

EARSel



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NEWSLETTER



European Association of Remote Sensing Laboratories

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Editorial

Dear members,

This June Issue starts with the forthcoming EARSeL event, the “White Sea Student Workshop on Optics of Coastal Waters” that will take place in Primorskiy, Republic Karelia, Russia, on 30 August – 07 September 2014, organised by the EARSeL’s SIG Education and Training.

A report on the International Remote Sensing Summer School - SplitRS 2014 that was held in Croatia on 21-23 May 2014 at the Mediterranean Institute for Life Science, has been included at the “News from Other Organisations” section.

At the “Science Article” rubric, Wim Baker reports on the recent developments in Earth Observation satellites and sensors.

Two new research papers have been published in the EARSeL eProceedings entitled “Satellite remote sensing applied to off-shore wind energy” and “An application of the Perpendicular Moisture Index for the prediction of fire hazard”. Book releases include the 2nd edition of the “An Introduction to Ocean Remote Sensing” and “Forestry Applications of Airborne Laser Scanning: Concepts and Case Studies (Managing Forest Ecosystems)”.

Last but not least, a list of conferences, training courses and summer schools to attend in the near future can be found in the last part of the Newsletter.

The next September issue will provide you an extensive report on the 34th EARSeL Symposium in Warsaw, Poland, June 16-20, 2014.

We will be pleased to receive your feedback. Moreover, you are more than welcome to contribute a science article or report for the forthcoming issues of the EARSeL Newsletter.

Enjoy reading the June issue!

The Editors

News from EARSeL

White Sea Student Workshop on Optics of Coastal Waters

30 August – 07 September 2014, Primorskiy, Republic Karelia, Russia

[More info](#)



Info

More than 60% of humans live within 60 km from the coastline. Therefore coastal zones, including inland waters and land-ocean interfaces, are important environmental and economic resources, and their investigation with boats or ships has always been a challenge. Today hydrographic data are often collected from space or using airborne sensors, which is particularly relevant in regions with complex coastal waters influenced by freshwater and characterised by long coastlines. A particularly sensitive region is the Karelian coast of the White Sea, which is an inlet of the Barents Sea and one of the seas of the Arctic Ocean.

Optical methods in environmental science have reached a high precision in various marine and land surface applications: vegetation and phytoplankton diagnostics, quantification of suspended and dissolved matter in waters, composition of soils, and pollution analysis, to name but a few. Sunlight reflectance and thermal emission measurements make it possible to investigate parameters such as the penetration depth of light, the phytoplankton and coloured dissolved organic matter content in the ocean, land cover vegetation, and temperature of the Earth surface. Airborne remote sensing using lasers provides a tool for detecting pollutants such as oil spills at sea and discharges on land.

The White Sea Student Workshop on Optics of Coastal Waters jointly organised by the Lomonosov Moscow State University and the European Association of Remote Sensing Laboratories (EARSeL) to be held at the Nikolai Pertsov White Sea Biological Station, Primorskiy, Republic Karelia, Russia, will be a 5-day education and training event. It will address the principles, methods and results of optical analysis of environmental parameters using modern instruments in tutorials and field excursions. Findings will be evaluated in the context of hydrographic processes and ecosystem variables. The relevance of oceans and coastal zones for the daily weather and for the regional and global climate will be outlined.

The Workshop is intended for master and PhD students dealing with biological and physical oceanography and environmental sciences. It will offer students the opportunity to meet international researchers and to gain first-hand experience in marine optics and optical remote sensing in plenary sessions, individual study groups, and experiments in the laboratory and in the field. Students will have the opportunity to demonstrate their projects in oral or poster presentations.

The number of students at the Workshop will be limited to 10. An interactive poster presentation will be offered to other interested students through an internet-based participation.

