EUMETSAT

AI for Earth Monitoring MOOC

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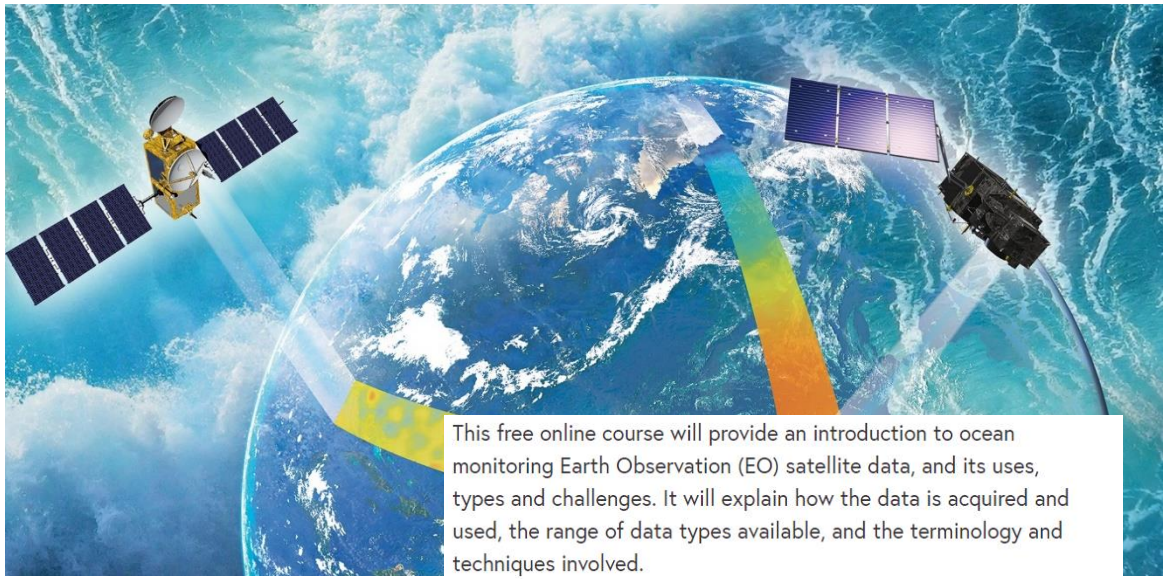
AI for Earth Monitoring MOOC

AI for Earth Monitoring MOOC

Previous MOOCs – Oceans

- **Copernicus Oceans MOOC (2017)**
- 5 week course - 2 runs FutureLearn – total 9k participants
- Strong support from users
- Weekly feedback- YouTube - community answer Qs
- http://www.oceansfromspace.org



This free online course will provide an introduction to ocean monitoring Earth Observation (EO) satellite data, and its uses, types and challenges. It will explain how the data is acquired and used, the range of data types available, and the terminology and techniques involved.

The course is presented by physicist, oceanographer and broadcaster Dr Helen Czerski from University College London,

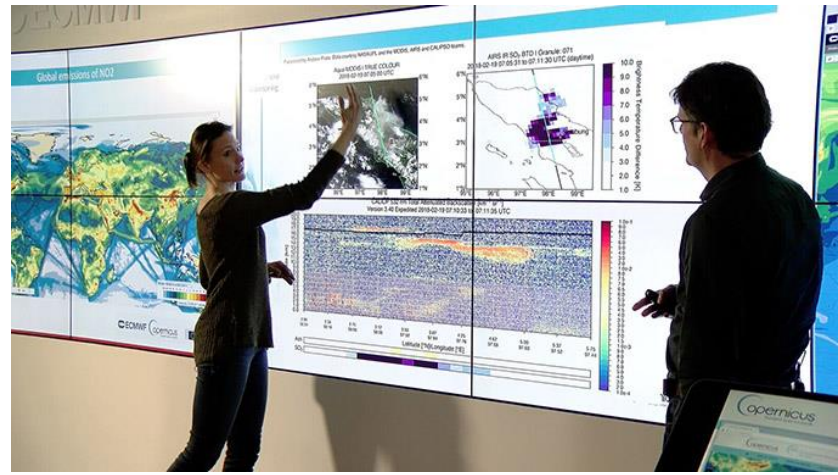
Read more

View transcript

Download video: standard or HD

Previous MOOCs – Atmosphere

- **Copernicus Atmosphere MOOC – jointly with CAMS (2019)**
- Single run on FutureLearn (3.5k people) then onto standalone site
- Live weekly feedback- on Facebook
- Linked to a Copernicus hackathon in Finland (#AtmosHack)
- www.atmospheremooc.org



Copernicus Massive Open Online Course (2021)

