

→ **ADVANCED ATMOSPHERIC TRAINING COURSE 2014**

SEOM/ATC14

Yves-Louis DESNOS, Claus ZEHNER

27–31 October 2014 | Forschungszentrum Jülich | Germany

SEOM objectives:

- Federate, support and expand the research community
- Strengthen the leadership of European EO research community
- Enable the science community to address new scientific research

Please visit SEOM.ESA.INT



The screenshot shows the SEOM website with the following content:

- Header:** seom scientific exploitation of operational missions, ESA logo.
- Navigation:** ESA, SEOM, OBJECTIVES, ACTION LINES, CONFERENCES, NEWS, TOOLBOX, TRAININGS.
- Left Sidebar:**
 - ESA EO
 - GMES
 - SENTINEL
 - NEW OPPORTUNITIES
 - Invitations to Tender
 - PARTNERS
 - PROJECTS
 - CONTACTS
- Main Content:**
 - SEOM > Home
 - living planet symposium 2013** (EDINBURGH 09-13 September)
 - The SEOM (Scientific Exploitation of Operational Missions) element:**

The prime objective of the SEOM element of the Earth Observation Envelope Program 4 is to federate, support and expand the large International research community that the ERS, ENVISAT and the Envelope programmes have build up over the last 20 years. It aims to further strengthen the international leadership of European Earth Observation research community by enabling them to extensively exploit observations from future European operational EO missions. SEOM will enable the science community to address many new avenues of scientific research that will be opened by free and open access to data from operational EO missions.
- Right Sidebar:**
 - seom** scientific exploitation of operational missions
 - Fringe 2015**
 - POLINSAR 2015 & 1st BIOMASS Science Workshop**
 - Polarimetry Course 2015**
 - 5th Advanced Training Course on Land Remote Sensing 2014**
 - 7th ESA EO Summer School**

Science Users Consultations

Organising a series of regular international **thematic workshops** for science users consultation and gathering users feedback

Scientific Toolboxes Development

Developing, validating and maintaining open-source, multi-mission, **scientific software toolboxes**

Research & Development Studies

Launching state-of-the-art **R&D studies** for scientific exploitation of operational missions

Training Next Generation of EO Scientists

Offering a multi-year programme of advanced international **training courses**, summer schools and educational materials

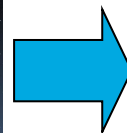
Promoting Science Data Use and Results

Promoting scientific use of data and ensuring regular, timely, high-quality **scientific publications**

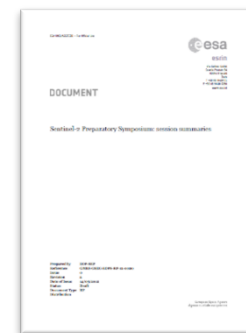
International science **user consultations** are organized regularly