Topics

The Workshop will be a 5-day training event for master and PhD students interested in environmental research. The programme consists of:

- Plenary lectures presented by international researchers on the current use of optical sensing for environmental research and monitoring
- Individual study groups for an in-depth evaluation of selected methods of optical analysis, followed by presentations in plenary sessions
- Practical exercises in the laboratories of the Biological Station
- In situ measurements in freshwater lakes and in the Kandalaksha Bay of the White Sea
- Plenary presentation and discussion of results obtained in the practical programmes
- Presentation of student projects, e.g. master and PhD theses, in oral presentations and with posters



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Head of Nikolai Pertsov White Sea Biological Station

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For more detailed information please visit the Workshop website at:

<http://www.earsel.org/SIG/ET/1st-student-workshop/index.php>

News from Other Organisations

SplitRS 2014 - International Remote Sensing Summer School “Remote Sensing Data and Information”

Croatia, 21-23 May 2014

The International Remote Sensing Summer School SplitRS 2014 was held in Split, Croatia on 21-23 May 2014 at the Mediterranean Institute for Life Science (<http://splitremotesensing.com>).

SplitRS 2014 was successfully organized by G-ECO Research (Toronto, Canada) and EARSeL, together with Bowling Green State University (Ohio, USA) and GEOSAT (Zagreb, Croatia).

The program theme was: Remote Sensing and Information

Summer School Director: Dr. Anita Simic Milas (G-ECO Research)

Program Chair: Dr. Marinko Oluic (GEOSAT)

Technical Chair: Dr. Nicolas Younan (Mississippi State University)

The objectives of **SplitRS 2014** were to:

- Promote the state-of-the-art Remote Sensing Technology among young professionals
- Strengthen professional networking

The lecturers at **SplitRS 2014** were:

- Dr. Lena Halounova, Czech Technical University (Czech Republic)
- Dr. Martin Isenburg, Rapidlasso (Germany)
- Dr. Roger L. King, Mississippi State University (USA)
- Dr. Claudia Notarnicola, EURAC-Institute of Applied Remote Sensing (Italy)
- Dr. Marinko Oluic, University of Zagreb/GEOSAT (Croatia)
- Dr. Susan L. Ustin, University of California (USA)

The participants were students and professionals from: Estonia, Germany, Netherlands, Romania, UK and Croatia (Figure 1).



Figure 1. The participants of the Split Remote Sensing Summer School – SplitRS 2014 (with the exception of Dr. Lena Halounova and Dr. Claudia Notarnicola who joined the event after the picture was taken).

SplitRS 2014 was intended for PhD students and professionals dealing with remote sensing applications in geoscience. The program included a hands-on workshop on LiDAR and lectures on various remote sensing topics with the emphasis on optical sensors.

The school offered the opportunity for participants to meet top international professors and researchers in the field of remote sensing and to gain an in-depth and hands-on education on selected topics.

SplitRS 2014 was unique for its open professional discussions between the participants and lecturers in a productive and comfortable atmosphere. The class was manageable in size and every participant had the opportunity to ask questions and build his/her knowledge. Students had the opportunity to bring and display their posters during the student-poster session and to discuss their work with the instructors and peers. A pleasant atmosphere during the Social Event enhanced socializing among the participants and enriched their professional networking. Each participant received a certificate confirming his/her attendance to **SplitRS 2014** with the logos of G-ECO Research and EARSel.

The participants' comments about **SplitRS 2014** included compliments about the high level lectures and discussions, very well selected lectures, well organized schedule, very interesting topics, flexible time management to allow for discussion, and productivity. A number of participants expressed their interest for the same event to be organized next year, **SplitRS 2015** in Split. They also expressed their astounding opinion about the venue, Social Event and hospitality during the event.

G-ECO Research and EARSel would like to acknowledge the financial support to students received from the Croatian Academy of Sciences and Art (Croatia), Spectral Evolution (USA), and Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split (Croatia).

Prof. Marinko Oluic
geo-sat@zg.t-com.hr

Science Article

Satellites & Sensors

This article reports on recent developments in Earth-observing satellites and sensors.

PhoneSat 2.5

PhoneSat 2.5 was launched 3 March onboard of the SpaceX spacecraft. NASA's phoneSats are cubesats that measure approximately 10 centimeters on each side. They are built using commercially available smartphones. PhoneSat 2.5 is already the fifth satellite in the series. It's an improved version of the previous PhoneSats and is used to test the attitude control, and to investigate whether it's able to survive the hard radiation in space. The expected lifetime of PhoneSat 2.5 is about six weeks. The camera of the smartphone will be used to transmit images to the ground station. In the future such images may be used as low-cost star trackers. The PhoneSat demonstration mission paves the way for a constellation of cooperative small satellites scheduled to be launched later this year.