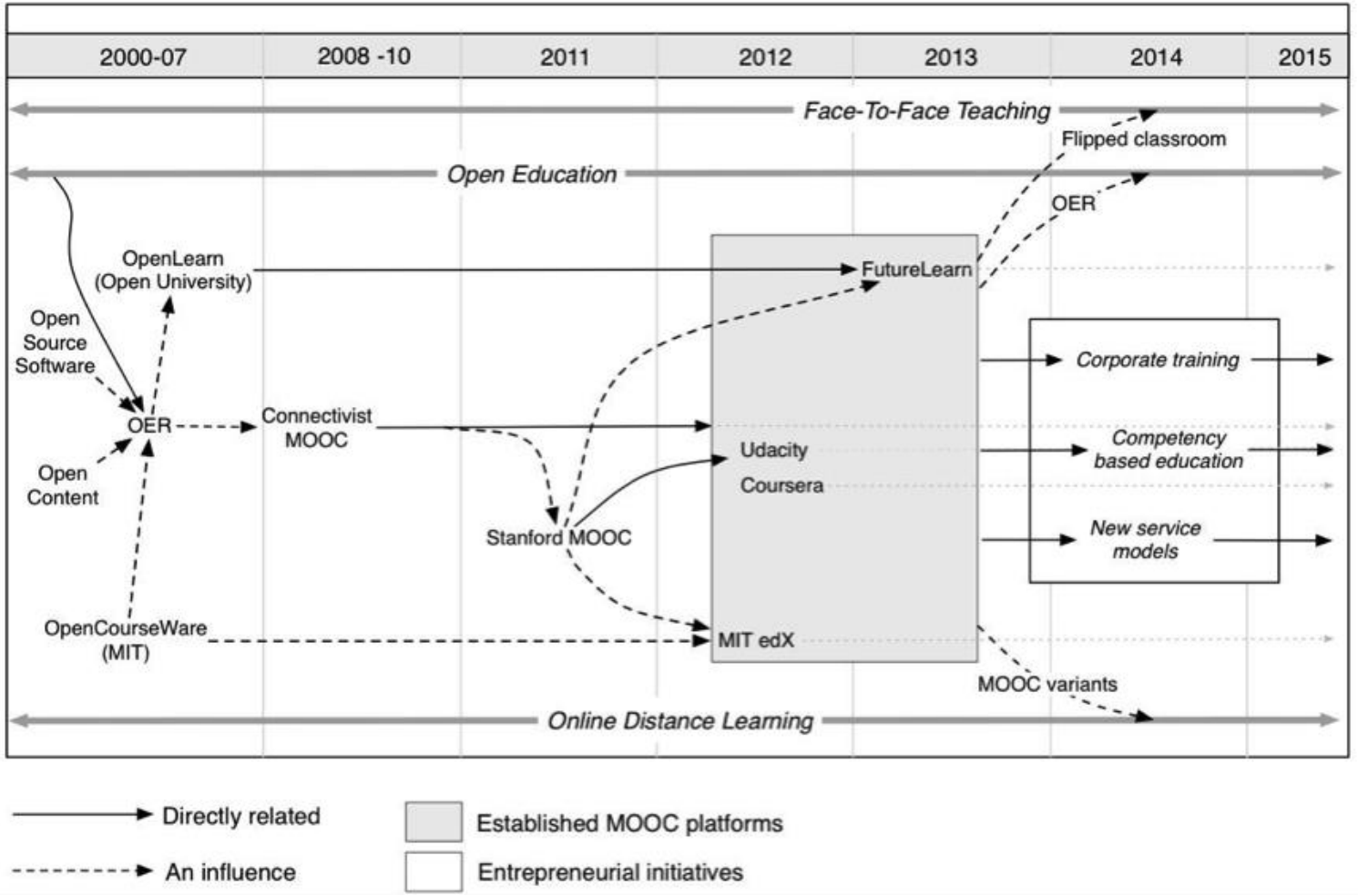
Topic - Artificial intelligence techniques & Earth monitoring with Copernicus data (via WEkEO)

Partners: ECMWF, EEA, Mercator Ocean Int

Free to access – upgrade for certificate

There are many ways to MOOC

- MASSIVE – many people
- OPEN – open to many with / without connectionist approach
- ONLINE – may on may not be in a site (#)
- COURSE – or learning experience



Education / instruction Ideas & Choices

- Connectionism: build connections between existing and new knowledge, practice the new knowledge in context with students who are ready for the experience

- Merril – principles of instruction:
  - Learning is **problem-centred** and learners are engaged in solving real-world.
  - Existing knowledge is **activated** as a foundation for new knowledge.
  - New knowledge is **demonstrated** to the learner.
  - New knowledge is **applied** by the learner.
  - New knowledge is **integrated** into the learner's world.

- Many MOOCs become "engaging information sharing" – maybe with a quiz for to test recall. Trying out the new knowledge, using it is a challenge.

MOOCs as community

- Many (1,000+) participants take the course at the same time
- Participants are global and diverse.

- If we allow for / enable connection people can help each other, much faster than teachers ☺

- The role of teacher changes – instructor *presence* still matters

- What does it mean for the participants to be a community (we come back to this later)

