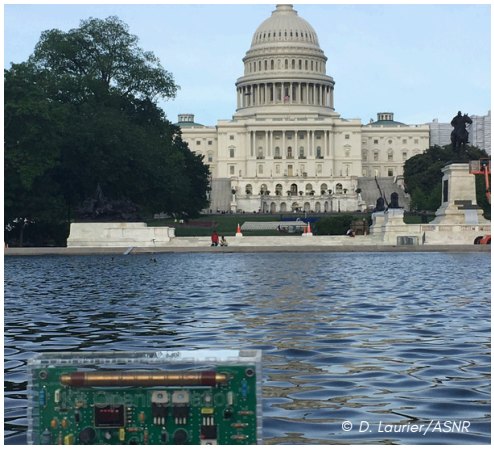
January 2026

THE OPENRADIATION LETTER

Newsletter issue 3



EDITORIAL

Dear contributors,

This summer, on 16 July to be exact, the OpenRadiation database reached a symbolic milestone: **more than one million measurements recorded**. This milestone is testament to the vitality of our community, with a constantly growing number of contributors and measurements in France and abroad.

However, one question keeps coming up: what is the purpose of the data? This topic was discussed at **the seminar in Brussels** in June 2025, an event which is covered in this newsletter. Beyond the 'historic' Cosmic on Air study, which tracks solar winds, several studies have recently drawn on OpenRadiation measurement results:

· One of these, the **Corale study**, is the subject of a detailed article in this newsletter.

· The **CIThARA project**, meanwhile, aims to develop artificial intelligence tools to facilitate the analysis of OpenRadiation data. This approach could make it easier to identify areas of high natural radioactivity and provide scientists and experts with datasets on natural background noise. The project, funded by the European Union, will start in early 2026. We will discuss it in more detail in a future issue.

Other research projects using the OpenRadiation platform are currently being considered. But be prepared! Some will invite you to participate in 'measurement challenges,' which involve taking as many measurements as possible within a given time frame and geographical area. Others, such as **CORALE**, already encourage you to take your detector with you when travelling abroad.

At the same time, OpenRadiation continues to evolve. In particular, the **questionnaire survey** conducted in spring 2025, also presented in this Newsletter, provides us with important guidelines for improving the platform. One of the first projects we will tackle is the display of measurement points on the map. We would like to thank everyone who responded to this survey!

All of this tells us that the **OpenRadiation community is a lively, active and committed community**. Thank you all, to your sensors, and best wishes for 2026!

ANCCLI

*The **ANCCLI** (National Association of Local Information Commissions and Committees) brings together and supports CLIs (local information commissions), which are local forums for dialogue on nuclear sites. Its mission is to ensure transparency, public information, and democratic debate on issues related to nuclear energy and radiation protection. It serves as an interface between citizens, elected officials, associations, experts, and institutions, promoting trust, citizen vigilance, and public understanding of scientific and technical issues. In this context, as a partner in the OpenRadiation project, it works to promote participatory science in the regions, encouraging local information commissions and citizens to get involved in measuring and understanding radioactivity.*

WHO ARE THE CONTRIBUTORS TO OPENRADIATION ?

A recent survey sheds some light on the situation: an engaged, curious and motivated community, but one that wants more interaction, better tools, more educational content and a modernised application.
The good news is that 92% recommend the project!

In order to better understand our contributors, their practices and their needs, we conducted a survey combining interviews and an online questionnaire. Outside of the annual community day, direct exchanges are rare, which limits our understanding of their practices and slows down the development of the project.
The results show that the majority of contributors are working or retired, with an average age of 56.5, and 60% come from the nuclear sector. Their participation is often sporadic, motivated by personal curiosity, citizen mapping, technical interest in the device, and concern for the environment. The main obstacles mentioned are lack of time, technical problems with the application and incomplete publication of measurements. All of this reduces the collective interest in the project.
Several needs have been expressed:

- **Better communication and collaboration tools**: setting up a discussion forum (e.g. Discord) and collaborative media
- **Easier access to knowledge**: tutorials, videos, infographics and workshops to explain radioactivity and welcome new contributors.
- **Technical improvements**: modernisation of the application, simplified access to data, optimised management of sensor loans, addition of interactive tools.

Contributors emphasise the importance of international openness, more playful approaches and the creation of local projects to strengthen engagement. Above all, we note a very encouraging finding: 92% of respondents would recommend OpenRadiation positively.

Thank you to all contributors who responded to the questionnaire and interview requests!

Thanks to Arthur, an M2 student at the French Institute of Geopolitics (IFG), who conducted this survey with enthusiasm and professionalism!