DMSP-F19

The most recent launch of a DMSP polar-orbiter weather satellite, DMSP-F19, occurred on 3 April. The craft carries a suite of weather instruments to observe the entire planet twice daily. This is the 53rd DMSP satellite produced. According to reports, the DMSP satellite's solar array did not completely deploy, but the satellite is expected to enter service nonetheless. Whether the last satellite in the series, DMSP-F20, will be launched at all is not clear yet. It may be decided to keep it there in favour of moving on to the next-generation of a smaller spacecraft.

Planet Labs

Planet Labs has announced that, over the next 12 months, it will launch more than 100 satellites using rockets from the USA and Russia. This will be the largest constellation of satellites ever launched in history. These new series B satellites will build on Planet Labs experience with their first 28 satellites, called Flock 1, which were launched in January. The whole constellation will allow Planet Labs to image the entire earth every 24 hours. According to Planet Labs they "are imaging the planet to save the planet."

Sentinel-1A

The first satellite in the European Commission's Sentinel/Copernicus Earth observing program was launched on 3 April. Sentinel-1A's C-band SAR is 13.3 by 0.8 meter in size. The satellite has a mass of 2.2 tonne, which is only a quarter the mass of its predecessor Envisat which carried a much larger number of instruments. In the Sentinel program there will be a series of smaller, more specialized satellites. Already on its second day in orbit Sentinel had made a manoeuvre to avoid a very close encounter with NASA's defunct ACRIMSAT satellite, which failed on 14 December after its 14-year record of measuring solar output. Debris avoidance burns are becoming more and more commonplace with the increase of space debris. But doing a manoeuvre during spacecraft checkout in the first days after launch is not normal and required a major replanning effort by ESA's flight operations department. The Sentinel-1 mission comprises two identical satellites and Sentinel-1B will join Sentinel-1A in orbit next year.

Ofek-10

Israel launched their Ofek-10 (Horizon-10) spy satellite on 9 April. According to reports it carries a radar imaging (SAR) payload. In contrast to most other launches, either to polar orbit or eastward, to take advantage of Earth's rotation direction, Israel launches westward over the Mediterranean to a retrograde orbit, accepting a payload mass penalty as a result. The reason for this is that an eastward launch from Israel might be misinterpreted by its neighbours. Ofek-10 is the latest in a series of spy satellites Israel has been deploying since 1988, with the most recent, Ofek-9, launched in 2010.

EgyptSat-2

EgyptSat-2 was launched from Baikonur cosmodrome on 16 April. The satellite weighs about one tonne and has an expected lifetime of 11 years. The sensor has a resolution of 1 meter in panchromatic mode and 4 meter in multispectral mode. In 2007 the Ukrainian-made EgyptSat-1 was launched. But this satellite failed prematurely after 3 years of service.

DZZ-HR/KazEOSat-1

The third launch of Europe's Vega light launch vehicle successfully placed the Kazakh DZZ-HR imaging satellite in orbit on 30 April. DZZ-HR was renamed KazEOSat-1 after launch. The satellite was built by Airbus Defense and Space, is based on the Astrosat bus and has an imager with 1 meter resolution. Expected lifetime of the satellite is 7 years. The satellite, originally known as KazEOSat-2, was renamed shortly before its launch to reflect the order in which the two KazEOSat satellites are being launched, since the Medium Resolution (6.5 meter) satellite is set for liftoff in June.

Kosmos-2495

Russia launched the spy satellite Kosmos-2495 on 6 May. Public information shows that it is the newest Cobalt-M film-return spy satellite to fly, returning after a two-year absence. The 6.7 tonne satellite has a lifetime in orbit of up to 6 months and probably has a resolution of about 30 centimeters. After the film is used up, the film return module would separate and return to Earth. However, the era of film-returning spy satellites in Russia (and around the world) may be coming to an end, as public information shows that only one more Cobalt-M is planned to fly after this one. Of course, the new generation spy satellites will be using digital methods to beam down photographs. In fact, it is surprising that such satellites are still flying more than 50 years after the first film-return satellites. As technology improved, electro-optical sensors became more practical, and, thanks to the ability to return images for analysis almost immediately, these are also more desirable.

