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EXCELSIOR Project

H2020-WIDESPREAD-2018-2020 | Grant Agreement No 857510	
Project full title:	**ERATOSTHENES: Excellence Research Centre for Earth Surveillance and Space-Based Monitoring of the Environment**
Project acronym:	**EXCELSIOR**
Work Package:	**WP6 Knowledge transfer and capacity building**
Deliverable:	**D6.2 Workplan for transfer of knowledge and experience**
Version:	**Final D6.2**
Dissemination level:	**Public**

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	**H2020-WIDESPREAD-2018-2020/ H2020-WIDESPREAD-2018-01** **Grant Agreement No 857510** This project is funded by the **EUROPEAN COMMISSION** in the Framework Programme for Research and Innovation (2014-2020).
Call / Topic:	**H2020-WIDESPREAD-2018-01 /** **WIDESPREAD-01-2018-2019** **Teaming Phase 2**
Project full title:	**ERATOSTHENES: Excellence Research Centre for Earth Surveillance and Space-Based Monitoring of the Environment**
Project acronym:	**EXCELSIOR**
Work Package (WP): Task (T):	**WP6 Knowledge Transfer and Capacity Building** **T6.1 Personnel mobility scheme**
Deliverable (D):	**D6.2 Workplan for transfer of knowledge and experience**
Due date of deliverable:	**30 September 2021** **(Month 24 of the project)** / **Version: Final D6.2**
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Start date of project:	**1 October 2019** / Duration: **84 months**
Dissemination Level:	**Public**

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Document Sign-off

Nature	Name	Role	Partner	Date
DRAFT	K. THEMISTOCLEOUS	Project Technical Manager	CUT	01/08/2021
REVIEWED	K. NEOCLEOUS	Quality Assurance Manager	CUT	06/09/2021
REVIEWED	Gunter SCHEIER Mariza KASKARA Johannes BÜHL Diofantos HADJIMITSIS	WP6 Participants	DLR NOA CUT	23/09/2021
APPROVED	All partners			29/09/2021

Work Package 6: Knowledge Transfer and Capacity Building

D6.2 Workplan for transfer of knowledge and experience

Sections to be protected	Description	Owner	Access Rights	
			Period	Type*
None			-	-

*PD: Public dissemination CA: Confidentiality Agreement required for disclosure

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Executive Summary

This document represents the 'Workplan for transfer of knowledge and experience' (deliverable D.6.2) for the EXCELSIOR project. It focuses on the scope and activities of WP6 "Knowledge Transfer and Capacity Building". The main objective of WP6 is to coordinate and manage the knowledge transfer and capacity building that will take place during the EXCELSIOR project with Strategic Partners. The document will provide a workplan of how knowledge transfer and capacity building will take place between the Strategic Partners via workshops, seminars and secondments. This plan relies heavily on the extensive work done at the preparation of the project in defining the seminars, workshops and secondments that will take place between the Strategic Partners.

This deliverable focuses on the initial workplan developed for Capacity Building Scheme A, which runs from M26 to M44. The deliverable includes the capacity building and knowledge transfer activities that will be conducted by the Strategic Partners DLR, NOA and TROPOS. The course description and program for selected trainings can be found in the appendices.

The present document constitutes the 'Workplan for transfer of knowledge and experience' for Capacity Building Scheme period 'A' in the framework of the EXCELSIOR project, dedicated to Task T6.1 'Personnel Mobility Scheme' under work package WP6 'Knowledge Transfer and Capacity Building'. D6.2 focuses on the trainings that will take place during the Capacity Building Scheme A of the project. This document provides a guideline of the knowledge transfer activities, but it is not limited to the activities that will take place during Capacity Building Scheme A. The Strategic Partners suggested that a flexible workplan is needed in order to identify the gaps and needs of the researchers of the ECoE, especially during the first Capacity Building Scheme and adjust the workplan as needed in order to facilitate more effective knowledge transfer and capacity building. The secondments will be selected by the Strategic Partners as needed, during the knowledge transfer activities, parallel to the demonstration projects in WP7. Selected descriptions of knowledge transfer activities are featured in Appendix A and Appendix B.

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Abbreviations

ACTRIS	Aerosols, Clouds, and Trace gases Research Infrastructure
CUT	Cyprus University of Technology
DAS	Data Acquisition Station
DEC-MTCW	Department of Electronic Communications of the Ministry of Transport, Communications and Works
DIAS	Copernicus Data and Information Access Services
DLR	German Aerospace Centre
EMMENA	Eastern Mediterranean Middle East and North Africa
EO	Earth Observation
EXCELSIOR	Eratosthenes: Excellence Research Centre for Earth Surveillance and Space-based Monitoring of the Environment
GBS	Ground-based Remote Sensing Station
NOA	National Observatory of Athens
RS	Remote Sensing
TBD	To be determined
TROPOS	Leibniz Institute for TROPOSpheric Research

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1 Introduction

This deliverable will focus on the initial workplan for transfer of knowledge and experience. In WP6, in order to enable capacity building and knowledge transfer, there will be several activating including workshops, trainings, seminars and webinars from the Strategic Partners to the ECoE researchers in order to increase the capacity building of the Centre. This plan will be regularly updated according to the needs of the ECoE.

Work Package 6 is for Knowledge Transfer and Capacity Building consists of four tasks: Task 1: Personnel mobility scheme, Task 2: secondments between ECoE, strategic Task 3: Partners and partnering organisations, technical skills development program and Task 4: extroversion programme. The actions of these tasks were adjusted in order to into consideration any impact associated with the Covid-19 pandemic, the establishment of the ECoE, personnel recruitment and the contract amendment procedures in order to add ECoE as a partner. These resulting adjustments were addressed in the contract amendment.

Task 6.1, Personnel mobility scheme, was divided into three capacity building schemes that were addressed in the proposal and the secondments within the partner organisations will commence later in the project. The Capacity Building Scheme A starts Month 26 and ends on Month 44. The Strategic Partners, TROPOS, DLR and NOA, have created a workplan for the transfer of knowledge activities based on the needs of the ECoE that will be updated according to the identified knowledge gaps and the needs of the ECoE.

In this deliverable,

Chapter 1 provides a brief introduction to Capacity Building Scheme A;

Chapter 2 provides detailed information regarding the workplan for Capacity Building Scheme A, including the initial capacity building and knowledge transfer activities for each Strategic Partner;

Chapter 3 provides information on the necessary documentation that will be included in the capacity building and knowledge transfer activities;

Chapter 4 is the concluding chapter of the deliverable

Appendix A includes selected trainings by TROPOS scheduled for Capacity Building Scheme A;

Appendix B includes selected trainings by DLR scheduled for Capacity Building Scheme A;

Appendix C includes selected trainings by NOA scheduled for Capacity Building Scheme A and

Appendix D includes a draft Training/ Workshop / Webinar document forms.

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2 Capacity Building Scheme A

This report provides information regarding Capacity Building Scheme A, which will be followed by Capacity Building Scheme B and Capacity Building Scheme C. The Capacity Building Scheme A starts at Month 26 and ends on Month 44. A central objective of the EXCELSIOR project is to enhance capacity building and promote knowledge transfer from the Strategic Partners to the ECoE. To that end, the Capacity Building Schemes have been designed to provide capacity building and knowledge transfer activities throughout the lifetime of the EXCELSIOR project. This chapter provides an overview of the activities that each Strategic Partner has drafted to take place during Capacity Building Scheme A.

2.1 Capacity Building

Capacity-building is defined as the process of developing and strengthening the skills, abilities, processes and resources that organizations and communities need to thrive. In the EXCELSIOR, capacity building activities include training, learning, knowledge transfer, skill development, coaching, mutual support and professional development (Figure 1). The EXCELSIOR project has developed a workplan for how the Strategic Partners will provide knowledge transfer and capacity building via workshops, seminars and trainings.

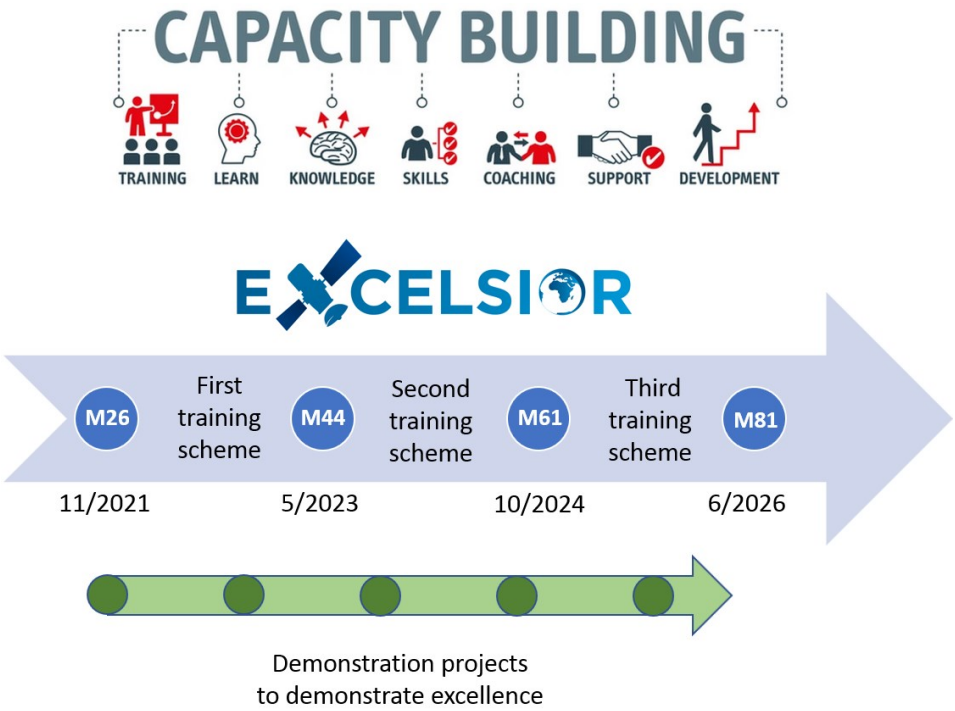

Figure 1. Capacity Building Schemes and Demonstration Projects

The workplan for capacity building with the Strategic Partners is dividing into three periods: Capacity Building Scheme A, Capacity Building Scheme B and Capacity Building Scheme C. To maximize the efficiency of capacity building, five demonstration project periods will take place with the Strategic

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Partners throughout the lifetime of the EXCELSIOR project. In this way, the valuable skills and knowledge gained during the Capacity Building Schemes can be applied to the Demonstration Projects.