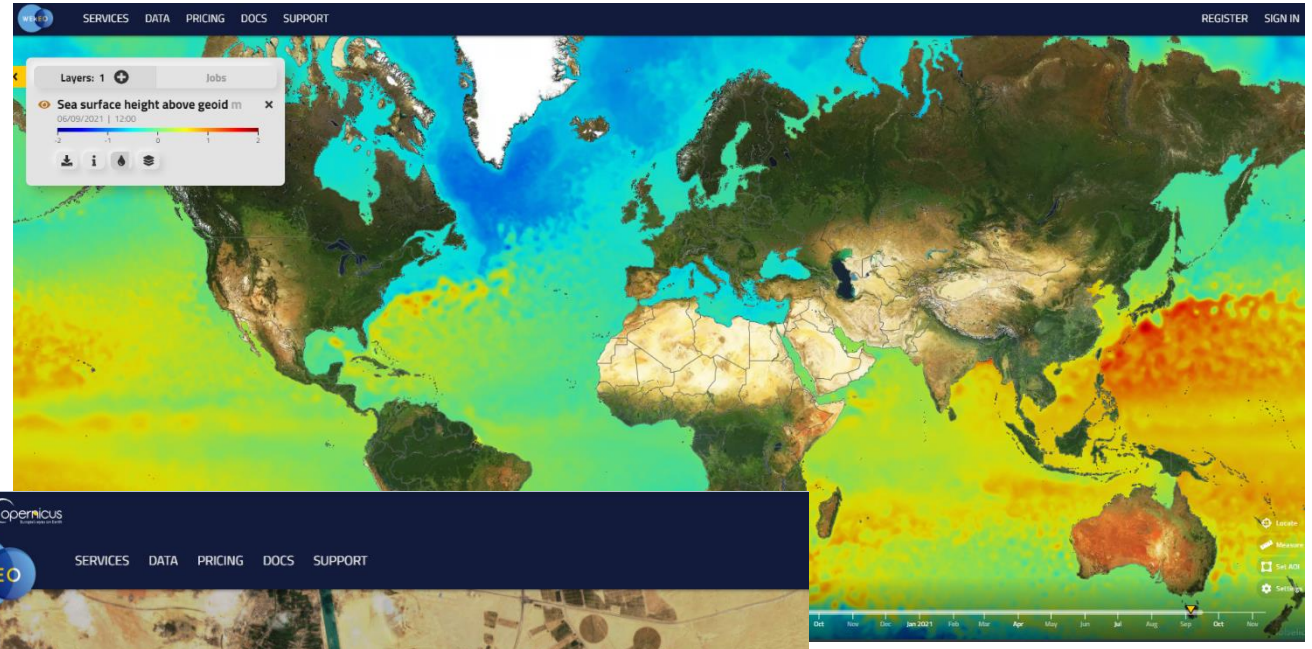
MOOC Challenges

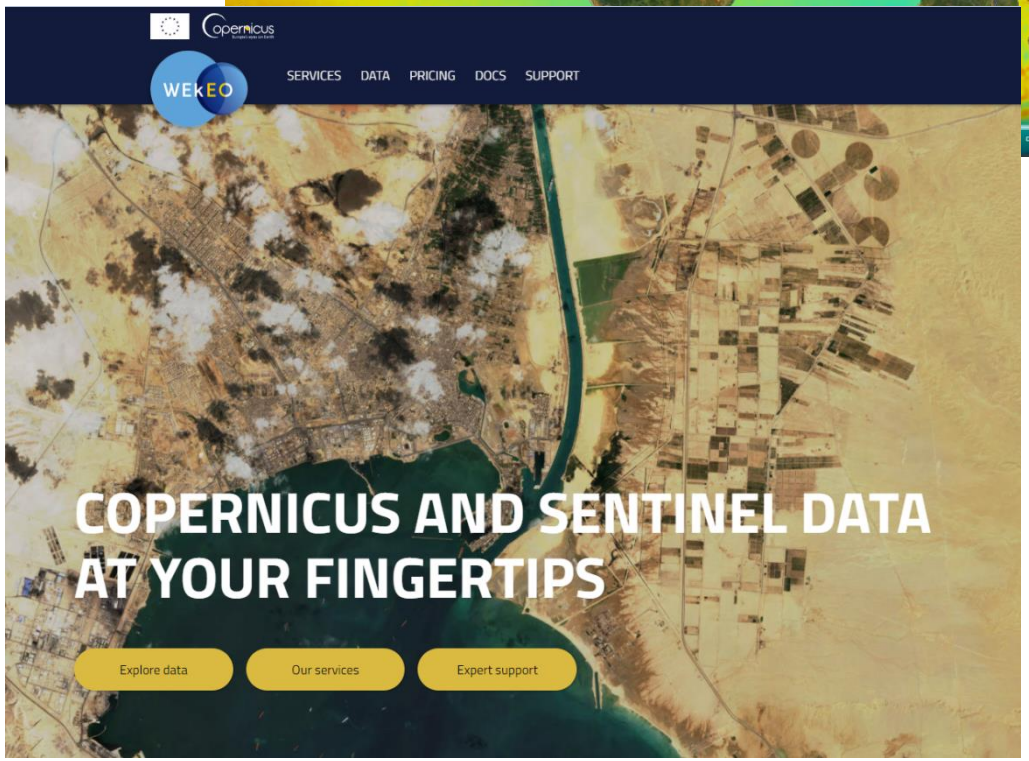
- What do I do ?
  - It is easier to create a passive, “information consumption” MOOC
  - Integration of learning requires doing stuff – creating “artefacts” and ideally getting feedback on the artefacts.
  - But … doing stuff can lead to chaos – we want the “right” amount of chaos.

- Do I belong ?
  - The massive nature of the community means lots of discussion, with people having various levels of knowledge. It is really important to help people feel welcome and able to speak – creating a positive emotional space
  - People may identify that they need more skill to take part – this is ok – even better if they feel supported and validated