Reporting at next WS



Science User recommendations are gathered

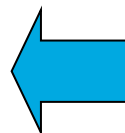


SEOM work plan approved at **PB-EO**



ITTs & Contracts are being placed

R&D-New Methods
Scientific Toolboxes
Trainings
Workshops Results

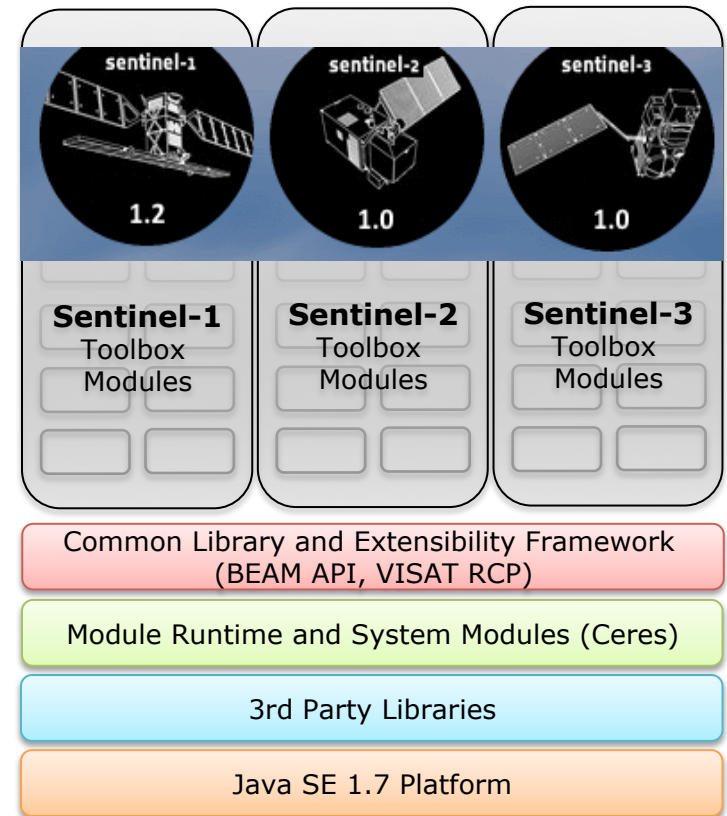


Title	Subjet/ Status	Cost (K€)	Team
S1-ToolBox	Multi-mission SAR TBX Kick-off Feb 2014 1st Release Sep 2014	530	ARRAY (CAN) DLR (D), Brockmann Consult (D) OceanDataLab (F)
S2-ToolBox	Multi-mission high-resolution multi-spectral TBX Kick-off Jan 2014 1st Release Sep 2014	550	CS Systemes d'Information (F) CS (RO) , Brockmann Consult (D) Telespazio Vega Germany (D), INRA (F), UCL (B)
S3-ToolBox	Multi-mission multi-spectral TBX Kick-off Feb 2014 1st Release Sep 2014	530	Brockmann Consult (D) CS (F), ACRI (F), Array (CAN), Univ. Reading (UK)
S5P-ToolBox	Atmospheric TBX for the S-5P Mission 1st Release Nov 2014	250	S&T (NL)
S3-ALT – Toolbox	Scientific exploitation of SAR altimetry ITT issued Q3 2014	300	TBD
Total		2.16 M€	

of operational missions

Sentinel1/2/3 Toolboxes

- Scientific Toolboxes facilitating the exploitation of Sentinel 1/2/3 data
- Developed as open source software
- The S1/S2/S3 toolboxes share a common architecture and are multi-missions
- Support ERS/ENVISAT and 3rd Party SAR & VIS/ NIR/TIR imaging sensors
- Based on evolution of the ENVISAT toolboxes (BEAM/NEST)
- Sentinel toolboxes are specified to be portable to a Cloud infrastructure
- Three toolboxes developed in coordination by ESA with regular developer forums
- S1/2/3 Toolboxes first release 29 September 2014



S1TBX: Array Systems Computing (CAN)
S2TBX: CS sytemes d'information (F)
S3TBX: Brockmann Consult (D)

BASIC **ENVISAT** ATMOSPHERIC TOOLBOX

WWW.STCORP.NL/BEAT
PRACTICAL THIS AFTERNOON

Title	Subject	Cost (K€)	Team
S1-INSARAP	SENTINEL-1 INSAR Performance study using TOPS data	250	DLR (D) ; GFZ (D) GEOS (I), INGV (I)
	Two contracts kicked off in Mar 2014	250	NORUT (NO) ; University of Leeds (UK), PPO Labs (NL), Polish Geological Institute (PO), Geological Survey of Norway (NO)
S5P ISAS	Improved Atmospheric Spectroscopy Data-Bases (IAS) for S5-P Kick-off Jan 2014 1 st PM June , Paris	530	DLR (D) , Karlsruhe Institute of Technology (D),URCA - Université de Reims (F),LIPhy - Laboratoire interdisciplinaire de Physique (F), SERCO (I)
S3-CAWA	Advanced C louds, A erosols and W ater vapour products for Sentinel-3/OLCI Kick-off in July 2014, Berlin	350	SpectralEarth (D) , Brockmann Consult (D),Université de Lille (F), Catalysts (A)
EDUCEO	Pilot Projects Education for EO using Citizen science approach Kick-off in June and May 2014 respectively	150	Geodan Holding b.v. (NL) ,IIASA (A), Terranea UG (D), Sterrewacht Leiden (NL), KNMI (NL), ASTRIUM Ltd (GB)
		150	VTT (FI) , Pajat Solutions (FIN), PLAN Finland (FIN)
	Total	1.68 M€	

of operational missions

- 3 April 2014
- Kourou spaceport
- Soyuz-2 rocket
- New era of Earth observation



Sentinel-1 maps earthquake

The biggest earthquake in 25 years struck California's Napa Valley in the early hours of 24 August 2014. By processing two Sentinel-1A images, acquired on 7 August and 31 August 2014 an interferogram was generated. Deformation on the ground causes phase changes in radar signals that appear as the rainbow-coloured patterns around the Napa Valley. Each colour cycle corresponds to a deformation of 28 mm deformation. The maximum deformation is more than 10 cm, and an area of about 30x30 km was affected significantly.