The Strategic Partners have prepared activities that are designed as an initial training. This has been done to identify the skill set or knowledge that the trainee possesses, so that the activity can be adjusted accordingly. This is critical, as new researchers will be joining the ECoE and the skills and know-how of individuals may vary.

Each Strategic Partner has provided the ECoE with capacity building and knowledge transfer activities that will be done in the clusters of Society Resilience, Environment and Climate, and Big Earth Data Analytics as well as the thematic areas of Atmosphere, Agriculture Monitoring, Land, Water, Disaster Risk Reduction Earthquakes/ Landslides, Disasters Risk Reduction Floods, Disasters Risk Reduction /Fire Management, Cultural Heritage, Maritime Safety And Security and Information extraction (Figure 2). Even though initial persons from the existing researchers have been identified from each thematic area to participate in capacity building and knowledge transfer activities, this will be adjusted as new personnel are hired by the ECoE.

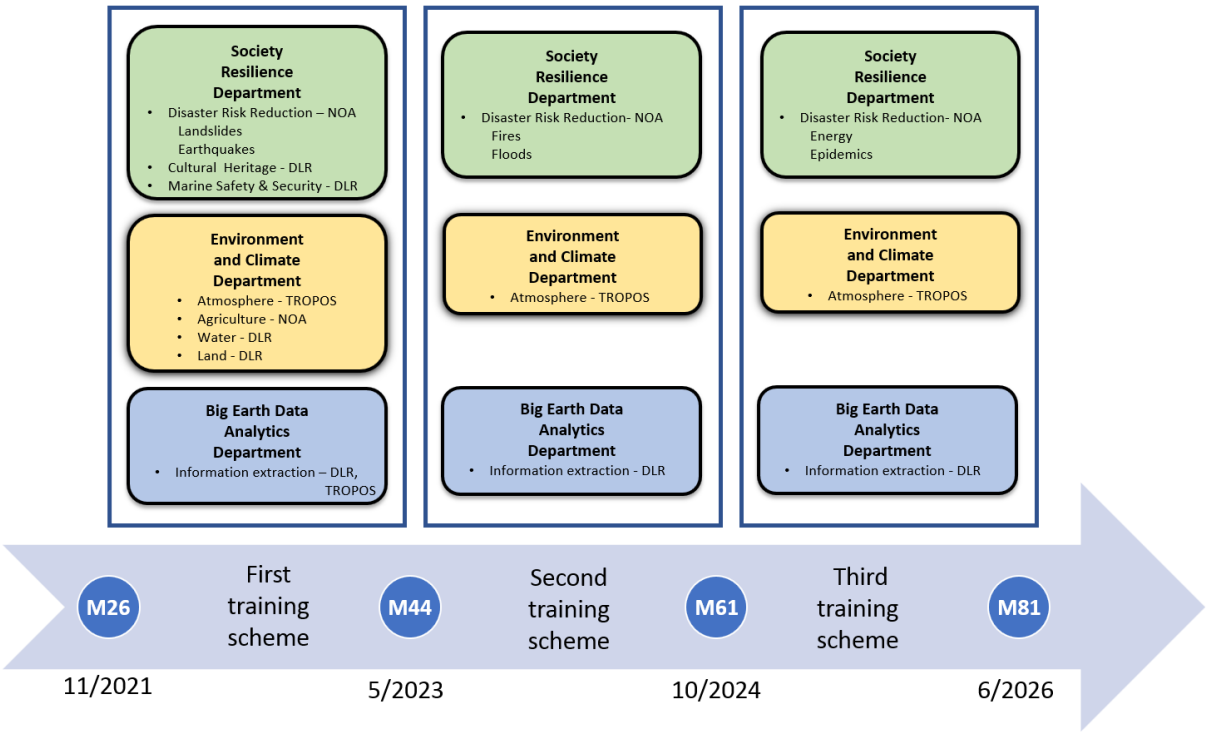

Figure 2. Topics for the first, second and third training scheme.

The trainees consist of existing researchers of the Cyprus University of Technology that have been transferred to ECoE and new researchers that will be hired by ECoE. The Strategic Partners provided the initial basic trainings listed in section 2.2 in order to evaluate the existing capacity and knowledge of the researchers and identify the needs for any additional training and capacity building. The trainings were provided by the Strategic Partners as an initial workplan to outline the capacity building and

knowledge transfer activities that will be done by each Strategic Partner. Following these activities, additional capacity building and knowledge transfer activities will be implemented during the Capacity Building Scheme A.

Figure 3 provides a graphic as to how the initial capacity building workplan will function. The capacity building activities and demonstration projects (1) from the Strategic Partners will be conducted. These will be conducted on an initial level, as to identify the level of skills and know-how of the trainee. As the trainings are completed, an evaluation of the workplan (2) will be done. Following the completed activities, the Strategic Partners and the trainees will evaluate the effectiveness of the activity. Through the verification form (Appendix C), both the Strategic Partners and the trainee will be able to identify the strengths and weaknesses of the capacity building and knowledge training activity. Once this is done, the Strategic Partner will be able to identify the gaps in the trainee's skill set/know how and identify if any additional training is required (3). It is expected that trainees may have a more developed or less developed skill and knowledge level that previously anticipated. In order to optimize the effectiveness of the capacity building and knowledge transfer activities, the Strategic Partners will adjust the capacity building activities and the workplan (4) to be in line with the needs of the trainees. This method will be applied to all activities within the capacity building workplan, thereby providing a flexible structure that will be designed to facilitate knowledge and skills of the ECoE researchers.

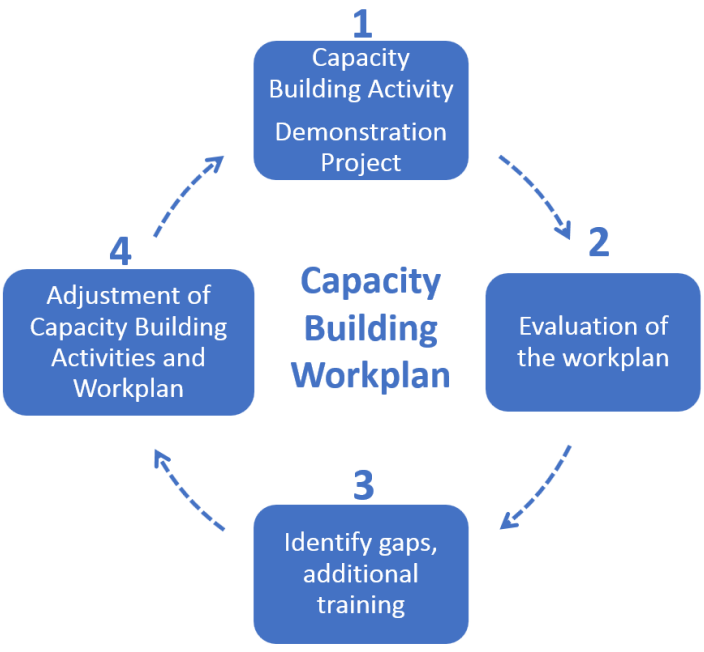

Figure 3. Capacity Building Workplan

After the implementation of the capacity building and knowledge transfer activities by the Strategic Partners, an updated report will adjust and update all the activities conducted and the results of the capacity building and knowledge transfer activities will be evaluated to identify any gaps and additional needs for Capacity Building Scheme B within the earmarked resources of the project. The Strategic Partners believe that this evaluation through the Capacity Building Period A is critical to identify and

evaluate the capacity needs of the ECoE. This interaction will also be tested in WP7 in the demonstration projects, where the interaction and collaboration of Strategic Partners and ECoE researchers will clearly identify any gaps or additional capacity building activities.

2.2 Capacity Building and Knowledge Transfer Workplan

The workplan of the capacity building and knowledge transfer activities by the Strategic Partners is a guideline to provide flexibility to the Strategic Partners to add further trainings as needed. The Strategic Partners have provided initial information regarding the capacity building and knowledge transfer activities that will be conducted, the type of activity and the number of days that each activity will require. The below table includes a description of the capacity building and knowledge transfer activities for each Strategic Partner, the type of activity, the month and week that it has been scheduled for, and the number of days that the activity will require.

Table 1. Capacity building and knowledge transfer activities by date

Partner	Capacity Building / Knowledge Transfer Activity	Type of Activity	Month, Week	# of days
NOA	Seminar on crop classification and crop monitoring for the control of the CAP: the RECAP, Sen2Agri and EOPEN paradigms. Content: DIAS platforms, Acquisition of Satellite Imagery & Data pre-processing, Data fusion S1 & S2 data, Introduction to the DataCube, Crop classification algorithm, Grassland mowing algorithm	Seminar 1	M26, WK4 (November)	4
NOA	Earthquakes/Landslides: Basic training on data processing to ECoE based e.g. on the NOA's workflow for GEObservatory. Content: Acquisition of Satellite Imagery, Processing of Imagery, Theory on Persistent Scatter Interferometry methods for geo-hazards monitoring, Applications including earthquakes, landslides, volcanic activity, construction activity, etc.	Training 1	M28, WK2 (January)	2
DLR	Webinar on processing of earth observation data in cloud environments. The activity will cover multispectral (Sentinel-2, Landsat, etc.) and SAR data (Sentinel-1). The thematic context will cover lakes, wetlands, river basins, coasts, but also agricultural areas and contribute to integrated water management strategies.- Cloud infrastructures, GEE; Data storage; Processing and analysis	Webinar 1	M28, WK3 (January)	1

