Open Science 2030

A Day in the Life of a Scientist, AD 2030

The year is 2030. Open science has become a reality and is offering a whole range of new, unlimited opportunities for research and discovery worldwide. Scientists, citizens, publishers, research institutions, public and private research funders, students and education professionals as well as companies and citizens from around the globe are sharing an open, virtual research environment, called the Lab.

Open source communities and scientists, publishing companies and the high-tech industry have pushed the EU and UNESCO to develop common open research standards, establishing a virtual learning gateway, offering free public access to all scientific data as well as to all publicly funded research.

The OECD (which now includes Brazil, India, China and Russia), as well as many countries from Africa, Asia and Latin America have adopted these new standards, allowing users to share a common platform to exchange knowledge at a global scale.

High-tech startups and small public-private partnerships have spread across the globe to become the service providers of the new digital science learning network, empowering researchers, educators and students worldwide to share knowledge by using the best available technology.

Free and open, high quality and crowd-sourced science, focusing on the grand societal challenges of our time, shape the daily life of a new generation of researchers.

This is an account of a day in the life of Chiara, one of these scientists, and the way she interacts with the scientific ecosystem, anno 2030.

5am GMT	Chiara is a young Italian expert in marine biology living on Santorini, Greece, where she runs an underwater laboratory on behalf of a number of European and global research institutes.
	At around 8am local time she wakes up and, while enjoying breakfast, connects to her account on the Lab – the global virtual research environment – to check recent messages and posts. She has just published a new report on the use of technology to improve the quality of marine life around the Greek island, and has shared her findings with her friends and colleagues on the network.

Automated discovery tools have informed the larger scientific commun ity about the findings, and the report has already received quite some positive feedback. Chiara can evaluate the many likes but also the more substantial comments and requests for additional information she has received overnight. The feedback she gets and the knowledge she shares through the Lab will improve the quality of her research, while integrated Lab metrics will increase her overall ranking in the science communities she is part of, as well as her scientific impact and reputation.

6am GMT	Anand is a former university librarian who lives in Durban, South Africa, and who has reoriented his career a few years ago to become a freelance science publisher and curator. He has read about Chiara's projects on the Lab and is about to send her an instant message in relation to her work, requesting to have one of her previous reports published in a new ebook he will bring out, which will be focusing on the use of robots to protect marine reserves and monitor marine ecosystems.
7am GMT	Helen, a scientific expert at the European agency for marine research in Split, Croatia, is using the funding interface available on the Lab to flag funding possibilities in relation to a new research project she has been discussing with Chiara recently on the Lab. Helen explains that public funding by the agency is open to public-private research partnerships, provided all research output and data are made available for reuse on the Lab, and as long as the proposal tackles at least three of the societal challenges defined by the EU research and innovation framework programme.

8am GMT	It's 11am on Santorini. Chiara has spent part of the morning helping her kids through some research for the online science classes they are taking through the Lab. She is now updating her new report with the feedback she received overnight, while her tablet is processing some new raw data provided by GAIA, the citizen science earth observation monitor. This artificial intelligence system, which is available to all users of the Lab at no cost, provides crowd-sourced data from all over the globe on a wide range of topics. The data are collected by the millions of citizen scientists, whose devices are connected 24/7 to a datacentre, which is – like the Lab – funded by the EU, the US National Science Foundation and other public and private donors from around the world.
9am GMT	James, a citizen scientist running a diving centre in the Maldives, who is actively engaged in fighting coral poachers in the area, checks the diving gear used during his recent expeditions, as well as the smart sensors that have been collecting data about marine life in the Indian Ocean archipelago. These data will be made available for research purposes to Chiara and thousands of other marine biologists and other scientists around the world through the GAIA earth sciences database, and are immediately and directly available to all members of the Lab.

10am GMT	Jonathan is an anthropologist living on the Bahamas and working for the International Geographic Society in the Caribbean. He is preparing a new documentary on fish shoaling, and how this could relate to human crowd behaviour. As a member of the virtual research platform, he has access to a large database of potential scientific collaborators, and has selected Chiara to participate in his project.
11am GMT	Chiara has just finished lunch with her children. She has received Jonathan's request, and read an extensive overview of his projects on the International Geographic Society's Lab page. Besides being professionally interesting, a trip to the Bahamas would also offer a welcome break for Chiara and for her family, she gladly accepts the invitation.
12pm GMT	Catherine, the scientific director of the European Institute for Earth Sciences and Natural Resources in Paris, would like to invite Chiara to participate virtually in the conference on research in underwater laboratories she organises at the end of next month in the French

capital, as well as through a live broadcast on the Lab. She posts a message to Chiara, including a link to the announcement of the event and some background material related to the conference.

