

Topic 5a – Part 2: Future innovations - Future Copernicus missions and strategies

5P was a surprise. Initially, at the beginning of the program, was not foreseen because our Sentinels are often seen in families-- Sentinels 1, 2, 3, 4, 5. Sentinels 4 and 5 are just received for the beginning of the 2020s in some way because they will fly on EUMETSAT satellites.

And suddenly, the possibility to launch a precursor arose. And the surprise first apart from the launch and everything was the good quality of the data. I mean, I'm not an atmosphere expert myself. But I can tell you that the feedback I received from all the users is a really good surprise this satellite is delivering. Very good, excellent images. And probably the satellite that's been designed just to deliver some images, some products.

But as usually happens, probably looking into that it will able us to generate, to see new things, new products, and help probably also to design new things for the future. So Sentinel 4 and 5 are in the pipeline. But already today we are thinking to the next generation that will come after probably 2030.

Where do you see the future? You've said, you know, these spectrometers now allow you to see a wide range of species. How much better can it get? What's your ideal system?

Oh, my ideal system, that would be fantastic. So there are challenges. Of course, there are always challenges. One of them is to take the technology we now have with these spectrometers not just into the lower Earth orbit which we use now, where you get measurements maybe every day but every couple of days over a particular place. We want to do that from geostationary orbit. And the next generation of satellites, Sentinel 4 particularly, will do that from that geostationary orbit. We'll be able to do it every half an hour, every hour on a regular basis to do that. It's an incredible step forward.

So there's no escaping. In the past, you know, a satellite would come over the top and then it might be a little while before it came over the top again. And things could happen and you wouldn't know.

That's right, indeed, indeed.

And that spotlight is going to let you just watch?

Yes, indeed. The other holy grail is to try and get more and more vertical information. So we can do spatial very well in some respects. We'd like to get finer and finer scales.

So that means if you're looking downwards, you can see lots of detail from the top down.

Yeah, you can now probably sort of encapsulate a city and get a few points across the city. But you'd like to differentiate cities, different paths.

But we also want to do exactly the same in the vertical. We'd like to salami slice it, if you like - up and down. We already do that, but we don't have that as an operational system quite yet-- going right down from the top to the bottom. And I think that we'll come back to that and want to extend our systems that way. There are instruments that do that at the moment. But we want to see them in the future.

And there are also laser-based instruments.

Which sound very space age.

Yeah, I think they're really quite exciting. They're very specific. But they already use them for clouds and aerosols, to use those for trace gases as the sort of thing that for understanding atmosphere, we'd really like to see in the future. Maybe that's about 20 years away. Who knows? But there is a mission that is likely to fly in the near future which, if it's successful, will point the way.

Our space strategy actually was adopted in 2016, is insisting on two priorities. First one is the continuation and the second one is about evolution. What does it mean for Copernicus? It means that we don't want to stop the services that we are doing together.

We have created expectations from communities of users, but also industry. So it's very important to continue to invest into that.

There is also a huge number of small and medium enterprise in the downstream sector that are ready to invest in some research in order to make use of our data only if they are reassured that this data will not disappear tomorrow, if they will continue the long term. This is extremely important, to have continuation about the program.

But we do not have to stop where we are. I think there are new challenges. And this is the reason why the evolution is also extremely important. And as the space strategy mentions, the areas are mostly based on the climate change issues, in particular CO₂ observation and greenhouse gases observations. And there there is a clear link with atmospheric composition.

We are thinking about the polar regions that are not fully covered. So to try to understand better what's happening in the Arctic and in the Antarctic for several policies. And possibly, but this we have still to see how it can be framed, about security aspects, so how to reinforce support to migration policies, maritime surveillance, or support within elections of the European Union.

And why not maybe to expand even further on security aspect? But this is, I think, still an open discussion.

What is very important for us is that a citizen is not looking to Copernicus as a space program only. It's really space for the earth. Because by definition, space is expensive. But if we make the citizen understand that everything that is generated by space to Copernicus is for their benefit, I think there we are already winning our goal.

Today we have really tools that are coming directly from the space to your computer so you can either look to forecasts generated by someone else. But you can play also with this data for you.

And I think we are more and more used to work, for example, with our iPhones-- to have everything into that. And what we are doing through Copernicus is not just the generating data from the satellites, but actually generating products that you can see on your machine that you're bringing all the time in your pocket.

So I think this is really participating to the need of knowledge of the citizens in everywhere. And what I sometimes used to say about Copernicus-- also when I'm playing with my children-- is to say to my children actually, your father is working to the biggest selfie system of the world.

Because actually you are looking to your planet. You are looking in a big scale. But also it is helping to understand your planets-- if it's healthy, but also the challenges it is facing.