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Partner	Capacity Building / Knowledge Transfer Activity	Type of Activity	Month, Week	# of days
NOA	Disaster Risk Reduction: Remote training of CUT staff in the disaster management sector offered from NOA in Athens Online remote seminars, both theory and hands-on sessions The theoretical part focuses on: Overall approach from risk assessment to mitigation measures (hazard, exposure, susceptibility, vulnerability) & Techniques for damage assessment using EO data (optical, SAR) in support to historical damage assessment, trends of damage behavior and dynamic assessment. In the hands-on sessions, Copernicus data will be analyzed and applications are envisaged, with CH applications to be agreed on and prepared together with CUT members.	Training 2	M28, WK4 (January)	2
NOA	Floods: Overview of using data and state-of-the-art technologies, models and scientific approaches wrt: Diachronic Sentinel-based flood extent mapping, & NWP forecasting system for early warning and hydrologic and hydraulic models for real time monitoring	Training 3	M28, WK4 (January)	2
NOA	Exploiting High Performance and Distributed Computing for large-scale agriculture monitoring	Seminar 2	M29, WK2 (February)	2
NOA	**Floods:** Overview of assimilation techniques with the integration of Sentinel-based flood extent mapping with other data sources. Ingestion of crowdsourced and EO data for real time monitoring and Flood frequency analysis	Training 4	M29, WK1-4 (February)	10
NOA	Fires: Overview of using multisource EO/in-situ/sensor data and state-of-the-art technologies, models and scientific approaches to support fire fighting in all phases of crisis management (preparedness, during crisis, post crisis) wrt: Dynamic fire risk; Damage assessment (post crisis); Early detection; Fire monitoring	Training 5	M30, WK1 (March)	2
TROPOS	Lecture about remote sensing of wind	Lecture 1	M30, WK3 (March)	1
TROPOS	Lecture about atmospheric remote sensing	Lecture 2	M30, WK3	1

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Partner	Capacity Building / Knowledge Transfer Activity	Type of Activity	Month, Week	# of days
			(March)	
TROPOS	GBS Maintenance and on-site operation	Training 6	M31, WK2 (April)	4
DLR	Remote training of CUT staff in processing of optical sensor data offerered from DLR in Oberpfaffenhofen. Online remote seminars, both theory and hands-on sessions Focus is imaging spectroscopy and processing of time-series earth observation data in the cloud. The theoretical part focuses on hyperspectral data, their applications and recent spaceborne imaging spectrometers. In the hands-on sessions, Copernicus data are analyzed and explored on-the-fly through Google Earth Engine. Environmental applications are envisaged, with CH applications to be agreed on and prepared together with CUT members.	Seminar 3	M32, WK3 (May)	3
DLR	Theory and applications: Processing System Management (PSM) and Operating Tool (OT) based on operational ground segment components e.g. Sentninel-1, Training on EO data handling, implementation of data interfaces e.g. direct downlink or Copernicus Data Hub, following the rules for open data policy), Training on basics how to use of the data analysis framework which includes e.g. Level 1 (L1b) Sentinel-1 Instrument Processing Facility (IPF) as well as monitoring and alarm functionalities Training on configuration and setup, e.g. definition of AOI and subscription rules and generation of planning information e.g. ground station schedule based on the requested AOI. System overvies and training will be prepared based on the processing system developed for Sentinel-1	Seminar 4	M32, WK4 (May)	3

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Partner	Capacity Building / Knowledge Transfer Activity	Type of Activity	Month, Week	# of days
DLR	Theory and applications: Teaching of basics for maritime information extraction from Sythetic Apeture Radar SAR and hands-on software training. Fundamentals of methods and algorithms used to derive maritime information such as sea state, ocean surface wind, ship detection and classification, ice and oil detection. This Background is needed to understand and adjust the user-configurable parameters in Training on DLR's SAR-AIS Integrated Toolbox (SAINT) software. In addition hand-on training will be provided with the SAINT software including operation and configuration of SAINT and ancillary software, settings for operational processing to cover different types of sensors and products, as well as validation of the generated L2 maritime information products.	Seminar 5	M33, WK1 (June)	3
TROPOS	Cloud Radar Operation	Workshop 1	M33, WK3 (June)	2
TROPOS	PollyXT Operation	Training 12	M36, WK3-4 (September)	2
TROPOS	Lecture about microwave and radar remote sensing	Lecture 3	M37, WK1 to M40, WK4 (October – January)	14
TROPOS	Lecture about optical remote sensing lidar and radar remote sensing	Lecture 4	M37, WK1 to M40, WK4 (October – January)	14
DLR	Basic training on optical data processing to ECoE based e.g. on the DLR processing chain CATENA. Content: • Acquisition and Metadata of Satellite Imagery • Processing of Satellite Imagery • Structure of CATENA • Processing Chains • Step-by-step: Orthorectification	Training 7	M38, WK1 (November)	2
DLR	First Special-Topic training on optical data processing to ECoE based on the DLR	Training 8	M39, WK1 (December)	2

Partner	Capacity Building / Knowledge Transfer Activity	Type of Activity	Month, Week	# of days
	processing chain CATENA. This training includes the automatic processing of very high resolution optical data from satellites like WorldView or Pleiades for DSM- and Orthoimage generation. Content: • (Multi-)Stereo Satellite Imagery • Processing Chains MultiStereo and Stereo • Step-by-step: Generating DSMs and Orthoimages			
DLR	Second Special-Topic training on optical data processing to ECoE based on the DLR processing chain CATENA. This training includes the automatic processing of Sentinel-2 data for atmospheric correction using PACO and MAJA. Content: • Structure and Metadata of Sentinel-2 images • Principles of atmospheric correction • Processing Chains and Workflows • Step-by-step: the MAJA processing workflow	Training 9	M40, WK2 (January)	2
DLR	Third Special-Topic training on deployment of the DLR processing chain CATENA using Docker-Containers. Content: • Principle of Docker • Building a Docker-Container from a CATENA processing chain • Running a Docker Container • Step-by-step: building and running a PACO Docker container	Training 10	M41, WK1 (February)	2
DLR	Introduction to SAR and InSAR: - About 5 hours prerecorded video lectures on microwave remote sensing and SAR - 1 hour live Q&A on SAR - About 4 hours prerecorded video lectures on SAR interferometry - 1 hour live Q&A on InSAR	Training 11	M41, WK2 (February)	2
TROPOS	GBS instrument integration at Leipzig	Workshop 2	M41, WK3-4 (February)	10
TROPOS	GBS Maintenance and on-site operation	Training 12	M42, WK1 (March)	4
TROPOS	GBS Data Evaluation Workshop	Workshop 3	M42, WK2	2

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Partner	Capacity Building / Knowledge Transfer Activity	Type of Activity	Month, Week	# of days
			(March)	
TROPOS	Lecture about atmospheric remote sensing	Lecture 5	M42, WK3 (March)	1
TROPOS	Training on usage of LARDA³ remote sensing data cube	Training 13	M42, WK4 (March)	5
NOA	Set-up of network of in-situ sensors and training on the fusion modeling /assimilating satellite and in-situ/sensor data	Workshop 4	M43, WK4 (April)	4
TROPOS	Manual and automated Raman lidar evaluation	Training 14	M44, WK1 (May)	3
TROPOS	Cloud Radar Operation	Workshop 5	M44, WK2 (May)	2

The duration, date and sequence of the training can be adjusted according to the needs and availability of the trainees.

Table 2 features the GANTT chart for Capacity Building Workplan for Capacity Building Scheme A. As is evident, the activities are scheduled throughout the timeframe allocated for Capacity Building Scheme A. This has been done so as to provide the trainees the ability to fully benefit from the trainings by incorporating the new knowledge into their skill set. This also provides the opportunity for the trainees to identify gaps that may exist in their skills and/or identify the need for further training.

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Table 2. GANTT chart for Capacity Building Workplan

		Month 26 November 2021				Month 27 December 2021				Month 28 January 2022				Month 29 February 2022				Month 30 March 2022				Month 31 April 2022				Month 32 May 2022				Month 33 June 2022				Month 34 July 2022			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NOA	Seminar 1				4																																
NOA	Seminar 2														2																						
DLR	Webinar 1											1																									
NOA	Training 1											2																									
NOA	Training 2												2																								
NOA	Training 3												2																								
NOA	Training 4													3	2	3	2																				
NOA	Training 5																	2																			
TROPOS	Lecture 1																			1																	
TROPOS	Lecture 2																			1																	
TROPOS	Training 6																						4														
DLR	Seminar 3																											3									
DLR	Seminar 4																												3								
DLR	Seminar 5																													3							
TROPOS	Workshop 1																															2					
TROPOS	Lecture 3																																				
TROPOS	Lecture 4																																				
DLR	Training 7																																				
DLR	Training 8																																				
DLR	Training 9																																				
DLR	Training 10																																				
DLR	Training 11																																				
TROPOS	Workshop 2																																				
TROPOS	Training 12																																				
TROPOS	Workshop 3																																				
TROPOS	Lecture 5																																				
TROPOS	Training 13																																				
NOA	Workshop 4																																				
TROPOS	Training 14																																				
TROPOS	Workshop 5																																				

		Month 35 August 2022				Month 36 September 2022				Month 37 October 2022				Month 38 November 2022				Month 39 December 2022				Month 40 January 2023				Month 41 February 2023				Month 42 March 2023				Month 43 April 2023				Month 44 May 2023			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NOA	Seminar 1																																								
NOA	Seminar 2																																								
DLR	Webinar 1																																								
NOA	Training 1																																								
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DLR	Seminar 5																																								
TROPOS	Workshop 1																																								
TROPOS	Lecture 3									1	1	1	1	1	1	1	1	1	1				1	1	1																
TROPOS	Lecture 4									1	1	1	1	1	1	1	1	1	1				1	1	1																
DLR	Training 7													2																											
DLR	Training 8																	2																							
DLR	Training 9																						2																		
DLR	Training 10																									2															
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TROPOS	Workshop 2																											5	5												
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TROPOS	Workshop 3																														2										
TROPOS	Lecture 5																															1									
TROPOS	Training 13																																5								
NOA	Workshop 4																																				4				
TROPOS	Training 14																																					3			
TROPOS	Workshop 5																																						2		

Legend: Seminar, Training, Workshop, Lecture

*The number in each cell refers to the number of days in the specific week that will be allocated for the training. The duration, date, content and number of trainings can be adjusted according to the needs and availability of the trainers and trainees.

