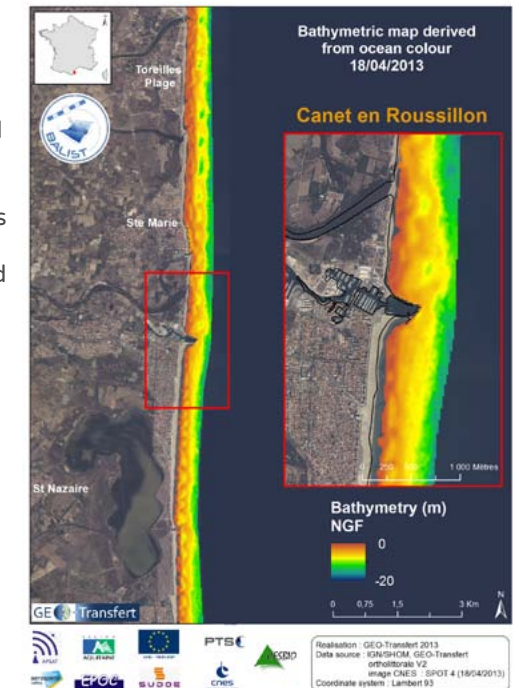
BALIST is a service that maps coastal bathymetry for depths ranging from zero to 20 metres using high resolutions of both optical and radar-based space data. Its development has been funded by the Aquitaine Regional Council (APSAT / INTERREG SUDOE IVb project). The underlying method is based on a combination of an optical-based inversion algorithm and optical or radar-based wave-crest tracking.

The associative structure of the project is currently evolving towards the formation of a private company named i-SEA. The corresponding business model focuses on commercialising EO-based mapping and monitoring solutions, as well as studies and expertise concerning coastal areas and continental waters. BALIST will be part of i-SEA's service portfolio. To obtain expert support in developing the service to market maturity, the start-up company plans to submit a proposal to ESA BIC Sud France. Pending a positive evaluation, it expects to enter the centre's incubation programme before the end of this year.

BALIST was the winning idea of the Astrium Radar Challenge 2012.

### Contact

GEO-Transfert  
v.lafon@epoc.u-bordeaux1.fr  
www.geotransfert.epoc.u-bordeaux1.fr





## THE EXPERTS

### IDEAS CHALLENGE

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

**Dr Stefan Lang**  
University of Salzburg  
Division head | Ass. Prof | Project acquisition & coordination |  
University lecturer

**Dr Stefaan de Mey**  
Eurisy  
Secretary General

**Dr Vanessa Keuck**  
German Aerospace Center (DLR), Space Administration  
Program Manager

**Mikko Strahlendorff**  
Finnish Ministry of Transport & Communications  
Ministerial Adviser

### BEST SERVICE CHALLENGE

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

**Espen Volden**  
GEO – Group on Earth Observation  
GEO Secretariat – Support to the Infrastructure Board

### ESA APP CHALLENGE

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

**Franz Haslbeck**  
m-ACADEMY  
Director

**Pierre-Philippe Mathieu**  
European Space Agency (ESA)  
Earth Observation Applications Engineer

**Dr Robert Meisner**  
European Space Agency (ESA)  
Communication Programme Officer

**Bruno Naulais**  
European Space Agency (ESA)  
European Space Incubators Network Manager

**Thomas Obst**  
Telekom Deutschland GmbH  
Sales Consultant

**Valentijn Venus**  
Ujuizi Laboratories  
CEO

### DLR ENERGY & ENVIRONMENTAL CHALLENGE

**Dr Josef Aschbacher**  
European Space Agency (ESA)  
Head, Programme Planning & Coordination (EOP-C)  
Earth Observation Programmes Directorate

**Dr Rolf-Dieter Fischer**  
German Aerospace Center (DLR)  
Head of Technology Marketing

**Dr Jutta Graf**  
German Aerospace Center (DLR)  
Head Scientific Information

**Dr Stephan Illerhaus**  
Stadtwerke München (swm)  
Director, Portfolio Management and Energy Trading

**Robert Klarner**  
German Aerospace Center (DLR)  
Technology Marketing Oberpfaffenhofen

**Dr Doris Klein**  
German Aerospace Center (DLR)  
Science Advisor, German Remote Sensing Data Center

**Claus Kumutat**  
Bayerisches Landesamt für Umwelt  
President

**Dr Klaus-Dieter Rockwitz**  
German Aerospace Center (DLR)  
DLR Program Directorate Space (PD-R)

**Gunter Schreier**  
German Aerospace Center (DLR)  
Business Development & Copernicus,  
Deputy Director German Remote Sensing Data Center