Aims

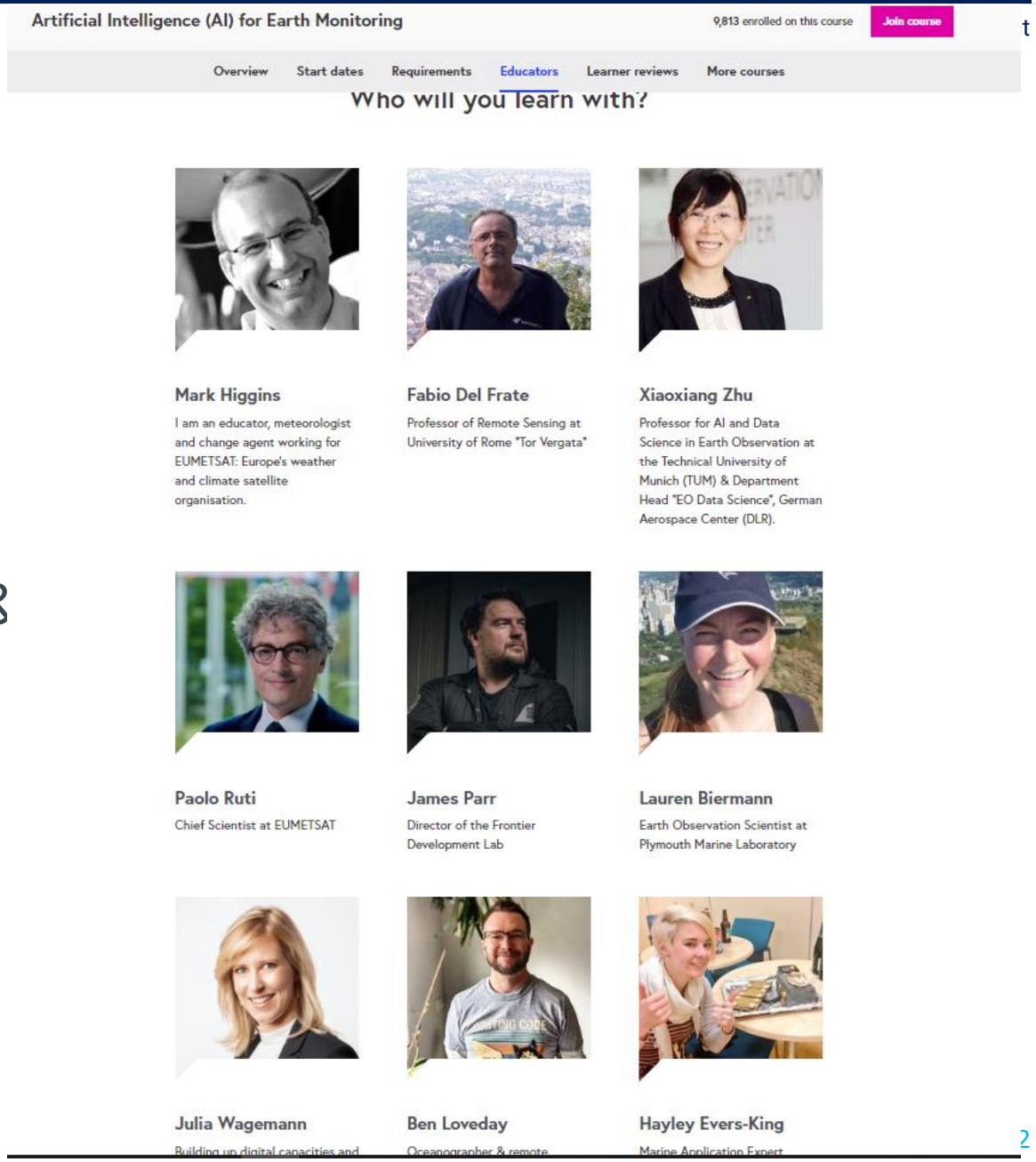
- Introduce big audience to Copernicus data and how to access it via WEkEO
- Provide examples to help people work with machine learning and Earth monitoring data
- Increase WEkEO users





AI for Earth Monitoring MOOC - Course

- Credibility – many MOOCs available
- Important to get good team of educators
- Course developed by Imperative Space, Frontier Development Lab, Munich TU FutureLab (AI4EO.de) and Univ Rome, PML & NCEO