2.3 Strategic Partners

2.3.1 TROPOS

TROPOS will provide the following capacity building and knowledge transfer activities:

- Lecture about Optical remote sensing
- Lecture about Microwave and radar remote sensing
- Lecture about spaceborne lidar and radar remote sensing
- Lecture about remote sensing of wind
- GBS instrument integration at Leipzig
- GBS Data Evaluation Workshop
- Cloud Radar Operation
- PollyXT Operation
- GBS Maintenance and on-site operation
- Manual and automated Raman lidar evaluation
- Training on usage of LARDA³ remote sensing data cube

2.3.2 DLR

DLR will provide the following capacity building and knowledge transfer activities:

- *Webinar on processing of earth observation data in cloud environments.* The activity will cover multispectral (Sentinel-2, Landsat, etc.) and SAR data (Sentinel-1). The thematic context will cover lakes, wetlands, river basins, coasts, but also agricultural areas and contribute to integrated water management strategies.-Cloud infrastructures, GEE; Data storage; Processing and analysis
- Remote training of CUT researchers in processing of optical sensor data. This will include online remote seminars and both theory and hands-on sessions. The focus is imaging spectroscopy and processing of time-series earth observation data in the cloud. The theoretical part focuses on hyperspectral data, their applications and recent spaceborne imaging spectrometers. In the hands-on sessions, Copernicus data are analyzed and explored on-the-fly through Google Earth Engine. Environmental applications are envisaged, with CH applications to be agreed on and prepared together with CUT members.
- Theory and applications: This will include training in Processing System Management (PSM) and Operating Tool (OT) based on operational ground segment components e.g. Sentninel-1. It will include training on EO data handling, implementation of data interfaces, such as direct downlink or Copernicus Data Hub, following the rules for open data policy), training on basics on the use of the data analysis framework which includes Level 1 (L1b) Sentinel-1 Instrument Processing Facility (IPF) as well as monitoring and alarm functionalities and training on configuration and setup, e.g. definition of AOI and subscription rules and generation of planning information e.g. ground station schedule based on the requested AOI. System overview and training will be prepared based on the processing system developed for Sentinel-1
- Theory and applications: Teaching of basics for maritime information extraction from Synthetic Aperture Radar SAR and hands-on software training (See Appendix A). Fundamentals of methods and algorithms used to derive maritime information such as sea state, ocean surface wind, ship

detection and classification, ice and oil detection. This Background is needed to understand and adjust the user-configurable parameters in Training on DLR's SAR-AIS Integrated Toolbox (SAINT) software. In addition, hand-on training will be provided with the SAINT software including operation and configuration of SAINT and ancillary software, settings for operational processing to cover different types of sensors and products, as well as validation of the generated L2 maritime information products.

- Basic training on optical data processing to ECoE based e.g. on the DLR processing chain CATENA. (See Appendix A)

  Content:
  - Acquisition and Metadata of Satellite Imagery
  - Processing of Satellite Imagery
  - Structure of CATENA
  - Processing Chains
  - Step-by-step: Orthorectification
- First Special-Topic training on optical data processing to ECoE based on the DLR processing chain CATENA. This training includes the automatic processing of very high resolution optical data from satellites like WorldView or Pleiades for DSM- and Orthoimage generation.

  Content:
  - (Multi-)Stereo Satellite Imagery
  - Processing Chains MultiStereo and Stereo
  - Step-by-step: Generating DSMs and Orthoimages
- Second Special-Topic training on optical data processing to ECoE based on the DLR processing chain CATENA. This training includes the automatic processing of Sentinel-2 data for atmospheric correction using PACO and MAJA.

  Content:
  - Structure and Metadata of Sentinel-2 images
  - Principles of atmospheric correction
  - Processing Chains and Workflows
  - Step-by-step: the MAJA processing workflow
- Introduction to SAR and InSAR: This will include training on microwave remote sensing and SAR and on SAR interferometry. About 5 hours prerecorded video lectures on microwave remote sensing and SAR, - 1 hour live Q&A on SAR, - About 4 hours prerecorded video lectures on SAR interferometry and - 1 hour live Q&A on InSAR"

2.3.3 NOA

NOA will provide the following capacity building and knowledge transfer activities:

- Seminar on crop classification and crop monitoring for the control of the CAP: the RECAP, Sen2Agri and EOPEN paradigms. Content: DIAS platforms, Acquisition of Satellite Imagery & Data pre-processing, Data fusion S1 & S2 data, Introduction to the DataCube, Crop classification algorithm, Grassland mowing algorithm (Appendix B)
- Exploiting High Performance and Distributed Computing for large-scale agriculture monitoring

- Earthquakes/Landslides (Appendix B): Basic training on data processing to ECoE based e.g. on the NOA's workflow for GEObservatory. Content: Acquisition of Satellite Imagery, Processing of Imagery, Theory on Persistent Scatter Interferometry methods for geo-hazards monitoring, Applications including earthquakes, landslides, volcanic activity, construction activity, etc.
- Disaster Risk Reduction (Appendix B): Remote training of CUT researchers in the disaster management sector offered from NOA in Athens. Online remote seminars, both theory and hands-on sessions. The theoretical part focuses on: Overall approach from risk assessment to mitigation measures (hazard, exposure, susceptibility, vulnerability) & Techniques for damage assessment using EO data (optical, SAR) in support to historical damage assessment, trends of damage behavior and dynamic assessment. In the hands-on sessions, Copernicus data will be analyzed and applications are envisaged, with CH applications to be agreed on and prepared together with CUT members."
- Floods: Overview of using data and state-of-the-art technologies, models and scientific approaches wrt: Diachronic Sentinel-based flood extent mapping, & NWP forecasting system for early warning and hydrologic and hydraulic models for real time monitoring
- Floods: Overview of assimilation techniques with the integration of Sentinel-based flood extent mapping with other data sources. Ingestion of crowdsourced and EO data for real time monitoring and Flood frequency analysis
- Fires: Overview of using multisource EO/in-situ/sensor data and state-of-the-art technologies, models and scientific approaches to support fire fighting in all phases of crisis management (preparedness, during crisis, post crisis) wrt: Dynamic fire risk; Damage assessment (post crisis); Early detection; Fire monitoring
- Set-up of network of in-situ sensors and training on the fusion modeling /assimilating satellite and in-situ/sensor data

3 Activity Forms

During the development of the workplan, two issues were raised: a) scheduling the activities to avoid overlap and b) evaluating gaps in capacity building/knowledge. To resolve these issues, thee forms were developed (Appendix D): The Training/ Workshop / Webinar form, Training/ Workshop / Webinar Trainer Verification form and Training/ Workshop / Webinar Trainee Evaluation form

3.1 Training/ Workshop / Webinar form

In order to prevent any scheduling conflicts, all capacity building and knowledge transfer activities require completion of the Training/ Workshop / Webinar form (Appendix D). The form includes the following sections:

- Title of Training
- Introduction, which will address why the Strategic Partners want to transfer the knowledge, what is the receiver's level of knowledge/expertise, will the knowledge be applied in the same or a different environment and what type of knowledge to be transferred.
- Strategic Partners
- Name of applicant
- Name of presenter(s)
- Number of Participants
- Duration of Training
- Location of Training
- Duration -Beginning/ end dates
- Type of Training
- Training skills required, which refers to the minimum requirements and capabilities of the trainees necessary for the training
- Training equipment
- Training objective, which clearly define the primary objective of the training
- Outcomes, which provide a detailed explanation of the anticipated outcomes of the training
- Program
- Activities

The form is required to be completed along with the training schedule and a detailed description of the training activities. The final approval is provided by the ECoE and/or the EXCELSIOR Strategic Partner committee and is authorized by the Project Manager and Project Coordinator.

3.2 Training/ Workshop / Webinar Trainer Verification form

Following the completion of the capacity building and knowledge transfer activity, a Training/ Workshop / Webinar Verification form needs to be completed. The goals of the verification form are (a) to provide documentation of the knowledge transfer and capacity building that took place during the training, (b) identify as practical skills developed during training that are transferable to the ECoE,

(c) identify what further training is necessary for successful knowledge-transfer and capacity building and (d) provide suggestions to improve knowledge transfer and capacity building through trainings.

The information from the trainer verification form will be used to identify capacity building and knowledge transfer needs that can be addressed in Capacity Training Scheme B and/or Capacity Training Scheme C. The verification form includes the following sections:

- Title of Training
- Strategic Partner
- Name of presenter(s)
- Number and names of Participants
- Duration of Training
- Location of Training
- Duration -Beginning/ end dates
- Type of Training
- Documentation. Documentation of attendance of the training is necessary. For on-site training, a timesheet or similar documentation should be provided from the Strategic Partner. For webinars, a video of the webinar and a copy of the power point presentation should be provided. Last, for workshops, documentation of attendance, such as a sign-in sheet should be provided.
- Actions resulting from Trainings. A detailed report regarding the actions resulting from the trainings, such as practical skills developed during training that are transferable to the ECoE, should be included.
- Deliverables resulting from Trainings. This includes all reports, presentations, journal articles, conference proceedings, trainings, etc. that have resulted from the training
- Evaluation of training by the Strategic Partners.
- Future trainings required. The trainee should indicate what further training is necessary for successful knowledge-transfer and capacity building.
- Recommendations. This should include detailed recommendations regarding how the training process could be improved or changed to facilitate knowledge transfer and capacity building, as well as if there is an alternative manner than the training can take place, such as onsite training, webinar, workshop, etc.)
- Supporting documents of the training.

The completed verification form is authorized by the Project Manager and Project Coordinator.

3.3 Training/ Workshop / Webinar Trainer Evaluation form

Following the completion of the capacity building and knowledge transfer activity, a Training/ Workshop / Webinar evaluation form will be completed by the trainees. The goals of the evaluation forms are to (a) identify as practical skills developed during training that are transferable to the ECoE, (b) identify what further training is necessary for successful knowledge-transfer and capacity building and (c) provide suggestions to improve knowledge transfer and capacity building through trainings.

The information from the evaluation form will be used to identify capacity building and knowledge transfer needs that can be addressed in Capacity Training Scheme B and/or Capacity Training Scheme C. The evaluation form includes the following sections:

- Title of Training
- Duration - dates
- Type of Training
- Evaluation of training by the trainee
- Future trainings required. The trainee should indicate what further training is necessary for successful knowledge-transfer and capacity building.
- Recommendations. This should include detailed recommendations regarding how the training process could be improved or changed to facilitate knowledge transfer and capacity building, as well as if there is an alternative manner than the training can take place, such as onsite training, webinar, workshop, etc.)
- Supporting documents of the training.