CBERS-4

The Brazilian Space Agency (AEB) confirmed that the launch of the CBERS-4 satellite is expected to take place in December. CBERS-4 was originally scheduled to be launched in 2015, but the date was brought forward following the failed launch of the CBERS-3 satellite last December. China and Brazil continue their cooperation building CBERS-5, which is expected to be launched somewhere in 2017.

Launch schedule

Satellite	Launch date
ALOS 2	23/24 May
Spot 7	2nd quarter 2014

Meteor M2	19 June
Deimos 2, KazEOSat 2, SkySat 3	19 June
OCO 2	1 July
Gaofen 2	July
WorldView 3	13 August
Asnaro-1	August
Himawari 8	September
SMAP	5 November
Amazônia-1	December
CBERS-4	December

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EARSeL eProceedings

New Publications in Vol. 13(1), 2014



Satellite remote sensing applied to off-shore wind energy

Sara Venafra, Marco Morelli, and Andrea Masini

Abstract

Read full paper online: <http://www.eproceedings.org>

Wind as an energy resource has been increasingly in the focus of attention over the past decades, starting with the global oil crisis in the 1970s. The possibility of expanding wind power production to off-shore locations is attractive, especially in sites where wind levels tend to be higher and more constant.

Wind turbine energy production is usually evaluated by means of a wind turbine power curve, which is provided by the manufacturer and it is an important parameter to estimate wind plant performances. In this study we present a methodology aimed to support both planning of offshore wind farms using historical series of satellite data in order to detect the sites which could provide more wind energy production than others, and near real-time monitoring of offshore wind energy performances by means of SAR data. SAR wind data are retrieved from measured radar backscatter using empirical geophysical model functions, achieving good accuracy, global coverage and greater spatial resolution with respect to other wind measurement methods.

Moreover, we are able to calculate the AC power yield expected behaviour, using detailed models of each part of the wind plants.

In brief, we use SAR data from Cosmo-SkyMed in X-Band and from ERS and ENVISAT in C-Band to generate instant wind speeds and a composite product from NCDC NOAA to investigate wind climatology.

Such methodologies are currently being developed within the scope of SATENERG, a research project funded by ASI (Italian Space Agency). These methods have been applied in several test cases, and successful results in comparison with standard methodologies were obtained.

An application of the Perpendicular Moisture Index for the prediction of fire hazard

Carmine Maffei, and Massimo Menenti

Abstract

Read full paper online: <http://www.eproceedings.org>

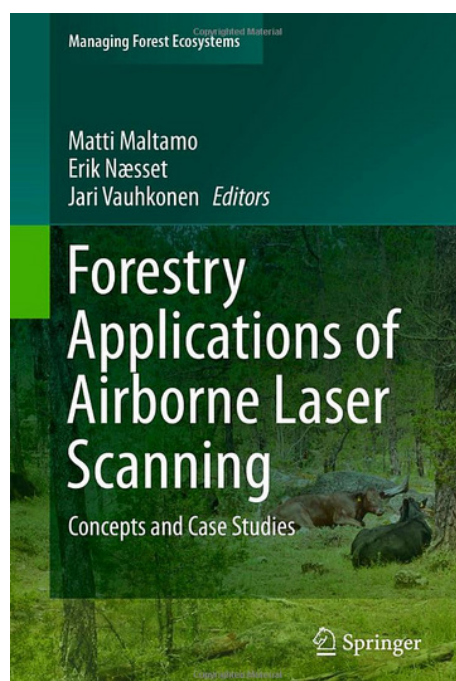
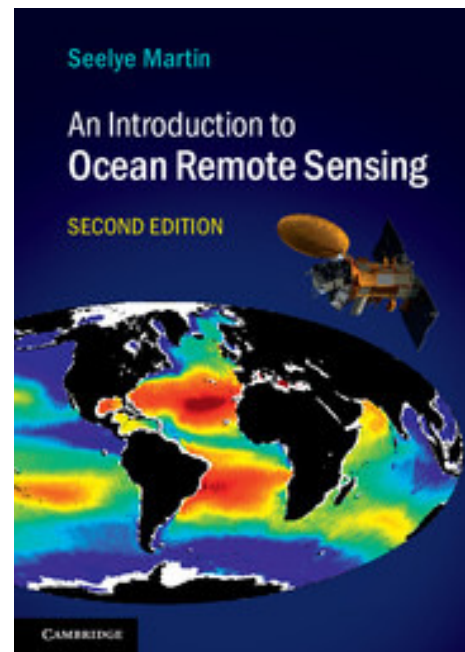
Various factors contribute to forest fire hazard, and among them vegetation moisture is the one that dictates susceptibility to fire ignition and propagation. The scientific community has developed a number of spectral indices based on remote sensing measurements in the optical domain for the assessment of vegetation equivalent water thickness (EWT), which is defined as the mass of liquid water per unit of leaf surface. However, fire models rely on the live fuel moisture content (LFMC) as a measure of vegetation moisture. LFMC is defined as the ratio of the mass of the liquid water in a fresh leaf over the mass of oven dry leaf, and spectral indices proposed so far fail in capturing LFMC variability. Recently, the perpendicular moisture index (PMI), based on MODIS, was proposed to overcome this limitation and provide a direct measure of LFMC. The aim of this research was to understand the potential and limitations of the PMI in predicting fire hazard, towards its application in a practical context.