AI for Earth Monitoring MOOC – Course

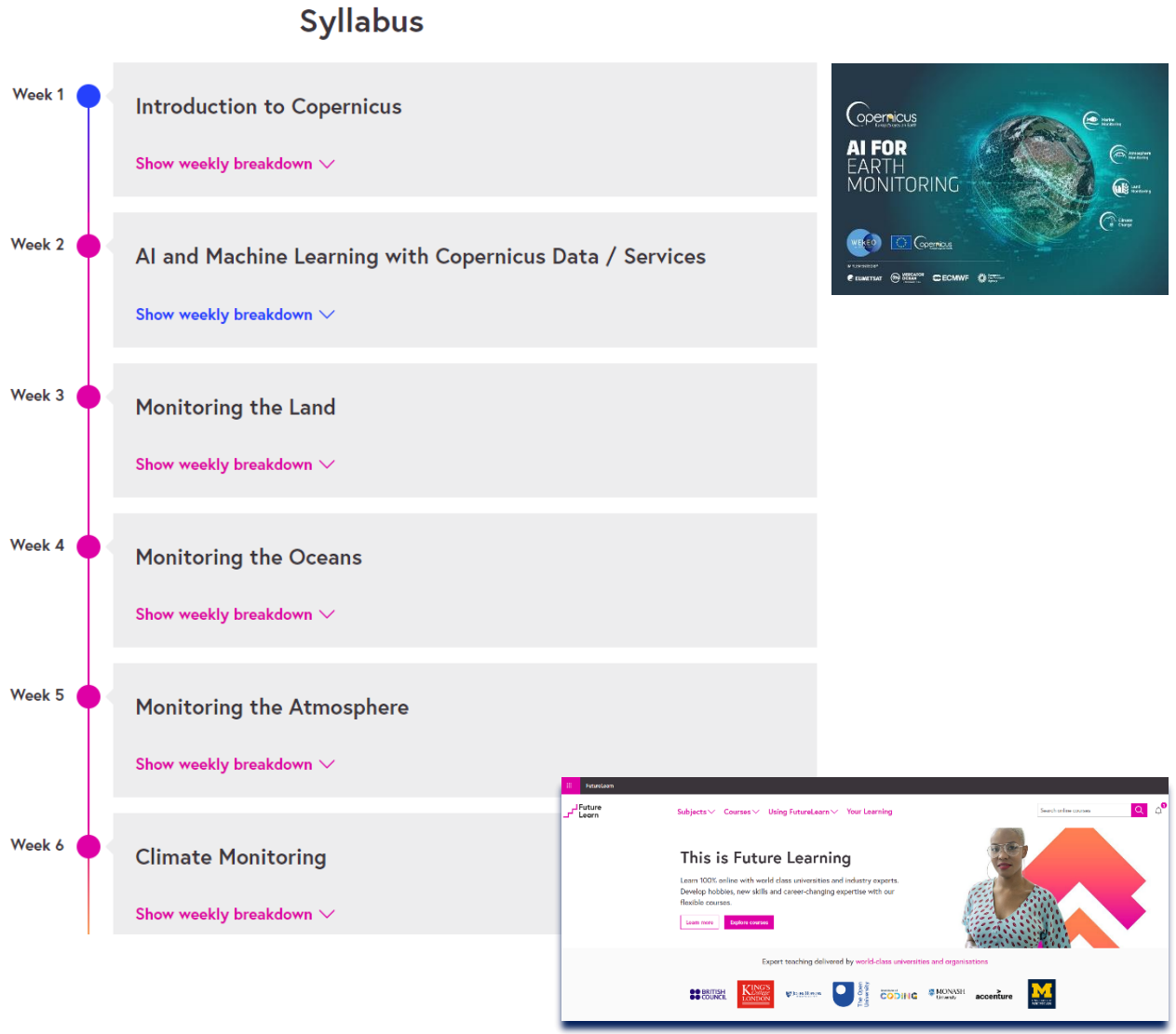
Course structure…

6 week course (estimate 3-4 hours a week)

Overall topics - Copernicus, AI, land, oceans, atmosphere and climate

Over 40 individual contributors and >50 videos

Main course on FutureLearn (13 mil users) & practical examples on WEkEO



AI for Earth Monitoring MOOC - Course

Week 4: Monitoring the Oceans

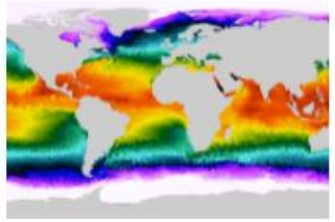
Introduction to Week 4

An introduction to Week 4!

4.1 Introduction to Week 4 VIDEO (01:21)

Topic 4a - Introduction to Monitoring the Ocean

An introduction to monitoring the oceans.



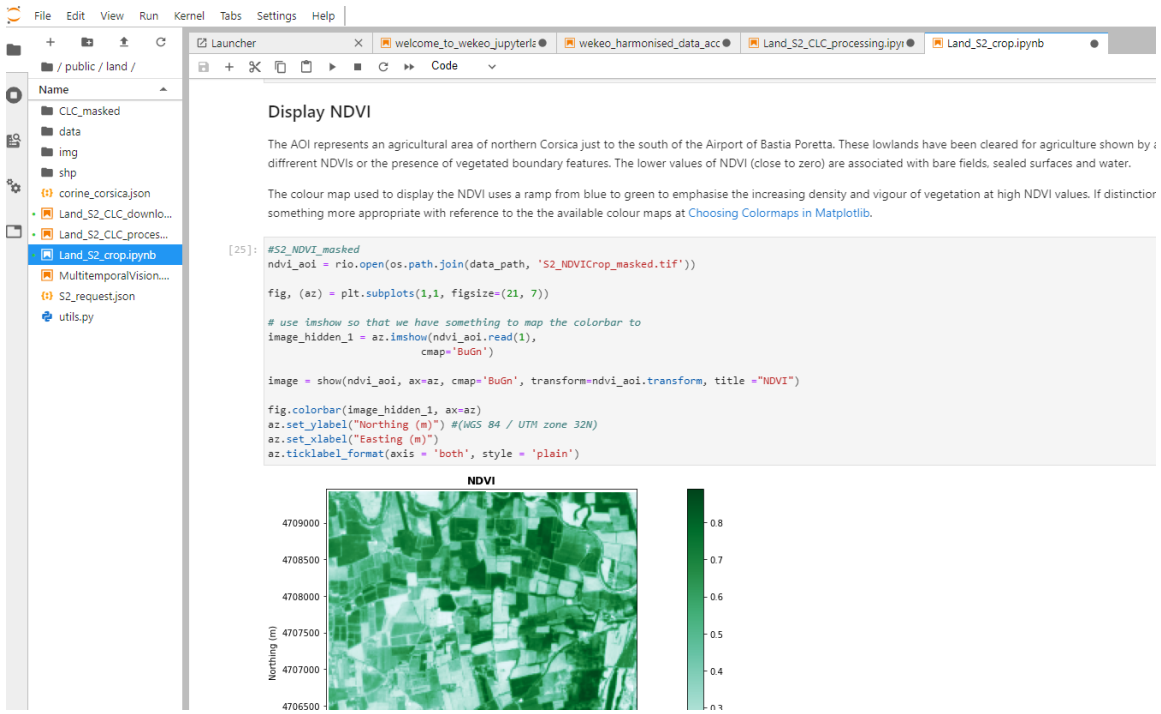
4.2 Topic 4a - Introduction to Monitoring the Ocean VIDEO (07:35)

Topic 4b - Tracking Ships

In this topic you will look at how AI and ML can help with ship tracking.

4.3 Topic 4b - Tracking Ships VIDEO (02:27)

4.4 Topic 4b: Jupyter Notebook Task - AI for Ship Classification VIDEO (24:05)



All 18 Jupyter notebooks running on WEkEO - plus videos

Marketing - main audiences for MOOC?

- General - introduce people to Copernicus and AI and how being used…
- Data scientists – aim to help people work with machine learning & Earth monitoring data…

AI for Earth Monitoring MOOC – Making it massive

How did we contact audience?

Web/social media promotion on EUMETSAT/MOI/EEA/ECMWF channels

DG DEFIS – Copernicus networks

Existing networks – EUMETSAT, ECMWF, Mercator Ocean, EEA

Targeted promotion to data science Communities….