The completed evaluation form is received by the Project Coordinator.

4 Conclusions

This deliverable has provided an overview of the capacity building and knowledge transfer workplan for Capacity Scheme A, based on the capacity building and knowledge transfer activities that have been provided by the Strategic Partners. The goal of the workplan activities is to provide necessary skills, training and knowledge to the ECoE researchers. Through the capacity building and knowledge transfer activities, the trainees and Strategic Partners will be able to identify any gaps or additional training that will be required.

Appendix A – Capacity Building Activities: TROPOS

Selected trainings

Training/ Workshop / Webinar form

Title of Training	***Lecture: Microwave and radar remote sensing***
Introduction	*Basic and advanced knowledge about remote sensing of the atmosphere with active and passive measurement techniques working in the microwave wavelength regime.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Patric Seifert, Heike Kalesse (Uni Leipzig)*
Number of Participants	*up to 10*
Duration of Training	*2h per week*
Location of Training	*online*
Duration - dates	*Winter semester of Leipzig University (from 2022)*
Type of Training	*lecture*
Training skills required	*Basic training in geophysics, physics or meteorology*
Training equipment	*Computer with internet access and web browser*
Training objective	*The lecture will teach the most important measurement principles of active and passive remote sensing in the microwave wavelength regime to the student:* • *Introduction* • *EM waves* • *Physical laws of radiation scattering* • *Inverse methods* • *Passive remote sensing with microwaves* • *Active remote sensing with radar* • *The Doppler effect (effect, radar, dilemma)* • *Doppler spectra* • *Microphysics of the liquid phase* • *Microphysics of the ice phase, radar polarimetry I* • *Radar polarimetry II*

	• *Radar forward modeling* • *Cloud radar applications* • *Advanced Cloudnet radar products*
Outcomes	*The student is capable of assessing the capabilities of the measurement techniques presented and able to apply them to available data.*
Program **(must be attached)**	*tbd*
Activities **(must be attached)**	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training / Workshop / Webinar form

Title of Training	***Lecture: Remote sensing of wind***
Introduction	*The lecture is intended to give the participants an overview about the currently available remote-sensing techniques for measuring wind from ground and space*
Strategic Partner	TROPOS
Name of applicant	TROPOS
Name of presenter(s)	*Johannes Bühl (TROPOS)*
Number of Participants	*Up to 10*
Duration of Training	*2h*
Location of Training	*online*
Duration - dates	*tbd*
Type of Training	*Online lecture*
Training skills required	*Basic knowledge of global wind systems and their remote sensing* • *Global wind systems* • *Current ground-based and airborne wind-measuring networks* • *Remote-sensing of wind from ground* • *Current space missions for wind measurement*
Training equipment	*Computer with internet access and web browser*
Training objective	*Teaching an overview about global wind measurement*
Outcomes	*Participants have an overview about the measurement of global wind*
Program (must be attached)	*tbd*
Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***Lecture: Optical remote sensing***
Introduction	*Lecture about remote sensing with methods of the optical wavelength regime*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Albert Ansmann, Ulla Wandinger, Dietrich Althausen, … (TROPOS)*
Number of Participants	*up to 10*
Duration of Training	*2h per week*
Location of Training	*online*
Duration - dates	*Winter semester of Leipzig University (from 2022)*
Type of Training	*lecture*
Training skills required	*Basic training in meteorology, physics, geophysics or similar*
Training equipment	*Computer with internet access and web browser*
Training objective	*Teaching the basics of lidar remote sensing* • *Optical setup of a lidar* • *Signal recording* • *Raman lidar technique* • *Polarization measurement technique* • *Doppler lidar (turbulence, wind)* • *HSRL* • *Synergy with other active and passive remote-sensing measurement techniques*
Outcomes	*The student is capable of assessing the capabilities of the measurement techniques presented and able to apply them to available data.*

Program (must be attached)	*tbd*
Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – PollyXT automated Raman lidar operation***
Introduction	*The course is intended for specialists working with PollyXT Raman lidar enabling them to handle the system.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Ronny Engelmann, Holger Baars (TROPOS)*
Number of Participants	*up to 5*
Duration of Training	*2 days*
Location of Training	*On-site (either at Leipzig or Limassol)*
Duration - dates	*6 hours*
Type of Training	*Hands-on training*
Training skills required	*None*
Training equipment	*Notebook*
Training objective	*Basic training on using the PollyXT Raman lidar. Turning on and off the system, handling generated raw data. Basic understanding of system setup and cabling. Cleaning of coated optical-grade windows. Handling of the laser. Upload of data into database.*
Outcomes	*Participants are capable of running a PollyXT Raman lidar on their own.*
Program (must be attached)	*tbd*
Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – maintenance and on-site operation***
Introduction	*The training is intended for specialists working with Ground-Based Remote-Sensing Station (GBS) to learn setup of the station.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Johannes Bühl, Patric Seifert (TROPOS)*
Number of Participants	*up to 3*
Duration of Training	*1 week*
Location of Training	*On-site at Limassol*
Duration - dates	*4 hours each day*
Type of Training	*Hands-on training*
Training skills required	*Basic skills with tools*
Training equipment	*Notebook*
Training objective	*The participants of the workshop accompany the setup of the GBS radar container at Limassol. They will learn how to deploy the container at a field site, start operation of the instruments and establish data upload to relevant repositories. Maintaining, cleaning and quality checking the instruments is exercised.*
Outcomes	*Participants are capable of deploying the GBS in the field.*
Program (must be attached)	*tbd*
Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – instrument integration at Leipzig***
Introduction	*The training is intended for specialists working with Ground-Based Remote-Sensing Station (GBS) to learn about the setup of the station.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Johannes Bühl, Patric Seifert (TROPOS)*
Number of Participants	*up to 3*
Duration of Training	*2 weeks*
Location of Training	*On-site at Leipzig*
Duration - dates	*4 hours each day*
Type of Training	*Hands-on training*
Training skills required	*Basic skills with tools*
Training equipment	
Training objective	*The participants of the workshop accompany the integration of the remote sensing instruments (cloud radar, microwave radiometer, disdrometer, computer equipment etc…) into a specialized sea-container. In this way the participants learn in detail about the interior workings, functioning, electrical wiring and mechanical setup of the GBS station. At the end, packing of the container is exercised.*
Outcomes	*Participants are capable of running and maintaining the GBS radar container.*
Program (must be attached)	*tbd*

Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – Cloud radar operation***
Introduction	*The course is intended for specialists working with Ground-Based Remote-Sensing Station (GBS) enabling them to handle the cloud radar system.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Johannes Bühl, Patric Seifert (TROPOS)*
Number of Participants	*up to 5*
Duration of Training	*2 days*
Location of Training	*On-site (either at Leipzig or Limassol)*
Duration - dates	*8 hours*
Type of Training	*Hands-on training*
Training skills required	*None*
Training equipment	*Notebook*
Training objective	*Basic training on operation of the MIRA-35 cloud radar. Turning on and off the system, handling generated raw data. Basic understanding of system setup and cabling. Raw data file formats and upload of data into database.*
Outcomes	*Participants are capable of running a MIRA-35 cloud radar on their own.*
Program (must be attached)	*tbd*
Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – Setup and usage of Cloudnet software***
Introduction	*The course is intended to teach specialists working with the Ground-Based Remote-Sensing Station (GBS) of ECoE how to create a ACTRIS-Cloudnet dataset.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Johannes Bühl, Patric Seifert (TROPOS)*
Number of Participants	*up to 5*
Duration of Training	*2 days*
Location of Training	*Online or in-person*
Duration - dates	*6 hours each day*
Type of Training	*workshop*
Training skills required	*Programming skills in Python 3*
Training equipment	*Computer with internet access*
Training objective	*Introduction to the structure and internal procedures of the ACTRIS-Cloudnet standard processing algorithm (CloudnetPy). Contents of the course are instrument requirements, data input, data preprocessing, product generation, data upload and quality control.*
Outcomes	*Participants are capable of running the CloudnetPy algorithm, create data products and upload them to the central ACTRIS-Cloudnet database.*
Program (must be attached)	*tbd*

Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – PollyXT automated Raman lidar evaluation***
Introduction	*The course is intended for specialists working with PollyXT Raman lidar data enabling them to handle, evaluate and use of its data.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Holger Baars (TROPOS)*
Number of Participants	*up to 5*
Duration of Training	*3 days*
Location of Training	*online*
Duration - dates	*3 hours each day*
Type of Training	*workshop*
Training skills required	*Basic computer and programming skills under windows*
Training equipment	*Computer with internet access*
Training objective	*Basic training on evaluation of PollyXT Raman lidar data. Generation of profiles of multi-wavelength aerosol extinction coefficient, depolarization ratio and angstrom exponent. Ability to disambiguate between ice, drizzle and aerosol particles. Knowledge about presenting data and scientific usage.*
Outcomes	*Participants are capable of evaluating PollyXT Raman lidar profiles with the specialized PollyXT Raman lidar analysis software in order to produce publication-grade results.*
Program (must be attached)	*tbd*
Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***GBS – data evaluation workshop***
Introduction	*The course is intended for students and scientists working with the Ground-Based Remote-Sensing Station (GBS) of the ECoE. It will teach handling of data from the complete station in a synergetic way.*
Strategic Partner	*TROPOS*
Name of applicant	*TROPOS*
Name of presenter(s)	*Johannes Bühl, Martin Radenz (TROPOS)*
Number of Participants	*up to 5*
Duration of Training	*2 days*
Location of Training	*Online or in-person*
Duration - dates	*6 hours each day*
Type of Training	*workshop*
Training skills required	*Basic computer and programming skills under windows with Python 3*
Training equipment	*Computer with internet access*
Training objective	*The GBS provides a variety of data products that can be used in a synergetic way to understand complex processes in the atmosphere. The goal of the workshop is to enable the participants to learn basic workflows in order to process pre-processed data from the Cloudnet, PollyNET and Doppler-Lidar suite of algorithms.*
Outcomes	*Participants are capable of presenting and analyzing data from the GBS in a publication-ready form.*
Program (must be attached)	*tbd*