To this purpose, a data set of more than 7,700 fires recorded in Campania (13,595 km²), Italy, between 2000 and 2008 was compared with PMI derived from MODIS images. Results show that there is no relationship between PMI and fire size, whereas a linear correlation was found between the spectral index and fire rate of spread.

Book Releases

An Introduction to Ocean Remote Sensing (2nd Edition) written by Seelye Martin was published by Cambridge University Press.

Fully updated, with significant new coverage of advances in satellite oceanography and results from new satellite missions, the second edition of this popular textbook introduces students to how remote sensing works, how to understand observations from Earth-observing systems, and the observations' importance to physical and biological oceanography. It provides full explanations of radiative transfer, ocean surface properties, satellite orbits, instruments and methods, visible remote sensing of biogeochemical properties, infrared and microwave retrieval of sea surface temperature, sea surface salinity retrieval, passive microwave measurements, scatterometer wind retrieval, altimetry and SAR. Also included are descriptions of the online archives where data can be obtained, and readers can obtain online tools for working with the data - enabling hands-on engagement with real-world observations. This is an ideal textbook for graduate and advanced undergraduate students in oceanography, remote sensing and environmental science, and a practical resource for researchers and professionals working with oceanographic satellite data.



Forestry Applications of Airborne Laser Scanning: Concepts and Case Studies (Managing Forest Ecosystems) written by Matti Maltamo, Erik Næsset and Jari Vauhkonen is available from Springer.

This book provides a comprehensive and state-of-the-art review of the research and application of airborne laser scanning (ALS) in a broad range of forest-related disciplines. However, this book is more than just a collection of individual contributions – it consists of a well-composed blend of chapters dealing with fundamental methodological issues and contributions reviewing and illustrating the use of ALS within various domains of application.

The main aim of this book is to provide the scientific and technical background of ALS with a particular focus on applicability in operational forestry. Most of the chapters are devoted to applications in forest inventory and forest ecology such as forest management inventory and assessments of canopy cover, habitats and organism-habitat relationships. Many of the chapters focus on boreal forests

simply because methods were initially developed for boreal conditions. However, examples show the most common applications of ALS at various geographical scales; from individual trees, to forest stands, regions and nations. The reviews provide a comprehensive and unique overview of recent research and applications that researchers, students and practitioners of forest remote sensing and forest ecosystem assessment should consider as a useful reference text.

Forthcoming EARSeL Conferences

34th EARSeL Symposium 2014 & Workshops

European remote sensing - new opportunities for science and practice

16 – 20 June 2014, Warsaw, Poland

[More info](#)



The 34th EARSeL Symposium entitled “European remote sensing - new opportunities for science and practice” will be held in Warsaw, Poland from 16th to 20th June 2014.

It will be accompanied by the following events:

- Joint Workshop of EARSeL Special Interest Groups 3D Remote Sensing and Urban Remote Sensing, Warsaw, 19-20 June 2014
- 5th Workshop of SIG Geological Applications, Warsaw, 19-20 June 2014
- 2nd Workshop of EARSeL Special Interest Group on Forestry Remote Sensing for Forestry Applications - New Challenges, Approaches and Achievements, Warsaw, 17-18 June 2014
- EARSeL & ISPRS Young Scientist Days

For more detailed information please refer to the Symposium website at:

<http://www.earsel.org/symposia/2014-symposium-Warsaw> which also provides links to the accompanying events.