Frankfurt Data Science/Qemie outreach

Global search for data science groups and influencers…

Then contacted as data science group

Thousands groups but difficult to break into – careful handling

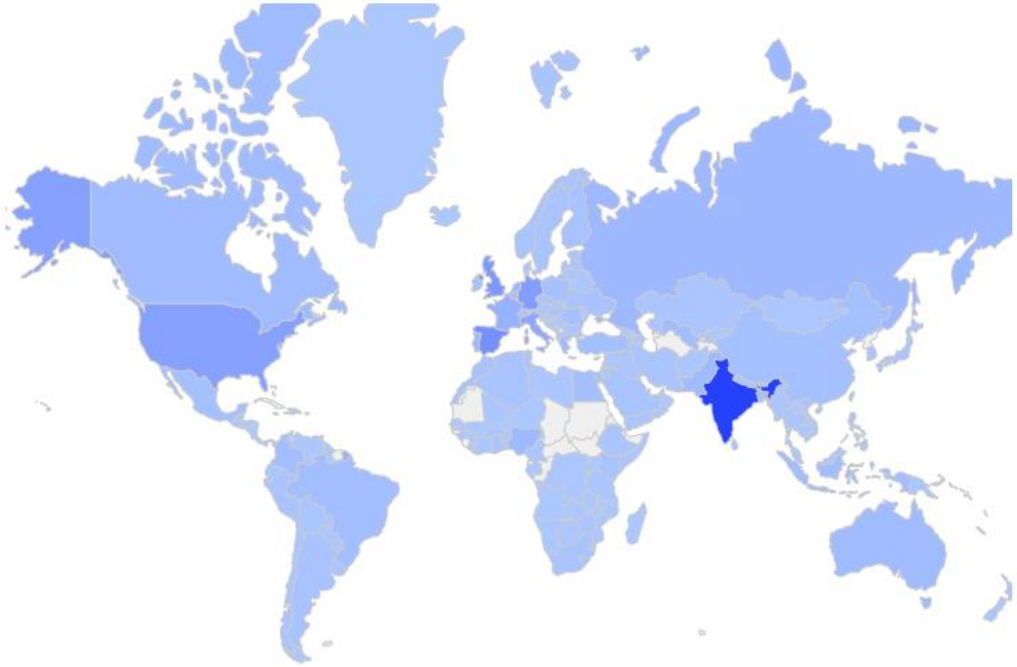
Best results on Reddit

Channel	Outreach
Meetup.com	22 communities
Facebook	250 groups, 300 community pages, 1390 users
LinkedIn	435 groups, 100 users
Twitter	80 accounts
Reddit	110 subreddits
Instagram	330 accounts
Telegram	20 channels, 30 accounts
Slack	22 sub/channels
Discord	310 sub/channels
Frankfurt Data Science onsite event	45 participants onsite 61 online via livestream