Activities (must be attached)	*tbd*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Appendix B – Capacity Building Activities: DLR

Selected trainings

Training / Workshop / Webinar form

Title of Training	**Automatic Processing Chain CATENA**
Introduction	Basic training on optical data processing to ECoE students or researchers members based on the DLR processing chain CATENA.
Strategic Partner	DLR
Name of applicant	
Name of presenter(s)	Thomas Krauß
Number of Participants	4-12
Duration of Training	2 consecutive days, each 9:00-12:00
Location of Training	Online
Duration - dates	
Type of Training	Webinar/Workshop
Training skills required	• Basic knowledge of Satellite Remote Sensing • Basic knowledge of UNIX/Linux
Training equipment	• CATENA infrastructure for use in hands-on-experiment, 5 UNIX/Linux machines able to run Docker Containers, 16 GB RAM, 1 TB free disk space • For each participant: Web- and remote-shell-access to this infrastructure (best from a Linux machine)
Training objective	• Acquisition and Metadata of Satellite Imagery • Processing of Satellite Imagery • Structure of CATENA • Processing Chains • Step-by-step: Orthorectification • Hands-on: Processing of satellite scenes
Outcomes	• Participants should understand the principles of an automatic cloud processing system for remote sensing data • Participants should be able to process scenes on their own using the CATENA infrastructure
Program **(must be attached)**	Day 1: Introduction and Theory • Acquisition and Metadata of Satellite Imagery • Processing of Satellite Imagery • Structure of CATENA • Processing Chains

	• Supported Satellite data • Step-by-step: Orthorectification Day 2: Hands-on Workshop • Preparation of satellite scenes • Ingestion of scenes • Processing • Error handling • Results
Activities **(must be attached)**	

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	***Basics of maritime information extraction from Synthetic Aperture Radar (SAR)***
Introduction	*The transferred knowledge will involve fundamentals of methods and algorithms used to derive maritime information such as sea state, ocean surface wind, ship detection and classification, ice and oil detection from SAR data*
Strategic Partner	DLR
Name of applicant	DLR
Name of presenter(s)	*Sven Jacobsen*
Number of Participants	*5*
Duration of Training	*3h*
Location of Training	*online*
Duration - dates	*13.10.2021, 10:00 to 13:00 CEST*
Type of Training	*webinar*
Training skills required	*Basic knowledge in informatics and system engineering as well as maritime remote sensing and/or oceanography is an asset to understand the procedures introduced.*
Training equipment	*Computer with internet access and web browser*
Training objective	*Teaching of basics for maritime information extraction from Synthetic Aperture Radar (SAR)*
Outcomes	*Participant are prepared for the hands-on onsite trainings on DLR's software for maritime information extractions and understand the fundamentals of the applied algorithms.*
Program **(must be attached)**	*10:00h: object detection* *11:00h: wind & sea state*

	12:00h: ice & oil *13:00h: Closing*
Activities **(must be attached)**	*n.a.*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Appendix C – Capacity Building Activities: NOA

Selected trainings

Training/ Workshop / Webinar form

Title of Training	**Seminar on crop classification using Sentinel data for the monitoring of the CAP**
Introduction	This knowledge transfer activity will benefit ECoE members to enhance their knowledge on artificial intelligence for earth observation for agricultural applications. The activity will offer the background, context and motivation behind the aforementioned domain, but also the technologies and models used (state-of-the–art, the beyond state-of-the-art). Finally, it will highlight the research capabilities of ECoE, assist in the demonstration scenarios later on, promote ideas creation, sharing, evaluation and dissemination. The exiting knowledge of ECoE members is about Remote sensing and Field Spectroscopy. The capacity needs that have been identified in the sector are: • Artificial Intelligence: Machine-Learning data driven modelling of EO/in-situ/meteorological data. Data/Image processing/analysis • Automated big data pre-processing, curation & management: Data bases including EO/in-situ/meteorological data, etc. • Server management & administration: Big EO data management The content of the activity will be: • Introduction, context and motivation – crop classification for CAP monitoring – how does ECoE fit? • Introduction to supervised and unsupervised learning • Automated and efficient acquisition of Satellite Imagery & Data pre-processing (Sentinels) • Databases and data querying (PostGIS) • Introduction to Data Cube technologies • Data combination/fusion S1 & S2 data, • Auxiliary data for crop classification • Supervised crop classification algorithms • Smart sampling of on the spot checks for CAP monitoring
Strategic Partner	NOA

Name of applicant	ECoE
Name of presenter(s)	**Vassilis Sitokonstantinou** Vassilis received his BEng in Electrical and Electronic Engineering from Imperial College London, in 2013. The following year he graduated from University College London (UCL) with an MSc in Wireless and Optical Communications. In 2017 he received his second MSc title in Space Science, Technology and Applications from the University of Peloponnese, in collaboration with the National Observatory of Athens. He currently works as a research associate in the Institute of Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens, while focusing on Agriculture Monitoring using Big Earth Observation data. He leads a team of big data and artificial intelligence scientist in the domain of AI4EO conducting impactful research and developing novel applications in the thematic areas of smart farming, food security and agricultural policy monitoring. Finally, he is a PhD candidate at the National Technical University of Athens on Big Earth Observations and Artificial Intelligence for applications in Agriculture. **Thanassis Drivas** Thanassis Drivas received his BSc in Computer Science from Athens University of Economics and Business in 2007. In 2017 he received his MSc title in Space Science, Technology and Applications from the University of Peloponnese, in collaboration with the National Observatory of Athens. He has long professional experience in teaching Computer Science and Programming, STEM and Robotics in private schools and colleges. At the same time he has worked as web and back end developer in several companies like SaraLee Hellas. From 2017 he is a research associate in the IAASARS of the National Observatory of Athens, focusing on the design-development of geospatial applications using Machine learning techniques and Earth Observation Big Data.
Number of Participants	ECoE members interested in agricultural monitoring
Duration of Training	4 consecutive days, each 10:00 – 14:00 CEST, 16 hours in total
Location of Training	Online
Duration - dates	
Type of Training	Remote Training Workshop
Training skills required	For the first half of day 1, trainees should have the following capabilities as minimum requirement to follow the workshop: • interest in EO-based agriculture monitoring

	• background in remote sensing is a must • data analytics skills are optional For the day 2 till day 4, trainees should have the following capabilities as minimum requirement to follow the workshop: • interest in agricultural monitoring • background in remote sensing is a must • data analytics skills • background in machine learning • basic knowledge of a scripting language (optional)

Training equipment	Equipment that trainers and trainees will need for the training is:
	
	• Laptops/PC with microphones
	• Internet connection
	• Access to Zoom webinars
	Regarding hands-on exercises, EcoE will need to have:
	
	• Access to sentinel images through FTP software
	• Python 3.6 (recommended version)
	• Important Libraries (Either installed by pip or via conda package)
	  ○ GDAL
	  ○ Rasterio
	  ○ Shapely
	  ○ NumPy
	  ○ MatplotLib
	  ○ Scikit Learn
	• QGIS
	• SNAP (Esa software for Sentinel-1)
	• SNAPPY (Python Library for connecting to SNAP)
	• Jupyter notebooks
	Hardware
	
	• At least 16GB RAM
	• Several GBs for storing raw and generated images OS
	• Ubuntu 18+ (Recommended)
	Important Note
	
	• Raw data will be transferred via FTP. However, as a proof of concept one more products will be download at the time of the workshop. In addition, participants will be given access to several Jupyter notebooks so to parameterize the existing code.

Training objective	Introduction, context and motivation for agriculture & CAP monitoring
Outcomes	• Acquisition of Satellite Imagery & Data pre-processing • Understanding of the Databases and data querying • Introduction to Data Cube • Basic understanding on S1 & S2 Data fusion

	• Explanation of the crop classification & Smart sampling technologies
Program	The program below needs to be confirmed and discussed within the Working Group. **Day 1:** 10:00 – 10:45 Introduction, context and motivation – crop classification for CAP monitoring – how does ECoE fit? 11:00 – 11:45 Introduction to supervised and unsupervised learning 12.00 – 14.00 Hands on examples on supervised and unsupervised classification algorithms using python or MATLAB. **Day 2:** 10:00 – 10:30 Automated and efficient acquisition of Satellite Imagery & Data pre-processing (Sentinels) 10:30 – 11:15 Databases and data querying (PostGIS) 11:15 – 12:00 Introduction to Data Cube technologies 12.00 – 14.00 Hands on training on how to automatically acquire Sentinel data, populate the database in query from the database **Day 3:** 10:00 – 10:20 Introduction on crop classification 10:20 – 10:50 Data combination/fusion S1 & S2 data, 10:50 – 11:15 Auxiliary data for crop classification 11:15 – 11:45 Supervised crop classification algorithms (1) 12.00 – 14.00 Hands on training on how to implement a supervised crop classification algorithm (data preparation and model building in python) **Day 4:** 10:00 – 11:00 Supervised crop classification algorithms (2) – The Cyprus example 11:00 – 11:45 Smart sampling of on the spot checks for CAP monitoring

	12.00 – 13.00 Hands on training on how to implement a supervised crop classification algorithm (model fine-tuning and results interpretation) 13:00 – 14:00 Open discussion, Q&A, How does ECoE fit
Activities	The aforementioned program is comprised by presentations and live demonstrations by the instructors.

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	**Remote training in the disaster management sector offered from NOA**
Introduction	This knowledge transfer activity will benefit ECoE members to increase the efficiency and productivity of the sector. It will highlight the research capabilities of ECoE, assist in the demonstration scenarios later on, promote ideas creation, sharing, evaluation and dissemination. The exiting knowledge of ECoE members is: • SAR basics • Differential SAR Interferometry (DInSAR) • Coherence based products on earthquake/landslide impact assessment and monitoring. • Earthquakes/ Landslides Risk Assessment. • GNSS campaigns and processing for validation of SAR based products. • Geotechnical Engineering (natural or mane made slopes, earth or rock slopes, surface or deep foundations, earth retaining structures, soil erosion): Analytical and numerical modelling in geotechnical engineering. • Analytical and numerical probabilistic analysis of geotechnical engineering problems based on the theory of random fields. • Reliability of geotechnical engineering structures with respect of field investigation. • Landslide risk assessment (hazard -probability, vulnerability, elements at risk). • Investigation of rockfall measures adequacy and cost-effectiveness. • Soil erosion risk assessment (hazard -probability, vulnerability, elements at risk). The capacity needs that have been identified in the sector are: • Persistent Scatterer Interferometry (PSI). • Small Baseline Interferometric SAR (SBAS). • Other advanced SAR processing techniques. • Training on Ground-based SAR and relative applications. • Atmospheric corrections through relevant models for SAR measurements. • Processing chains for the exploitation of magnetometer data (satellite and ground-based) and the use of relevant software.