White Sea Student Workshop on Optics of Coastal Waters

30 August – 07 September 2014, Primorskiy, Republic Karelia, Russia

[More info](#)



Call for papers

The White Sea Student Workshop on Optics of Coastal Waters jointly organised by the Lomonosov [Moscow State University](#) and the [European Association of Remote Sensing Laboratories \(EARSel\)](#) to be held at the [Nikolai Pertsov White Sea Biological Station](#), Primorskiy, Republic Karelia, Russia, will be a 5-day education and training event. It will address the principles, methods and results of optical analysis of environmental parameters using modern instruments in tutorials and field excursions. Findings will be evaluated in the context of hydrographic processes and ecosystem variables. The relevance of oceans and coastal zones for the daily weather and for the regional and global climate will be outlined.

The Workshop is intended for master and PhD students dealing with biological and physical oceanography and environmental sciences. It will offer students the opportunity to meet international researchers and to gain first-hand experience in marine optics and optical remote sensing in plenary sessions, individual study groups, and experiments in the laboratory and in the field. Students will have the opportunity to demonstrate their projects in oral or poster presentations.

The number of students at the Workshop will be limited to 10. An interactive poster presentation will be offered to other interested students through an internet-based participation.

For more detailed information please visit the Workshop website at:

<http://www.earsel.org/SIG/ET/1st-student-workshop/index.php>

Other Conferences



2-4 June, 2014: [Global Space Applications Conference \(GLAC\)](#).
Paris, France.



3 June, 2014: [Earth observation breakthroughs \(seminar\)](#).
Brussels, Belgium.



3-5 June, 2014: [EuSAR 2014: 10th European Conference on Synthetic Aperture Radar](#).
Berlin, Germany.



3-6 June, 2014: [17th AGILE Conference on Geographic Information Science: Connecting a Digital Europe through Location and Place](#).
Castellon, Spain.



10-13 June, 2014: [Open Source Geospatial Research and Education Symposium \(OGRS 2014\)](#).
Espoo (Greater Helsinki area), Finland.



11-14 June, 2014: [Third International Workshop on Earth Observation and Remote Sensing Applications \(EORSA 2014\)](#).
Changsha, China.



18-20 June, 2014: [CBMI 2014, The 12th International Content Based Multimedia Indexing Workshop](#).
Klagenfurt, Austria.



23- 25 June, 2014: [ISPRS Technical Commission V Symposium](#).
Riva del Garda, Italy.



24-27 June, 2014: [6th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing \(WHISPERS 2014\)](#).
Lausanne, Switzerland.



1-3 July, 2014: [AfricaGEO 2014 Conference & Exhibition](#).
Cape Town, South Africa.



1-4 July, 2014: [GI_Forum 2014: Geospatial Innovation for Society](#).
Salzburg, Austria.



11-13 July, 2014: [3rd International Conference on Signal and Image Processing \(CSIP 2014\)](#).
Beijing, China.



13-18 July, 2014: [IGARSS 2014 and 35th Canadian Symposium on Remote Sensing](#).
Québec, Canada.



13-16 July, 2014: [Second International Conference on Vulnerability and Risk Analysis and Management \(ICVRAM2014\) & Sixth International Symposium on Uncertainty Modelling and Analysis \(ISUMA2014\)](#).
Liverpool, United Kingdom.



2-10 August, 2014: [40th COSPAR Scientific Assembly](#).
Moscow, Russian Federation.



11-14 August, 2014: [Agro-Geoinformatics 2014: The Third International Conference on Agro-Geoinformatics](#).
Beijing, China.



25-28 August, 2014: [PIERS 2014 Progress in Electromagnetics Research Symposium](#).
Guangzhou (Canton), China.



18-23 August, 2014: [12th AsiaFlux International Workshop](#).
Laguna, Philippines.



2-5 September, 2014: [Remote Sensing and Photogrammetry Society Conference 2014](#).
Aberystwyth, United Kingdom.



3-5 September, 2014: [CompIMAGE'14, Computational Modeling of Objects Presented in Images: Fundamentals, Methods, and Applications](#).
Pittsburgh, Pennsylvania, USA.



5-7 September, 2014: [Photogrammetric Computer Vision - PCV 2014, ISPRS Technical Commission III Symposium](#).
Zurich, Switzerland.