Review about the Hackathon

The hackathon was made possible thanks to Christian Simon's warm welcome at **the Sorbonne University FabLab** in June. Twelve participants took part: Christian Simon, Thomas Jolivet (Planète Sciences), Christine Lajouanine (Planète Sciences), eight undergraduate and master's students mainly focused on physics, and a lecturer-researcher.
The OpenRadiation project was first presented, accompanied by an overview of commercial and open-source radioactivity measurement devices and related technologies. The aim of the hackathon was to improve the educational sensor. Several ideas were proposed to the students: integrating a screen to display measurements in real time, adding data storage, transforming the mobile sensor into a fixed station, and integrating a scintillator detector to create a gamma spectrometer.
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The participants chose to develop the latter option, mainly for its high educational value in identifying gamma-ray emitting atoms, to replace the Geiger-Müller tube with more robust and accessible microelectronic components, and in the hope of simplifying calibration procedures.
Research conducted during the hackathon identified several open-source DIY *gamma spectrometers, including the detailed PhysicsOpenLab project. Christian Simon confirmed the feasibility of moulding homemade scintillators, although the question of their optimal shape (cylindrical or parallelepiped) remains open.*
In terms of electronics, the ESP32 currently in use has been retained, with the suggestion of adopting an M5Stack module incorporating a screen, buttons, battery and microcontroller in order to improve reliability and modularity and reduce costs, an approach already explored in certain versions of the Safecast kits.
At the same time, Thomas Jolivet succeeded in getting the sensor and application to work with an integrated screen. Following the hackathon, a student embarked on a research project on synthetic scintillators, which she continues on a weekly basis.

Citizen science and radioactivity: a European workshop to strengthen environmental monitoring

The workshop '**Citizen Science in Radioactivity Measurement: Empowering Europeans for Better Environmental Monitoring**' was held on 4 June 2025 at the Maison Irène et Frédéric Joliot-Curie (MIFJC) in Brussels. The event brought together around 40 participants, including representatives from the Joint Research Centre (JRC), the European Commission (DG RTD), the European Citizen Science Association (ECSA) and representatives from research institutes, nuclear safety authorities and citizen networks for measuring radioactivity.
During the workshop, several citizen science projects dedicated to measuring radioactivity were presented. Discussions focused on existing initiatives, challenges encountered and future opportunities to strengthen the European dimension of citizen science in radioactivity monitoring. Participants also addressed the issue of the sustainability of citizen involvement and the integration of citizen data into decision-making processes. This meeting provided an opportunity to discuss future projects for OpenRadiation and other European citizen-led radioactivity measurement networks. In addition, the ECSA offered to host a think tank to coordinate radioactivity measurement activities, while benefiting from the association members' experience in citizen science.

OpenRadiation and you

Whether they come from the world of nuclear research or electronic engineering, Philippe and Olivier share the same conviction: citizen-led radioactivity measurement is a collective adventure, driven by curiosity, sharing and knowledge transfer. The former set about manufacturing the sensor with the help of his engineer son, while the latter created a fixed measurement station. Their stories illustrate how OpenRadiation brings together different profiles around a single project.

My name is Philippe Massiot, a former member of the CEA, and I spent my career as a researcher in radiotoxicology on mixed uranium/plutonium fuels before turning my attention to teaching radiation protection.
It was in this context that I met François Trompier from the ASNR, who also teaches on the Master's in Nuclear Energy programme at Paris-Saclay University. Over coffee, François spoke enthusiastically about the OpenRadiation project and immediately convinced me to participate. I started taking various measurements with the turnkey sensor, then I thought it might be interesting to assemble the kit. The problem was that I had no experience in assembling electronic components on a circuit board.
That's when I immediately thought of my son Justin, an electronic engineer, who might be able to help me with this project. Justin not only agreed to help me assemble the kit, but also offered to film the assembly process with an educational approach for beginners. I was immediately won over by this proposal, which was in line with the participatory and inclusive nature of the project.
With the electronic diagram and the instructions provided by Francois, we made sure we had all the components and tools we needed to achieve our goal.
It is clear that to undertake this type of assembly, you either need to know a little about it yourself or get help from a professional. Justin's skills were indispensable in helping me. The assembly was carried out very gradually, with the video emphasising the key points to avoid beginner's mistakes. It took half a day to assemble the kit, and the goal was achieved: the sensor worked.
Now we need to edit the film, which needs to be shortened if we want to attract as many internet users as possible. There is still a lot of work to be done if we want to encourage novices to get started.
I believe that posting the video of this work on the OpenRadiation YouTube channel should help to expand the community. It should help to create a popular dynamic and expand the mapping carried out by citizens who are curious about the phenomenon of radioactivity.
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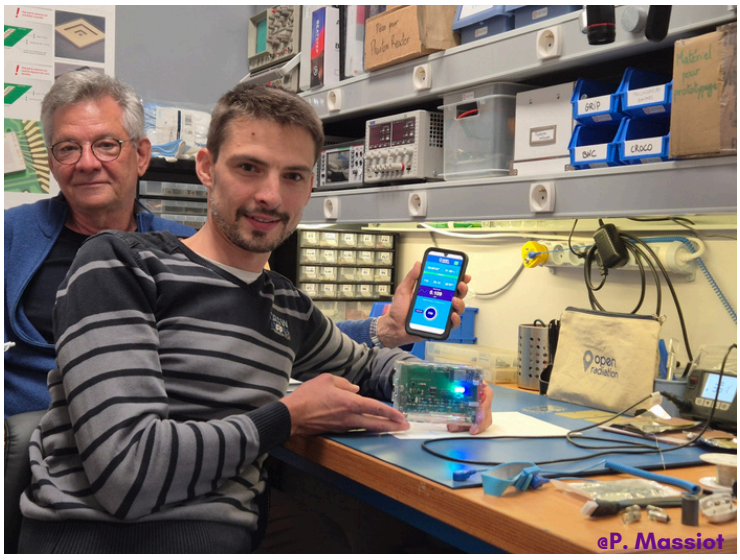