Copyright: Copernicus data (2014)/ESA/PPO.labs/Norut/COMET-SEOM Insarap study

ITTs in preparation - Contracts to be awarded **in 2014/2015** (total of 6.65 M€) :

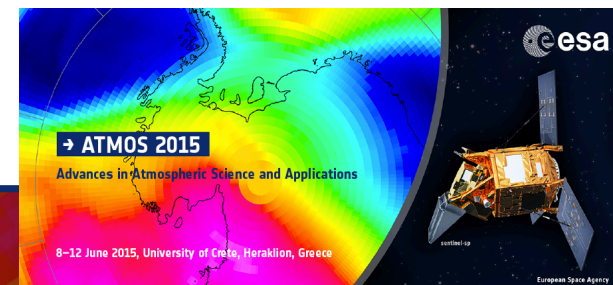
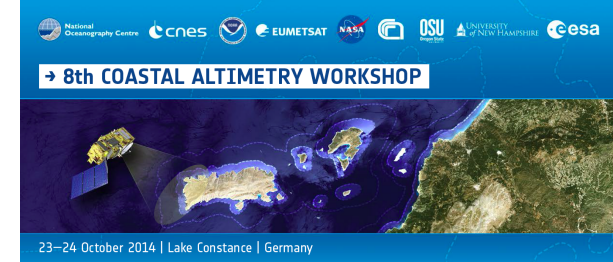
SEOM Call	Subject	Cost	ITT Status
S1-4SCI Ocean	* TOPS mode & Polarisation in C-band (wide swath wind, wave, and current retrieval)	0.35 M€	in preparation Q4 2014
S1-4SCI Land	* Land Cover * Vegetation * Snow * Soil Moisture	1.0 M€	in preparation Q2 2015
S2-4SCI Land	Radiometric Validation* Atmospheric Corr. & Cloud*Classification* Multi-temporal Analysis* Coastal & Inland Water* Coral reefs	1.5 M€	in preparation Q2 2015
S3-4SCI SAR Altimetry	* Coastal * Hydro * Land * Altimetry-Echo	1.0 M€	in preparation ITT October 2014
S3-4SCI Land	* Surface-Atmosphere retrievals * Fire * LST*data scaling	1.0 M€	in preparation Q3 2015
S3-4SCI Ocean Color	* Carbon Pools in the Ocean * Integrated PAR * Extreme Case2 Waters	0.8 M€	ITT out July 2014 Under evaluation
SY-4SCI Synergy	* S1-S2 Land cover & agricultural mapping products * S2-S3 New type of Vegetation products * S5P-S3 Phytoplankton Functional Types (PFTs) * S1-2-3 Ocean virtual laboratory	1.0 M€	ITT out. Proposal by end June. Activities to start Q4-2014
Total		6.65 M€	

ITTs in preparation - Contracts to be awarded **in 2015** (total of 1M€) :

SEOM Call	Subject	Cost	ITT Status
S5P-4SCI Atmosphere	<ul style="list-style-type: none"> • Volcanic Emissions (e.g. sacs.aeronomie.be, vast.nilu.no) • Exploit Synergies UV-IR bands (e.g. ozone) • New Product Development: Fluorescence (Oxygen A-Band) • Cloud Properties (Essential Climate Variable demonstration using the Oxygen A-Band) • Air Quality 	1.0 M€	in preparation – to be issued during Q1 2015
Total		1.0 M€	

- ◆ **S2-Science WS** - ESRIN 20-22 May 2014
<http://seom.esa.int/S2forScience2014/>
- ◆ **8th Coastal Altimetry WS** – Konstanz 23-24 Oct 2014
<http://www.coastalaltimetry.org/>
- ◆ **POLINSAR & 1st BIOMASS WS** - ESRIN 26-30 Jan 2015
<http://seom.esa.int/polinsar-biomass2015/>
- ◆ **9th FRINGE WS** - ESRIN 23-27 Mar 2015
<http://seom.esa.int/fringe2015/>
- ◆ **S3-Science WS** - ESRIN 2-5 June 2015
<http://seom.esa.int/S3forScience2015/>
- ◆ **Atmospheric Science Conference** – University of Crete -
8-12 June 2015 - <http://seom.esa.int/atmos2015/>
- ◆ **SEASAR** - ESRIN September 2015

→ **ADVANCED ATMOSPHERIC TRAINING COURSE 2014**
27–31 October 2014 | Forschungszentrum Jülich, Germany