AI for Earth Monitoring MOOC – Results

To date - >9800 registrations to date for the MOOC

Artificial Intelligence (AI) for Earth Monitoring - 18 Oct 2021



7766 joiners have signed up from 167 countries

Number of joiners

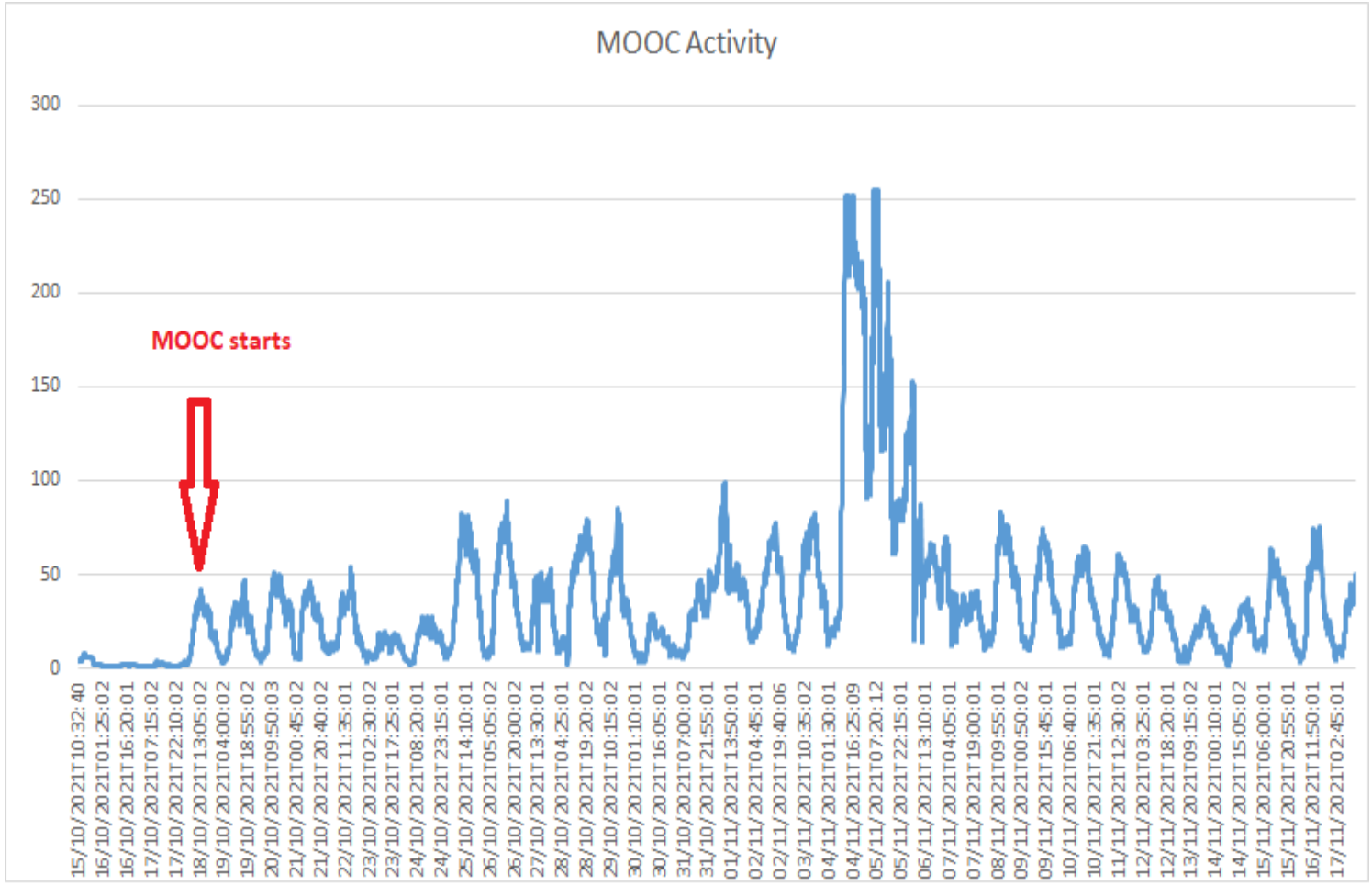
1 1371

Enrolments by age range

		Average
<18	2%	2%
18-25	19%	25%
26-35	23%	27%
36-45	12%	16%
46-55	12%	10%
56-65	8%	7%
>65	7%	5%
Unknown	17%	7%

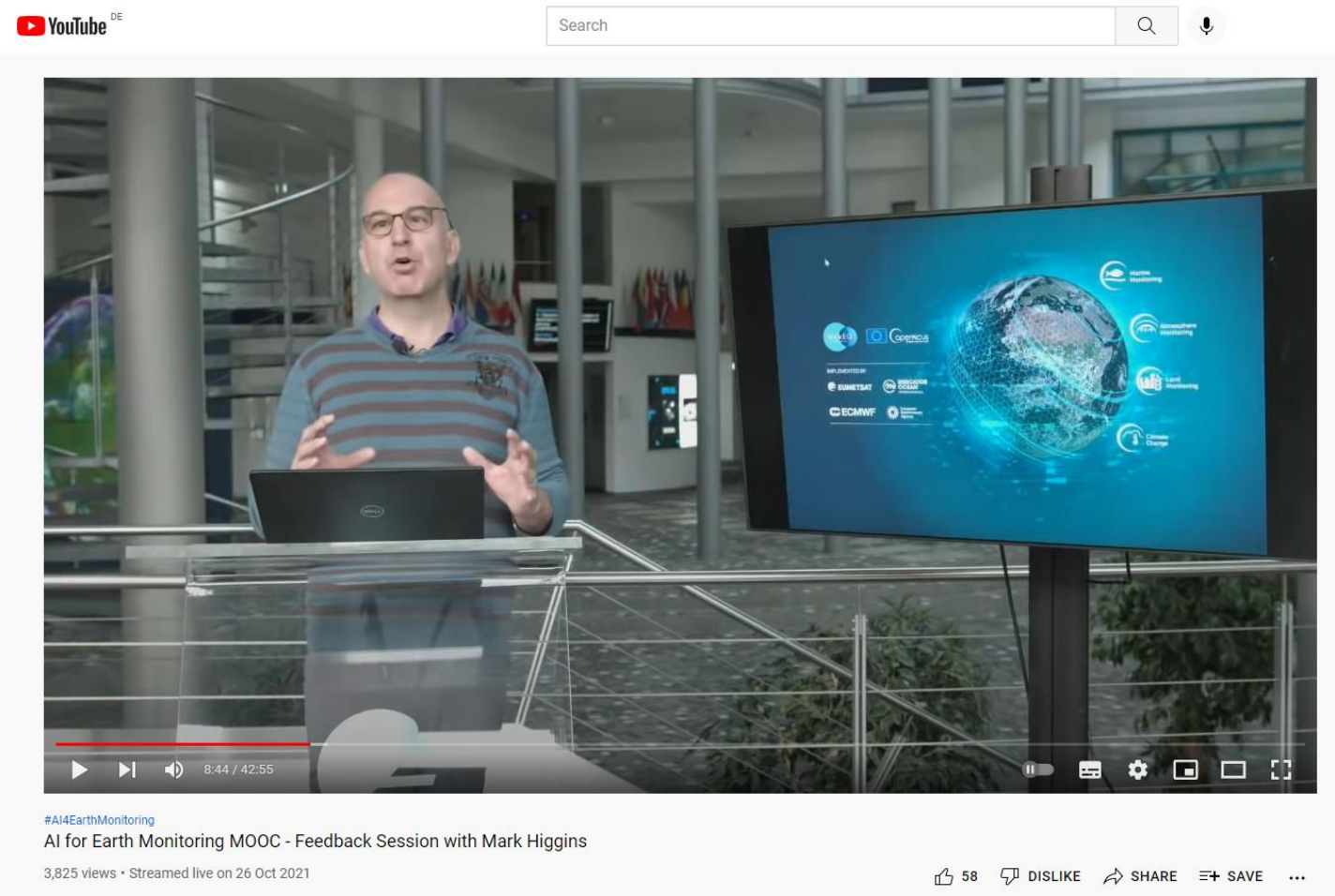
AI for Earth Monitoring MOOC - Results

>5000 new WEKEO users



Number of people using WEKEO at same time

AI for Earth Monitoring MOOC



Ran 3 livestream Q&A **>4500 views on YouTube**

WA **Wisdom Akpabio** Follow 10 DEC

Wonderful course. I really enjoyed this.

Pin Like 1 Reply Bookmark Report

TO **Tony O'Neill** Follow 08 DEC

Well done to you and your team. Both theory and labs were excellent.

Pin Like Reply Bookmark Report

CR **Cristina R.** Follow 07 DEC

Good material, good guests, interesting topics, and good answers from educators. Great course. Thankyou.

