

# EARTH OBSERVATION EDUCATION AND TRAINING ACTIVITIES IN ESTONIA: QUO VADIS?



MobileMonday: Space Edition vol 2

SPARK Demo | 27. Jan. 2020

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# UNIVERSITY OF TARTU

Masters level courses in Dept. of Geography

- Applied Remote Sensing for MSc GIS (4 EAP)
  - 1 EAP ca 15h lecture+lab session+homeworks+assignments)
  - Krista Alikas, Tartu Observatory
- extended to 6 EAP
- will also be available in the new ATI Data Science curriculum, Sept. 2020

additional courses (Krista Alikas, Mait Lang, Tartu Observatory):

- Environmental Remote Sensing I and II

topics incl. passive/active RS, sensors, vegetation & water RS, change detection.

- practicals
  - SNAP to process Sentinel data
  - Google Earth Engine for longer time series, larger better spatial coverage and use other satellites.

- Specific EO satellites course (Prof Tõnu Oja, but will be superseded by Krista Alikas' courses)

the course was meant to provide additional (to basic RS course by Urmas Peterson) knowledge about EO, included practical work with MODIS files

- Methods and Research Directions in Geography: introduction in MSc Estonian

what is RS/EO, geoinfo etc, what can you do, specialisations

- Geoinformatics introduction BSc Estonian (EO as data sources)

- Spatial Data Studio (Evelyn Uuemaa, Bruno Montibeller, myself)

has some applied lectures and exercises on e.g. land use classification and NDVI, awareness of different constellations/sensors/products

- Geospatial Analysis with Python and R (myself, Anto Aasa)

lectures also introduce to work with raster data, not EO/RS in specific

# UNIVERSITY OF TARTU

selected research topics with RS/EO



## Department of Geography

- Greenhouse gases, temperature and water-related (e.g. wetlands, soil moisture)
- crop monitoring with RS (Sentinel 1 and 2), crop detection
- Landuse / land cover, change detection, urban sprawl, forest cover
- urban micro heat islands
- Research related to prevention and suppression of wildfires (including based on EO/RS data)

## Laboratory of Atmospheric Physics (Department of Bio- and Environmental Physics)

- PhD topics are weather/climate/aerosol related

Tartu Observatory: more extensive

# KAUGSEIRE.EE

(<https://kaugseire.ee/>)

Liisi Jakobson, Tartu Observatory



## tulemast Eesti kaugseire kodulehele!

ad eestikeelset informatsiooni kaugseire ja selle rakenduste kohta.

on jaotatud järgmiselt:

**Kaugseire.** Räägitakse üldisemalt, mis on kaugseire, milleks seda kasutatakse ning millisteks peamisteks valdkondadeks see jaguneb.

**Copernicus.** Tutvustab Euroopa suurprojekti, mille raames kogutakse ning jagatakse keskkonna andmeid Maa jälgimise satelliitidelt ning *in situ* sensoritelt – mõõtmisel õhust, merelt ja maalt.

**Projektid.** Annab ülevaate paari viimase aasta kaugseire projektide kohta, loetelu ei ole lõplik.

**Infomaterjalid.** Koondab endas eestikeelseid kaugseirealaseid infomaterjale: artiklikogumikud, õppevideod, ettekanded ja palju muud.

**Kalender.** Sisaldab infot kaugseiret puudutavate sündmuste kohta.

← jaanuar 2020

E	T	K	N	R	L
		1	2	3	4
6	7	8	9	10	11
13	14	15	16	17	18
20	21	22	23	24	25
27	28	29	30	31	

## Plaanis RITA KAUGSEIRE raames

► Seminar „Kaugseire meie kõigile teenistuses“ 24.01.2020

► Seminar droonide kasutusvõimalustest ehitussektoris 16.12.2019

► Veetaseme seire kasutajaseminar

► Maastikutulekahju tõrjumise prototüübi esitlus

► Kasutajaseminar PRIAga põllukultuuride määramisest

- opening page lists institutions and enterprises that are related to RS.
- Section "Kaugseire" - a small introductions about RS of vegetation, RS of water bodies, RS of atmosphere, and radar monitoring.
- Section "Copernicus"

- Section "Projects/Projektid" - larger project of last few years.