- 400+ participants from 44 countries
- 50 oral presentations 160 posters
- Session summaries and recommendations available on-line at:

seom.esa.int/S2forScience2014/



- ◆ **EO Summer School on “Earth System Monitoring & Modeling”** 4-14 Aug 2014, ESRIN
200 applications; 73 selected
- ◆ **Land Remote Sensing** 8-12 Sep 2014, Valencia (E)
173 applicants , 70 selected
- ◆ **SAR Altimetry**, 21-22 Oct 2014, Konstanz (D)
Deadline for Registration: 1 Aug 2014
- ◆ **Atmospheric Remote Sensing**, 27-31 Oct 2014
Research Centre Jülich, (D) , 42 applications, 28 selected
- ◆ **Radar Polarimetry** Training, 19-23 Jan 2015, ESRIN
Application Submission (closing): 30 Sep 2014
- ◆ **Ocean Remote Sensing**, TBD, 2015 Q3
- ◆ **The Living Planet Fellowship – Call for Research Proposals**
(closure was end June 2014) 7 Post Doc grants for scientific exploitation of the sentinels (one on Atmosphere)



<https://earth.esa.int/web/eo-summer-school>

*2014 Summer School
70 early career scientists,
200 applications,
12+ teachers*





Sentinel-1 at a glance

- A new era in Earth observation
- Facts and figures

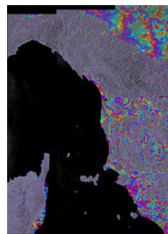
[ESA](#) > [Our Activities](#) > [Observing the Earth](#) > [Copernicus](#) > [Sentinel-1](#)



Search here



SENTINEL-1 POISED TO MONITOR MOTION



New views from Sentinel-1A

26 August 2014 Although it was only launched a few months ago and is still being commissioned, the new Sentinel-1A radar satellite has already shown that it can be used to generate 3D models of Earth's surface and will be able to closely monitor land and ice surface deformation.

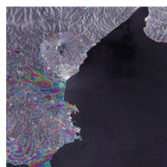
As the first in a fleet of satellite missions for Europe's Copernicus environmental monitoring programme, Sentinel-1A was launched on 3 April. It carries an advanced radar instrument to image Earth's surface through cloud and rain, regardless of whether it is day or night.

Among its many applications it will routinely monitor shipping zones, map sea ice and provide information on winds and waves for marine traffic, track changes in the way land is being used, provide imagery for rapid response to disasters such as floods, and monitor uplift and subsidence.

The satellite reached its operational orbit on 7 August and just 12 days later, its radar images were used to generate 'interferograms' that map the topography of parts of Italy and Norway.

Synthetic aperture radar interferometry – or InSAR – is a technique where two or more satellite radar images acquired over the same area are combined to produce an interferogram.

These are important products for mapping topography to produce 'digital elevation models' and to monitor surface deformation caused by, for example, mining, earthquakes, volcanic activity, melting permafrost and glacial flow.



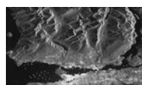
Etna slopes



The rainbow-coloured fringes in these new images demonstrate the



Sentinel-1



Data access & technical information



Operations

Related links

- European Commission Copernicus site
- Northern Research Institute
- DLR-Remote Sensing Technology Institute
- DLR-Microwaves and Radar Institute
- Scientific exploitation of operational missions



Microwaves and Radar Institute

News

Institute

Departments

Compact Test Range

Projects

TanDEM-X Science

Tandem-L Science

Publications

Awards

Jobs

EUSAR 2014

Zukunftspreis 2012

Archive - Conferences

How to find us

Microwaves and Radar Institute

Prof. Dr.-Ing. Alberto Moreira
Director of the Institute, Wessling



Microwaves and Radar Institute

With its know-how and expertise in passive and active microwave remote sensing, the Microwaves and Radar Institute contributes to the development and advancement of ground-based, airborne and spaceborne sensors. The focus of its research work is on the conception and development of new synthetic aperture radar (SAR) techniques and systems, as well as sensor-specific applications.