Pin Like Reply Bookmark Report

EW **Etienne Wey** Course team replied Follow 24 NOV

Very great course which gives a good multifaceted view on different ML uses on EO data. I found it useful to build some generic knowledge on ML techniques with the numerous Jupyter notebook examples and I can now understand better the technical stuff in the ML projects which I participate in at the science management level.

Thanks a lot for this huge work by all the presenters and tutors !

Pin Liked 1 Reply Bookmark

Mute this conversation

Report

sn **sabrina nappi** made a comment Follow 15 NOV

Topic 1e - Accessing Data and Using The WEkEO Platform

During the codeweek I showed the pupils how to get information from satellite images using the EO browser, which I studied without taking a course. The kids got excited and created custom images. The next study will lead us to analyze the territory, take data, analyze them and make future predictions. With this course I feel I can do it! Great course, all very...

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AI for Earth Monitoring MOOC

Copernicus EU
@CopernicusEU

21 2021 #Copernicus achievements

#2 #AI4EarthMonitoring #MOOC

A six-week-long online course on AI & Earth monitoring was launched in October and attracted 7,900 participants!

Explore the wealth of Copernicus #OpenData & use #AI, #MachineLearning to extract information

Artefacts and Scaffolding : Notebooks

- The hosted notebooks were a key innovation of this course.
- They provide:
  - Scaffolding – the learner does not start from a blank sheet – they see what is possible, and try something new – quickly
  - Pre-curated knowledge – the notebooks are not random – they provide information in a context and contain workflow and linked processes (first this, then that, …)
  - The provide a way for people to share their work with others
- Kudos to the note book team ☺

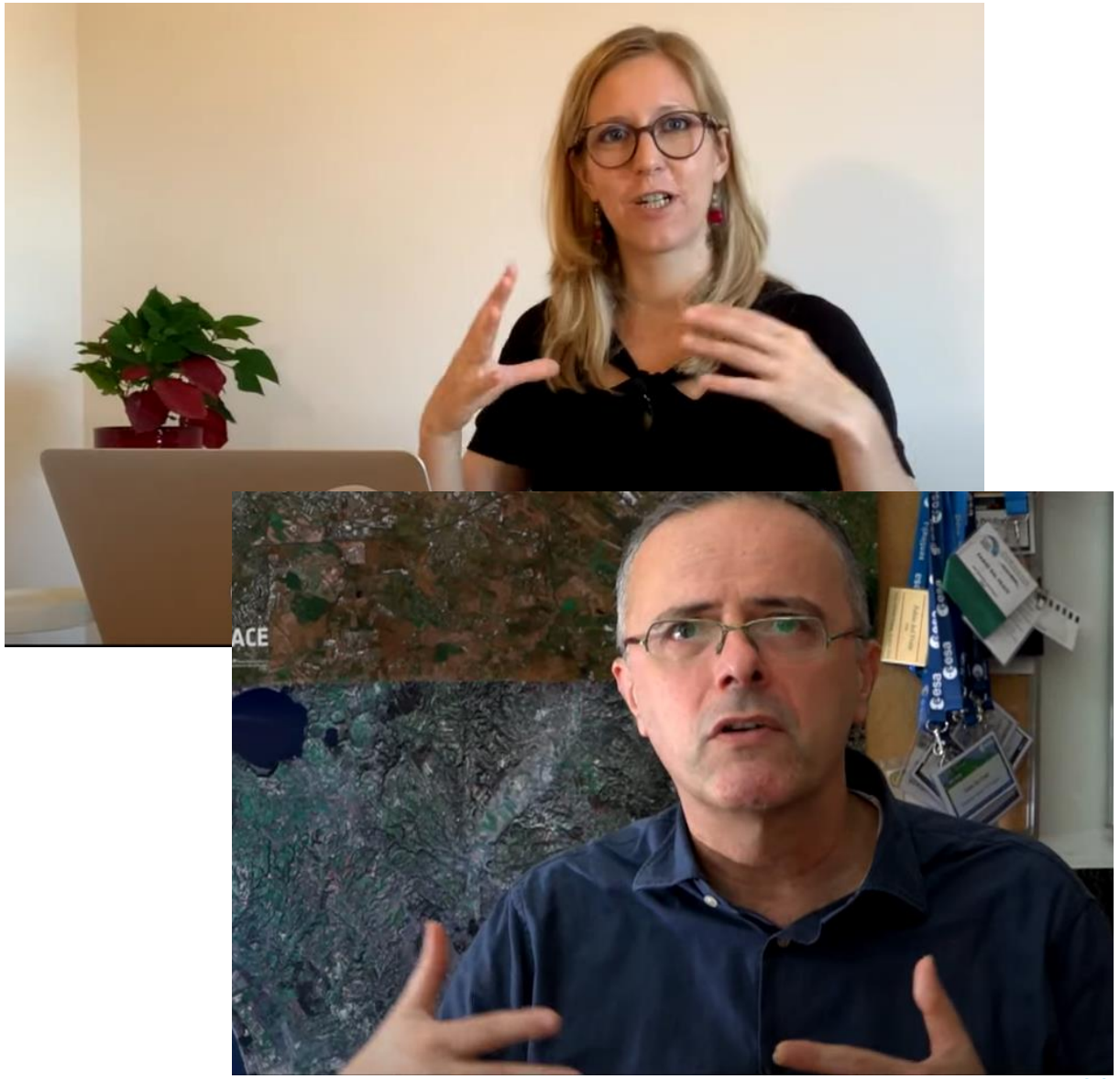
Challenges?

Covid – filming difficult – home film/sound quality

Finding examples – Copernicus data and AI

Tech concerns - big audience, new notebooks, lots of risk … company developing the notebooks wanted to use own infrastructure

Audience as community – what about the future ?



Thank you!

Any questions?