1pm GMT

Gordon, a London-based freelance education professional specialised in earth sciences, is developing a Lab introductory course on marine biology. He has been in touch with Chiara through the virtual research platform, and would like to know if she is available for an interview later this month, and whether any new research could be used as part of the course material. Gordon also informs Chiara about several requests he has had recently from students who would like to participate in one of her projects.

2pm GMT

Chiara, who has been out at sea the whole afternoon in order to conduct her research together with several of her team members, has been informed about the requests sent by Gordon and Catherine on her digital bracelet. This smart device, which is connected to her diving gear, not only helps her to keep up-to-date with het network, but it also helps her keep track of valuable information for the research she is dealing with, and which she would not be able to collect otherwise in her marine environment. Because the device is also connected via satellite to the Lab, it can send the data immediately to the global research platform, which saves time and provides a back-up for the information at the same time.

3pm GMT

Carlos, the curator of the science museum in Coimbra, Portugal, is preparing an exhibition on corals and would like to show some of the specimen Chiara collected. He sends a request to Chiara asking her to scan the specimen so he can 4D print them, and put the copies on show at the exhibition.

4pm GMT

Rafael, Chiara's husband, is a Cuban-born marine archeologist. He also lives and works on Santorini and shares part of the marine research facilities with Chiara. He just returned from a diving expedition near a neighbouring island. Since he has also been able to collect some data on invasive species that might be useful to her, he shares his findings with Chiara and her team.

5pm GMT	Chiara has completed her field research for the day and invites Rafael and some members of her team for dinner, to take a look at the footage collected during their afternoon diving session, as well as to discuss the new proposals she received today – including the

trip to the Bahamas which will come as a surprise to her husband. The manager of the local seafood restaurant they are attending has recently teamed up with Chiara, using her research to enhance his interactive menu, while at the same time promoting sustainable fishing practices.

6pm GMT	David, who lives in Redwood City in the San Francisco Bay area, California, is running a start-up which is collecting and processing satellite data for scientific purposes. He posts a set of charts and maps on Chiara's Lab page using data collected over the past months, and which could feed her specific research purposes.

7pm GMT	Daniel is a marine biologist living on Tahiti, and the team leader of a project using electric biorocks to save endangered coral reefs, run by a French NGO and sponsored by a local clean energy company. He is very

interested in what he has read about Chiara's recent research and would like to team up with her to start a new project in Polynesia. He connects to her through the Lab and shares a first draft proposal with her.
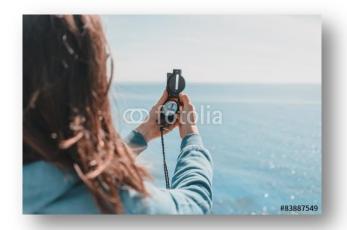
8pm GMT	Zhang Li is a Chinese science blogger living in Seoul, Korea, and who works for Pacific Research, one of the world's leading science hubs and a major donor to the Lab. She has just registered for Gordon's new online course through the Lab. She has also read about Chiara's work and sends her a message with the request to join her team on Santorini next Summer.

9pm GMT	Before going to bed – it's around midnight on Santorini – Chiara checks her latest status on her personal page on the Lab. She is very interested in Daniel's project proposal, and gladly accepts to discuss a possible partnership. She also analyses the information sent earlier by David, and which will feed the paper she will work on tomorrow morning.

Finally, she answers Zhang Li's request and sends her an overview of the available dates, where and how she could join in, as well as some public and private funding possibilities that could be used to pay for her stay in Europe during the Summer.

Science has become a global, multi-faceted enterprise in 2030. 'Scientists' are no longer just academically trained people stuck in laboratories or libraries, in some remote relationship with other specialised people in the field, but are more like modern day adventurers. The scientific process has become much faster and much more interactive; it involves many more people from very different areas, with different backgrounds, than used to be the case in the early stages of the 21st century.

Big Data and the Internet of Things have also changed science. The scientific landscape has exploded with the continuous exchange of trillions of data between billions of people, involving top-level researchers as well as citizen scientists, but also more artificial intelligence, in the scientific process.

In 2030, science has gone full circle, not just geographically, but also in the way it is being generated. Citizens have become much more engaged with science because they are now an active part of the scientific ecosystem, and are much more directly concerned with the input, the output as well as with the outcome of the scientific process.

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