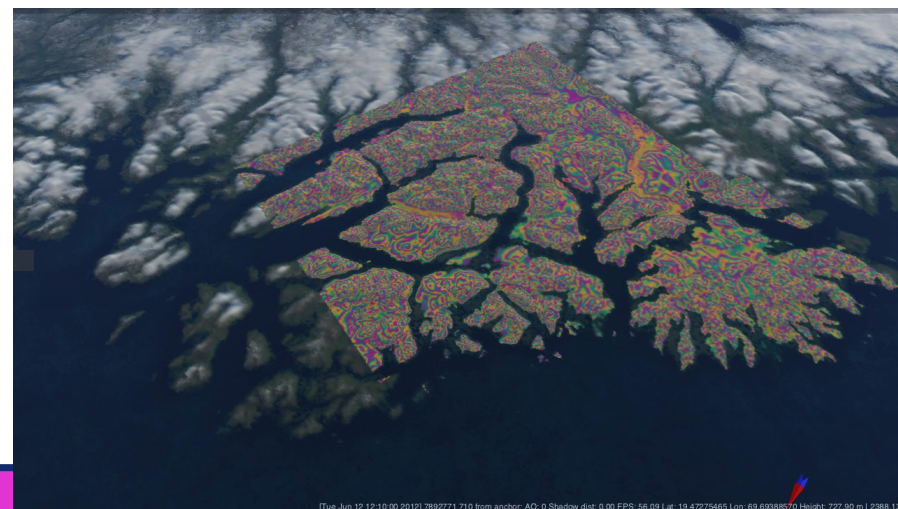
News



Sentinel-1 poised to monitor motion

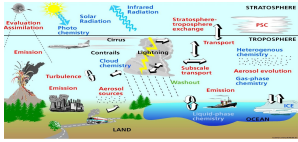
26 August 2014

Although it was only launched a few months ago and is still being commissioned, the new Sentinel-1A radar satellite has already shown that it can be used to generate 3D models of Earth's surface and will be able to closely monitor land and ice surface deformation. The Microwaves and Radar Institute has been involved in the computation of the first Sentinel-1A interferograms in the new interferometric wide swath (IW) mode, providing in this way support to ESA.

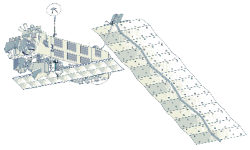


- New exploitation element focused on scientific exploitation (Sentinels)
- Opportunities for R&D
- Development of scientific toolboxes ongoing
- Regular Training for next generation EO scientists
- Regular Science users workshop consultations
- Work plan based on science user recommendations and approved at PBEO (every year)

Visit <http://seom.esa.int>



Train young scientists on the state of the art in space-based atmospheric science.



Enable a better understanding of the key concepts of atmospheric satellite missions and retrieval algorithms.



Provide hands-on experience with tools and methods used for the exploitation of atmospheric satellite data.



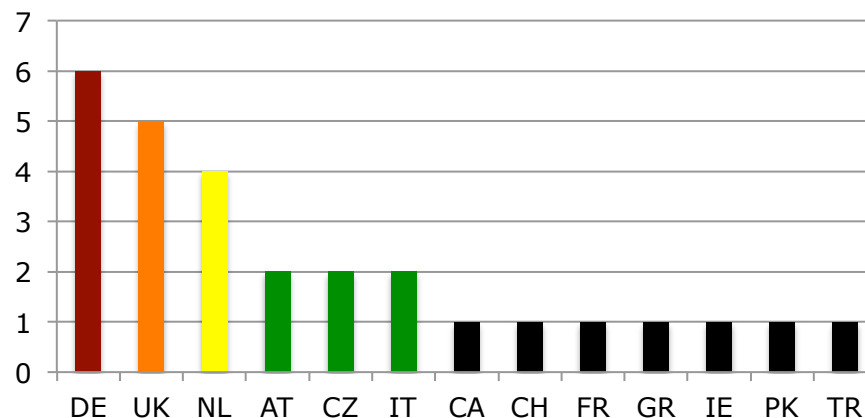
Give you the theoretical and practical framework for further studies.



Prepare for the Sentinel 5 P mission.

- 28 participants selected from 42 applications
- 24 different institutes from 13 different countries are being represented
- Education levels: PhD, post-doc

Participants/Country



- **M. van Roozendaal, T. Verhoelst - *Belgian Institute for Space Aeronomy***
- **V-H. Peuch - *European Centre for Medium-Range Weather Forecasts***
- **Y-L. Desnos, C. Zehner – *European Space Agency***
- **T. Kaminski – *FastOpt***
- **G. de Leeuw - *Finnish Meteorological Institute***
- **M. Riese, H. Elbern, M. Schultz, P. Preusse – *Forschungs Zentrum Juelich***
- **M. Hoepfner, P. Braesicke - *Karlsruhe Institute of Technology***
- **F. Prata – *Norwegian Institute for Air Research***
- **C. Poulsen - *Rutherford Appleton Laboratory***
- **S. Niemeijer - *S&T***
- **M. Buchwitz - *University Bremen***
- **O. Tarasova - *World Meteorological Organization***

Day 1 – Monday 27 October: Opening and Data Sessions

Day 2 – Tuesday 28 October – Retrieval and Validation Sessions

Day 3 – Wednesday 29 October – Applications Sessions

Day 4 – Thursday 30 October – Modelling and Data Assimilation Sessions

Day 5 – Friday 31 October – Future Challenges and Closing Session

Social Events: Monday and Wednesday Evening

- Attendance will be checked for all students
- Diploma is based on the attendance

Wish you a fruitful week!