The latest big project is RITA KAUGSEIRE, with 9 different partners from University of Tartu, TalTech, Estonian University of Life Sciences, KappaZeta, a private company is involved.

"Use of Remote Sensing data for the public services in Estonia"

4 working packages: fire, water, field and homes.

During the project we concentrate also to education.  
From 15 to 20 September 2019 there was an Advanced  
Training School on RS  
(<https://www.baltic.earth/voru2019/>).

Several other information and training events are  
organized and will be organized to introduce the  
results of the project as well to increase the awareness  
among public administration and students about  
Copernicus program remote sensing methods.

- Section "Infomaterjalid" - Different material about RS.

There is no place in Estonia one could learn RS specialty. Specialists who are working in RS field have been generally graduated in physics, environmental technology, geography, biology etc and have taken different RS courses that are available in Tartu University, TalTech and Estonian University of Life Sciences. Most of these courses are for MSc level.

You can see all courses in Estonia that we (Liisi Jakobson, TO) are aware of.



Section "Infomaterjalid/meediale" - pictures for journalists which they can use when they are writing about RS.

And Section "Calendar" – we try to gather information about events in Estonia that are connected with RS.  
New information is always welcome!

# **HACKATHONS AND PROFESSIONAL ACTIVITIES**

## Garage 48 with various partners and jointly funded projects

- Copernicus OceanHack (Nov 2019, Tallinn, Estonia)
- SpaceTech Bootcamp (May 2019, Tartu, Estonia)
- Garage48 SpaceTech 2019 (May 2019, Tartu, Estonia)
- SpaceTech Riga Challenge (May 2018, Riga, Latvia)
- SpaceTech: Integrated applications (Nov 2017, Tartu, Estonia)
- SpaceTech 2016 (May 2016, Tartu, Estonia)

Department of Geography, with Tartu Observatory and  
Institute of Computer Science (ATI), Tartu Teaduspark,  
ESA BIC

- International Space Apps Challenge Oct 2019 Tartu
- International Space Apps Challenge Oct 2018 Tartu

- Tartu Observatory, e.g. seminar of remote sensing on January, 23th at 14:15 in Tõravere. "Overview of ESTHub applications"
- Applications of Remote Sensing in the Baltic Sea region, 15 - 20 September 2019 in Võru Kubija Spa, Estonia, Tartu Observatory and Tartu University
- Radar meteorology in June 2015: Advanced Training School on Remote Sensing/Earth Observation, Tartu Observatory and Tartu University

Optical and SAR Copernicus data for land applications, will take place on the 19. –20. February.

Applications are open until 30. January  
[aire.olesk@teaduspark.ee](mailto:aire.olesk@teaduspark.ee)

The course is organised by the European Space Agency using the [RUS Copernicus resources](#)

- Crop Mapping using Sentinel-1 and Sentinel-2
- Flood mapping with Sentinel-1
- Burned area mapping with Sentinel-2
- Active fire detection with Sentinel-3



# **RS/EO/GEO COMMUNITY**

# RS/EO/GEO COMMUNITY

About organizing ESA's Land training course in Estonia in the near future

Hackathons/events 2020:

- ESA BIC/Tartu Science Park
- Garage 48
- UT Space Apps Challenge



# RS/EO/GEO COMMUNITY

UT:

- We also are applying for a high-level joint masters programme
- OGC - Remote Sensing STAC and Cloud-Optimised GeoTIFFs
- OGC - Test-beds, OGC API WFS3 WCS Earth Server, we also teach in courses

# CONCLUSIONS, OUTLOOK, FEEDBACK

Feedback/discussion, what would you like to see more from University/Education providers?

Need of the industry? Geoinformatics, GIS, RS/EO, Physics, Statistics?

Tartu G/EO code meetup proposition

# THANK YOU

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