**Dr Peter Zeil**  
European Commission  
Programme Officer

### T-SYSTEMS BIG DATA CHALLENGE

**Jürgen Janoth**  
Airbus Defence and Space  
Head of SAR Research and  
Development

**Alexander Kaptein**  
Airbus Defence and Space,  
Geo-Intelligence  
Head of Future Programs

**Prof Dr Axel Küpper**  
Deutsche Telekom Laboratories

**Markus Lennartz**  
T-Systems International GmbH  
Vice President Global Accounts  
& International Business

**Sven Löffler**  
T-Systems International GmbH  
Business Development Executive

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

**Gerald von Nieding**  
T-Systems International GmbH  
SAP Relation Center/Partnerport  
Walldorf

**Bernhard Ruff**  
T-Systems International GmbH  
Head of Support & Geo-Services

**Dr Bernd Schirpke**  
T-Systems International GmbH  
ICT Transformation Consulting

**Sascha Steiner**  
T-Systems International GmbH  
Innovation Center

**Roland Voelskow**  
T-Systems International GmbH  
Portfolio Executive IT-Hosting

**Ralf Willenbrock**  
T-Systems International GmbH  
Business Development Manager

**Christian Wirth**  
T-Systems International GmbH  
Vice President Business  
Intelligence & Big Data

**Natascha Zierow**  
T-Systems International GmbH  
Marketing



## THE EUROPEAN SPACE IMAGING & SKYBOX IMAGING HIGH-RES CHALLENGE

**Dr Wolfgang Baetz**  
European Space Imaging GmbH  
Senior Advisor

**Dr Michael Bock**  
German Aerospace Centre, Space Administration  
Project Officer EO Applications

**Prof Dr Gerd Buziek**  
Esri Deutschland Group GmbH  
Director Communications & Public Affairs

**Dr Markus Lautner**  
GAF AG  
Unit Head Image Processing

**Michaela Neumann**  
European Space Imaging GmbH  
Director Sales & Marketing

**Bob Noack**  
Five Continents International (5CI)  
Executive Vice President

**Dr Lena Stern**  
European Space Agency (ESA)  
Mission Management Officer

**Adrian Zevenbergen**  
European Space Imaging GmbH  
Managing Director

## CLOUDEO FARMING CHALLENGE

**Dr Manfred Krischke**  
CloudEO AG  
CEO

**Prof Dr Patrick Noack**  
Hochschule Weihenstephan-Triesdorf |  
University of Applied Sciences  
Professor

**Prof Dr Peter Reinartz**  
German Aerospace Center (DLR)  
Remote Sensing Technology Institute Photogrammetry  
and Image Analysis  
Head of Department

**Stefan Scherer**  
CloudEO AG  
System Architect

## RADAR CONSTELLATION CHALLENGE BY AIRBUS DEFENCE AND SPACE & HISDESAT

**Derrold Holcomb**  
Hexagon Geospatial  
Product Owner Advanced Imaging

**Jürgen Janoth**  
Airbus Defence and Space  
Head of SAR Research and Development

**Dr Wolfgang Koppe**  
Airbus Defence and Space  
Applications Development Manager

**Dr Oliver Lang**  
Airbus Defence and Space  
Head of SAR Monitoring Services

**Miguel Angel García Primo**  
Hisdesat Servicios Estratégicos, S.A.  
Chief Operating Officer

**Dr Bernd Scheuchl**  
University of Irvine, California  
Associate Project Scientist

**Dr Karsten Schulz**  
Fraunhofer IOSB  
Head of Department Scene Analysis

## TRANSPORT AND LOGISTICS CHALLENGE BY SATELLITE APPLICATIONS CATAPULT

**Andrew German**  
Technology Strategy Board  
Lead Technologist Satellite Applications

**Stephen Hart**  
Technology Strategy Board  
Innovation Platform Leader Transport Systems

**Dr Richard Hilton**  
Satellite Applications Catapult  
Head of Earth Observation

**Stuart Martin**  
Satellite Applications Catapult  
CEO and Executive Director

**Steve Spittle**  
Satellite Applications Catapult  
Earth Observation Specialist



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Anwendungszentrum GmbH Oberpfaffenhofen  
Friedrichshafener Str. 1  
82205 Gilching, Germany

Ms Lara Schaflinger  
Email: [team@copernicus-masters.com](mailto:team@copernicus-masters.com)  
Website: [www.copernicus-masters.com](http://www.copernicus-masters.com)

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