8-11 September, 2014: [1st International Geomatics Applications GEOMAPPLICA Conference](#).
Skiathos Island, Greece.



13-16 September, 2014: [ISCGM 2014, International Symposium on Crop Growth Monitoring](#).
Nanjing, China.



17-19 September, 2014: [EarthCARE Workshop 2014](#).
Tokyo, Japan.



22-25 September, 2014: [SPIE Remote Sensing 2014](#).
Amsterdam, Netherlands.



22-26 September, 2014: [RAQRS'IV: the 4th International Symposium on Recent Advances in Quantitative Remote Sensing](#).
Valencia, Spain.



23-26 September, 2014: [GIScience 2014. Eighth International Conference on Geographic Information Science](#).
Vienna, Austria.



6-8 October, 2014: [Joint International Conference on Geospatial Theory, Processing, Modelling and Applications](#).
Toronto, Canada.



7-11 October, 2014: [GéoCongrès 2014 / GeoConference 2014](#).
Quebec, Canada.



13-17 October, 2014: [Climate Research and Earth Observations from Space: Climate Information for Decision Making](#).
Darmstadt, Germany.



13-17 October, 2014: [International Radar Conference 2014, Catching the invisible \(RADAR 2014\)](#).
Lille, France.



13-17 October, 2014: [SPIE Asia-Pacific Remote Sensing 2014](#).
Beijing, China.



20-23 October, 2014: [14th International Scientific and Technical Conference](#).
Hainan, China.



23-24 October, 2014: [8th Coastal Altimetry Workshop](#).
Konstanz, Germany.



27-30 October, 2014: [IEEE International Conference on Image Processing](#).
Paris, France.



27-31 October, 2014: [The 35th Asian Conference on Remote Sensing. Sensing for Reintegration of Societies](#).
Nay Pyi Taw, Myanmar.

-  28-31 October, 2014: [Earth Observation for Ocean-Atmosphere Interactions Science](#).
Frascati, Italy.
-  3-5 November, 2014: [Workshop of Photogrammetry, Remote Sensing and Laser Scanning](#).
Telč, Czech Republic.
-  3-5 November, 2014: [Geomatics Atlantic 2014](#).
St. John's, Newfoundland, Canada.
-  9-11 November, 2014: [5th Digital Earth Summit 2014 Earth](#).
Nagoya, Japan.
-  13-14 November, 2014: [SMOS Workshop, Understanding the Carbon and Water Cycles using SMOS Data and Models](#).
Toulouse, France.
-  25-27 November, 2014: [Pacific Islands GIS&RS User Conference](#).
Suva, Fiji Islands.
-  25-28 November, 2014: [5th International GOCE User Workshop](#).
Paris, France.
-  26-27 November, 2014: [MoLaS: Mobile Laser Scanning Technology Workshop](#).
Freiburg, Germany.
-  26-28 November, 2014: [Ocean Salinity Science & Salinity Remote Sensing Workshop](#).
Exeter, United Kingdom.
-  2-3 December, 2014: [LowCost3D, Sensors, Algorithms, Applications](#).
Berlin, Germany.
-  08-10 December, 2014: [SPAR Europe & European LiDAR Mapping Forum](#).
Amsterdam, Netherlands.

Summer Schools and Advanced Courses



PhD Summer School Remote Sensing for Wind Energy

10-13 June 2014, Technical University of Denmark, Roskilde, Denmark

Deadline for registration: **21 May 2014**



Ocean Remote Sensing Synergy summer school

30 June - 4 July 2014, Telecom Bretagne, Plouzané, France

Deadline for registration: **30 May 2014**



White Sea Student Workshop on Optics of Coastal Waters

30 August - 7 September 2014, Lomonosov Moscow State University, European Association of Remote Sensing Laboratories (EARSeL), Nikolai Pertsov White Sea Biological Station, Northern Russia

Registration deadline: **31 May 2014**



Summer School on Remote Sensing of Clouds and Precipitation: Observation and Processes

8-17 September 2014, Hans Ertel Centre of Weather Research (HErZ), Bonn, Germany

Deadline for registration: **31 May 2014**



2nd SMOS TRAINING COURSE

18-22 May 2015, CESBIO, ESA-ESAC (near Madrid), Spain

Registration deadline will be announced.

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