	• Ground/Geology/Geomorphology modelling through geophysical processes / Geophysical measurements and micro-zonation. • Use of electromagnetic emissions as potential pre-seismic indicators (satellite and ground-based data, earthquake studies, pre-seismic EM emissions, etc.). • Integration of crowdsourcing techniques. • Use of Big Earth Data in the monitoring of earthquakes and landslides. • Machine Learning / Artificial Intelligence and automation of processes (e.g. Google Earth Engine, scripts, etc.). The content of the activity will be: • Overall approach from risk assessment to mitigation measures (hazard, exposure, susceptibility, vulnerability) • Techniques for damage assessment using EO data (optical, SAR) in support to damage assessment, trends of damage behavior and dynamic assessment etc. • Analysis of Copernicus data • Applications/examples
Strategic Partner	NOA
Name of applicant	ECoE
Name of presenter(s)	**Alexia Tsouni** *Alexia Tsouni received her diploma in Civil Engineering (2001) from the School of Civil Engineering of the National Technical University of Athens (NTUA), which is equivalent to Master of Engineering, with specialization in Water Resources, Hydraulic and Maritime Engineering. She also holds a M.Sc. in Water Resources Science and Technology (2003) from the School of Civil Engineering of NTUA. She has a long-term experience as a water engineer in the private sector working as a consultant for public and private projects in Greece and abroad (2001-2013). Moreover she has worked on climate forecasting models for improving forecasting of atmospheric and climatic parameters in regional and local scale in the Eastern Mediterranean region in the Institute of Environmental Research and Sustainable Development at NOA (2002-2003), and in the Laboratory of Hydrology and Water Resources Management at NTUA for EUROHARP and HARMONIQUA projects (2003). Since 2006 and up to now she has been working on Earth Observation research and operational projects in the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing at NOA: MARISS/ESA/GSE, LIMES/EC/GMES, RISK-EOS/ESA/GSE, SAFER/EC/GMES, SMURBS/EC/H2020, MARINE-EO/EC/H2020, GEO-CRADLE/EC/H2020, LDA/EC, BEYOND/EC/FP7 and Copernicus EMS/EC. Her main responsibilities and research interests focus on remote sensing applications.*

	Haris Kontoes *Dr Kontoes holds the position of Research Director in the Institute for Astronomy and Astrophysics Space Applications and Remote Sensing of the National Observatory of Athens (NOA/IAASARS). He received his Doctorate in Remote Sensing of the Environment (NTUA, 1992). He completed his doctoral studies holding a grant from the European Commission in the Institute for Space Applications of the Joint Research Centre at ISPRA (Environmental Mapping Group, JRC). Since 1992 he has been assuming responsibilities in managing Earth Observation operational & research projects, focusing on risk assessment and mitigation, risk monitoring and management, environmental resource management, and mapping in various contexts and scales. He leads BEYOND Center of Excellence (www.beyond-eocenter.eu) and a highly skilled research team with active participation in Space related projects funded by ESA, EC Framework Programs, H2020, COPERNICUS, and GEO. The Center's activity focuses on Emergency Response (during crisis) and Emergency Support (preparedness and recovery) (according to the Copernicus EMS standards), the protection of Sea and Atmospheric environment, as well as advanced topics relating to Agriculture and Food Security, improved Access to Renewable Energy Resources, and Climate Resilience and Adaptation to Climate Change.*
Number of Participants	ECoE members interested in disaster risk reduction and risk assessment:
Duration of Training	2 consecutive days, 2 hours/day, 4 hours in total
Location of Training	Online
Duration - dates	
Type of Training	Remote Training Workshop
Training skills required	Trainees should have the following capabilities as minimum requirement to follow the workshop: • interest in disaster risk reduction • background in remote sensing • interested in Satellite Remote Sensing processing, • basic knowledge of GIS
Training equipment	Equipment that trainers and trainees will need for the training is: • Laptops/PC with microphones • Internet connection • Access to Zoom webinars • GIS software

Training objective	• Basic understanding of spatial data and its analysis • Develop spatial problem-solving abilities • Understand the importance of disaster risk management • Mitigation measures
Outcomes	• Develop an understanding of spatial data and its analysis • Develop spatial problem-solving abilities and practical skills in GIS analysis and cartography • Explore a broad set of applications of spatial data and GIS for crisis management and disaster risk reduction • Critically reflect on the power, usefulness, and limitations of GIS and spatial data broadly and in disaster management
Program	The program below needs to be confirmed and discussed within the Working Group. Day 1 – 10:00-12:00: Fundamentals/Theory of Risk assessment: • Basics • Types of spatial data • Spatial analysis for assessing hazard risk and vulnerability • Risk, Vulnerability and Resilience • Disaster Preparedness • Mitigation measures Day 2 – 10:00-12:00: Applications • Current and potential applications of spatial data and GIS in disaster management • Range of analyses on both vector and raster datasets • Examples on Applications including earthquakes, landslides, volcanic risk assessment etc. • Open discussion, Q&A, How does ECoE fit
Activities	The aforementioned program is comprised by presentations and live demonstrations by the instructors.

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Training/ Workshop / Webinar form

Title of Training	**Earthquakes/Landslides: Training on data processing to ECoE based e.g. on the NOA's workflow for GEObservatory.**
Introduction	This knowledge transfer activity will benefit ECoE members to increase the efficiency and productivity of the sector. It will highlight the research capabilities of ECoE, assist in the demonstration scenarios later on, promote ideas creation, sharing, evaluation and dissemination. The existing knowledge of ECoE members is: • SAR basics • Differential SAR Interferometry (DInSAR) • Coherence based products on earthquake/landslide impact assessment and monitoring. • Earthquakes/ Landslides Risk Assessment. • GNSS campaigns and processing for validation of SAR based products. • Geotechnical Engineering (natural or mane made slopes, earth or rock slopes, surface or deep foundations, earth retaining structures, soil erosion): Analytical and numerical modelling in geotechnical engineering. • Analytical and numerical probabilistic analysis of geotechnical engineering problems based on the theory of random fields. • Reliability of geotechnical engineering structures with respect of field investigation. • Landslide risk assessment (hazard -probability, vulnerability, elements at risk). • Investigation of rockfall measures adequacy and cost-effectiveness. • Soil erosion risk assessment (hazard -probability, vulnerability, elements at risk). The capacity needs that have been identified in the sector are: • Persistent Scatterer Interferometry (PSI). • Small Baseline Interferometric SAR (SBAS). • Other advanced SAR processing techniques. • Training on Ground-based SAR and relative applications. • Atmospheric corrections through relevant models for SAR measurements.

	• Processing chains for the exploitation of magnetometer data (satellite and ground-based) and the use of relevant software. • Ground/Geology/Geomorphology modelling through geophysical processes / Geophysical measurements and micro-zonation. • Use of electromagnetic emissions as potential pre-seismic indicators (satellite and ground-based data, earthquake studies, pre-seismic EM emissions, etc.). • Integration of crowdsourcing techniques. • Use of Big Earth Data in the monitoring of earthquakes and landslides. • Machine Learning / Artificial Intelligence and automation of processes (e.g. Google Earth Engine, scripts, etc.). The content of the activity will be: • Processing of Imagery, • Time series analysis: Persistent Scatter Interferometry methods for geo-hazards monitoring, • Time series analysis: Small Baseline Interferometric SAR (SBAS). • Applications including earthquakes, landslides, volcanic activity, construction activity, etc.
Strategic Partner	NOA
Name of applicant	ECoE
Name of presenter(s)	**Stavroula Alatza** *Stavroula Alatza holds a degree in Surveying Engineering from National Technical University of Athens (NTUA). She also holds a PhD on SAR interferometry for monitoring Earth deformation, in School of Rural and Surveying Engineering of NTUA. Since 2014 she is an active member of Higher Geodesy Laboratory and Dionysos Satellite Observatory of NTUA. She has participated in research activities of Dionysos Satellite Observatory, focusing on GNSS-InSAR data processing and time series analysis to monitor ground deformation in South Aegean region, as well as educational activities of Higher Geodesy Laboratory, in Satellite Geodesy and applications of Higher and Satellite Geodesy.* **Alexis Apostolakis** *Alexis Apostolakis got his diploma from Electrical Engineer and Computer Engineer faculty at the National Technical University of Athens (NTUA) in 1993. His diploma thesis was in the sector of Reinforcement Learning with Neural Networks.*