OpenRadiation and you

My name is Olivier Schmitt. I have been passionate about electronics since childhood (electronics baccalaureate, DUT Telecoms and Networks), and now work as a computer engineer at the Faculty of Physics and Engineering in Strasbourg.

My amateur weather project (https://meteo-bindernheim.fr/) was born out of a curiosity for radio transmissions. As a radio amateur, I began analysing protocols on 433 MHz using an RTL-SDR key to decode frames. I quickly realised that these same tools could be used to retrieve data from small weather stations and make it accessible on a mobile phone or even on a website open to everyone.

It was through the SismoCitoyen project dedicated to participatory seismology that a colleague introduced me to the world of citizen science and its communities. While searching for similar initiatives, I came across OpenRadiation and wanted to contribute myself.

After making initial contact with you, I ordered and received my OpenRadiation kit. Assembly is fairly straightforward, and the instructions are clear and well illustrated. There is nothing unusual about it for someone who is used to handling a soldering iron and identifying electronic components. Everything is well designed so that assembly can be carried out without any major difficulties. It is also an excellent way to familiarise yourself with the sensor before deploying it in the field.

To take things further, I wanted to set up a permanent measuring station. Having already experimented with continuously operating sensors, I designed a small gateway based on a Raspberry Pi Zero. A Python script collects measurements locally via Bluetooth from the sensor, decodes the frames according to the protocol published on OpenRadiation's GitHub, and then automatically transmits the data over the Internet via Wi-Fi, both to my personal website and to the OpenRadiation platform.

Everything runs on Alpine Linux, a lightweight and robust system that I regularly use for my IoT projects.

WE NEED YOU!

The UMS011 Research Unit of the French National Institute of Health and Medical Research (INSERM) and the French Nuclear Safety and Radiation Protection Authority (ASNR) are conducting a joint epidemiological study called ***CORALE*** *(COmposante RadioLogique de l'Exposome). The aim of this study is to assess the exposure to radioactivity since birth of 42,000 volunteers who are members of a larger cohort, the CONSTANCES cohort.*

Assessing lifetime exposure to radioactivity is complex*: some members of the CORALE cohort have sometimes lived outside France, in countries where ambient dose rates are not measured regularly or where the results are not easily accessible.*

The OpenRadiation community is therefore being asked to fill in the missing data, particularly in the following countries: Algeria, Morocco, Tunisia, Ivory Coast, Senegal, Cameroon, Congo, Gabon, Niger, Lebanon, Mali, Mexico, Brazil, and Argentina. It would also be useful to take measurements in territories such as New Caledonia and Mayotte. We already have some results for the French Pacific Islands and French Guiana, thanks to two active contributors in these geographical areas.

What exactly do you need to do if you agree to help us? *Take measurements or ask someone you know to do so when traveling with a compatible sensor, and publish the results on the OpenRadiation map, taking several measurements at different locations and in targeted municipalities whenever possible. This data will be visible on the website and used by the CORALE study team to fill in the missing information about participants who have lived outside mainland France. We can also lend out detectors for a short period, for example when traveling to one of these countries.*

You will soon be able to follow the project on the dedicated section of the OpenRadiation website. Stay tuned!

We are now counting on you to check:

- *that the sensor battery is fully charged,*
- *that your phone has the latest version of the app,*

And then you're ready to take measurements, 1 meter above the ground and preferably outdoors! *Where possible, please take several measurements at different points in each municipality so that reliable averages can be calculated later.*

Contributors'Day : Orléans - 4 and 5 June 2026

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