	He has an MSc (2016) in Space Science, Technologies and Applications by University of Peloponnese (UoP) and the National Observatory of Athens (NOA). From 2017 he is working as a research partner in the fields of data science and software systems development with the Beyond team of IAASARS at the National Observatory of Athens. He has long professional experience in software development and Information Technology in general, from different job positions and entrepreneurship. He started as a freelancer in 1991 developing applications for Topography and Road Design studies. He has worked at large companies like at the Greek mobile Operator COSMOTE (Greece) as an IT section manager and project manager (2002-2013) and at Athens metro development company ATTIKO METRO (1997 – 2001) as a software engineer. From 2011 he is an associate at Technocontrol, a company that provides Industrial automation solutions. *During his occupation at the "Beyond" Team of NOA he has implemented processing chains for the detection of land deformation using and customizing related open source software for INSAR and he is currently working on a predictive wildfire modeling using ML.* **Constantinos Loupasakis** *Mr. Loupasakis Konstantinos serves as an Associate Professor in the Department of Geological Sciences, School of Mining Engineering - Metallurgy of the NTUA, with the subject "Technical Geology and Geotechnical Methods of Improving Geological Formations". He holds two basic degrees, Geologist (1995) and Civil Engineer (2001), as well as two postgraduate degrees, a Master's Degree in Applied and Environmental Geology (1998) and a Doctorate Diploma in Engineering Geology (2002). His research interests concern geotechnical engineering with emphasis on technical geology, soil engineering - rock engineering, computational geotechnical engineering, geotechnical methods of improving geological formations and the investigation-containment of natural and man-made catastrophic phenomena.* **Haris Kontoes** *Dr Kontoes holds the position of Research Director in the Institute for Astronomy and Astrophysics Space Applications and Remote Sensing of the National Observatory of Athens (NOA/IAASARS). He received his Doctorate in Remote Sensing*

	of the Environment (NTUA, 1992). He completed his doctoral studies holding a grant from the European Commission in the Institute for Space Applications of the Joint Research Centre at ISPRA (Environmental Mapping Group, JRC). Since 1992 he has been assuming responsibilities in managing Earth Observation operational & research projects, focusing on risk assessment and mitigation, risk monitoring and management, environmental resource management, and mapping in various contexts and scales. He leads BEYOND Center of Excellence (www.beyond-eocenter.eu) and a highly skilled research team with active participation in Space related projects funded by ESA, EC Framework Programs, H2020, COPERNICUS, and GEO. The Center's activity focuses on Emergency Response (during crisis) and Emergency Support (preparedness and recovery) (according to the Copernicus EMS standards), the protection of Sea and Atmospheric environment, as well as advanced topics relating to Agriculture and Food Security, improved Access to Renewable Energy Resources, and Climate Resilience and Adaptation to Climate Change.
Number of Participants	ECoE members interested in disaster risk reduction and SAR:
Duration of Training	4 days, 2 hours/day, 8 hours in total
Location of Training	Online
Duration - dates	
Type of Training	Remote Training Workshop
Training skills required	Trainees should have the following capabilities as minimum requirement to follow the workshop: • interest in disaster risk reduction • background in remote sensing is a must • interest in InSAR processing tools and algorithms • basic knowledge of UNIX/Linux
Training equipment	Equipment that trainers and trainees will need for the training is: • Laptops/PC with microphones • Internet connection • Access to Zoom webinars Regarding hands-on exercises, EcoE will need to have: • ISCE installed (https://github.com/isce-framework/isce2)

	• StaMPS installed (https://github.com/dbekaert/StaMPS) • MATLAB • P-PSI (https://github.com/AlexApostolakis/P-PSI) • Access to Sentinel-1 images (python script with specific datasets will be provided for downloading) / already downloaded in VM Computing/hardware needs: • Type: Linux • CPU: 10 Cores/20 Threads (minimum 6 cores/12 threads) • RAM: 128 GB (minimum 64GB) • Internal (fast) Storage: 4TB • Software: InSAR open-source software, ISCE, StaMPS, MATLAB, P-PSI processing software Alternatively: connect to NOA's servers
Training objective	Basic experience in SAR interferometry processing methods and time-series analysis.
Outcomes	Get hands on experience in InSAR processing techniques, Big Data, Time series analysis and Applications.
Program	The program below needs to be confirmed and discussed within the Working Group. **Day 1**: 10:00-12.00: InSAR processing techniques Hands on training on InSAR processing with ISCE software / Introduction to stack processing of TOPS data for time-series analysis with ISCE software. **Day 2**: 10:00-12.00: Time series analysis 1 Hands on training on time-series analysis with ISCE software / Parallel PSI architecture and performance improvement. **Day 3** 10:00-12.00: Time series analysis 2 Hands on training on Persistent Scatter Interferometry methods for geo-hazards monitoring / Implementation of Small Baseline subset (SBAS) technique to S-1 TOPS stack.

	Day 4 10:00-12.00: Application Hands on training on one application to be decided from the Working Group (earthquake, landslide, volcano etc.) Suggestion: overexploitation of underground water in Western Thessaly plain. Open discussion, Q&A, How does ECoE fit
Activities	The aforementioned program is comprised by presentations and live demonstrations by the instructors.

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Appendix D – Training/ Workshop / Webinar Forms

Training/ Workshop / Webinar form

This form is essential in order get authorization to proceed with trainings during the EXCELSIOR project. Understanding the critical elements of successful knowledge transfer process is vital to the success of capacity building. It is very importance that the information of each area is identified in order to present the appropriate skills, risk mitigation and secure the overall success of the training/workshops.

Title of Training	*(What is the title of the training)*
Introduction	*The introduction should include the answers to the following questions:* *1. Why is knowledge transfer required?* *2. What type of knowledge will be transferred?* *3. What is the trainee's existing level of knowledge/expertise?*
Strategic Partner	*(Which Strategic Partner will be hosting the training)*
Name of presenter(s)	*(Who will be presenting the training)*
Number of Participants	*(The minimum participants should be five)*
Duration of Training	*(How long will the training last)*
Location of Training	*(Where will the training be located, if applicable)*
Duration - dates	*(The dates that the training will begin and end)*
Type of Training	*(Indicate the type of training, such as onsite training, webinar, workshop, etc.)*
Training skills required	*(Indicate minimum requirements and capabilities of the trainees that are necessary for the training)*
Training equipment	*(Indicate what equipment or infrastructure is necessary for the training)*
Training objective	*(Clearly define the primary objective of the training)*

Outcomes	*(Provide a detailed explanation of the anticipated outcomes of the training)*
Program **(must be attached)**	*(Provide a copy of the daily program for on-site training. For webinars or workshops, provide a copy of the training agenda)*
Activities **(must be attached)**	*(Provide a list of activities by day for on-site training. For workshops, include the hands-on activities conducted.)*

The final approval is required by the ECoE and/or the EXCELSIOR Strategic Partner committee

Authorized by:

Project Manager **Project Coordinator**

Training/ Workshop / Webinar Trainer Verification form

This report is to be completed by the trainer following the trainings.

Title of Training	*(What is the title of the training)*
Strategic Partner	*(Which Strategic Partner hosted the training)*
Name of presenter(s)	*(Who presented the training, provide a list of trainers/presenters)*
Number and names of Participants	*(Number and names of participants; attach list if necessary)*
Duration of Training	*(How long did the training last)*
Location of Training	*(Where was the training conducted, if applicable)*
Duration - dates	*(The dates that the training began and ended)*
Type of Training	*(Indicate the type of training, such as onsite training, webinar, workshop, etc.)*
Documentation **(must be attached)**	*(Provide documentation of attendance of the training.* *1. For on-site training, provide a timesheet or similar documentation from the Strategic Partner.* *2. For webinars, provide a video of the webinar and a copy of the power point presentation.* *3. For workshops, provide documentation of attendance)*
Actions resulting from Trainings **(must be attached)**	*(Provide a detailed report regarding the actions resulting from the trainings, such as practical skills developed during training that are transferable to the ECoE)*
Deliverables resulting from Trainings **(must be attached)**	*(Provide all reports, presentations, journal articles, conference proceedings, trainings, etc. that have resulted from the training)*

Evaluation of training	*(The Strategic Partner will provide an evaluation of the secondee, their activities and their abilities as indicated through the training)*
Recommendations	*(Provide detailed recommendations regarding how the training process could be improved or changed to facilitate knowledge transfer and capacity building. Include if there should be an alternative manner than the training can take place, such as onsite training, webinar, workshop, etc.)*
Supporting documents	*(Please provide supporting documentation, such as airline tickets, accommodation, etc., if applicable)*

Authorized by:

Project Manager **Project Coordinator**

Training/ Workshop / Webinar Trainee Evaluation form

This report is to be completed by the trainee following the trainings.

Title of Training	*(What is the title of the training)*
Duration - dates	*(The dates that the training will begin and end)*
Type of Training	*(Indicate the type of training, such as onsite training, webinar, workshop, etc.)*
Evaluation of capacity building	*(Provide an evaluation of the skills learned during the training, as to provide documentation of the knowledge transfer and capacity building that took place during the training)* **Level of training:** ☐ **Advanced** ☐ **Intermediate** ☐ **Basic** **The training advanced my skills** ☐ **Yes, I learned new skills** ☐ **The training had no effect on my skills** ☐ **The training was a refresher of existing knowledge** **The skills learn will assist me in my job duties** ☐ **Yes, the training will aid in advancing my skill level** ☐ **No, I didn't benefit from the skills learned in the training** ☐ **Somewhat, I learned new skills but not enough.** **The type of training was satisfactory (online, in person, workshop, etc.)** ☐ **The type of training for the topic was satisfactory** ☐ **The training would be more effective if it took place in a different way. Please provide suggested type of training:** **The training material provided was satisfactory** ☐ **Yes, it was satisfactory** ☐ **No, more effective material could be provided** ☐ **Additional material would be more beneficial** **The trainer was knowledgeable and effective** ☐ **Yes, the trainer was able to provide effective knowledge transfer**

	☐ **No, the trainer did not provide the necessary knowledge transfer** ☐ **The trainer was knowledgeable but not effective in training**
Actions resulting from Trainings	*(Provide information regarding the practical skills developed during training that are transferable to the ECoE)* **The training provided will help me to advance my research area** ☐ **Yes, the training will help me advance my research area** ☐ **No, the training did not provide any additional help** ☐ **The training provided some information, but not enough** **The training provided me with new skills that will help me write more effective research proposals** ☐ **Yes, the training provided information that will be helpful in writing more effective research proposals** ☐ **No, the training did not provide any additional help** ☐ **The training provided some skills, but not enough** **The training will aid in developing excellence in ECoE research capability** ☐ **Yes, the training will greatly assist in developing excellence** ☐ **No, the training is basic and has no value in developing excellence** ☐ **The training was useful but not at the level necessary to achieve excellence**
Future trainings required	*(The secondee should indicate what further training is necessary for successful knowledge-transfer and capacity building)* **Future training is necessary** ☐ **Yes, more training is required in this topic** ☐ **No, the training covered all necessary information needed** ☐ **The training was useful but not enough**
Recommendations	*(Provide detailed recommendations regarding how the training process could be improved or changed to facilitate knowledge transfer and capacity building. Include if there should be an alternative manner than the training can take place, such as onsite training, webinar, workshop, etc.)*

Received:

Project Coordinator **Date**