

A message from the Young Crystallographers' Section

Dear crystallographers, a big thank you. Thank you to all those who read our first issue of Maille, who shared it, commented on it, and who subscribed to continue the adventure with us. To see a small community form around a few pages is, for us, the most beautiful surprise.

But a community cannot be improvised, and ours is part of a much longer history.

It began in 1953, the year in which the French Association of Crystallography (Association Française de Cristallographie, AFC) was born. Seventy-three years later, it remains the place where we meet, whether we have just collected our first diffraction dataset or our thousandth.

If you are not familiar with the association, please allow us to introduce you. The AFC is a learned society that uses a central point of interest, crystals, to pack scientists from different backgrounds (physicists, chemists, biologists, mineralogists, etc.) into one space. An enthusiastic board of directors brings the AFC to life and guides its missions, those of transmitting knowledge, circulating ideas, and forging links between crystallographers here and elsewhere — with the national congress being a prime example of these missions in action.

Different horizons. This is perhaps our greatest wealth, and our crystals are well placed to remind us of this. On the surface, we are all crystallographers, just as a sample is always a crystal. But if we look at the microscopic scale, this is where we see differences. It is by entering into the material, into the discussion, that we see the richness of each aspect. The beauty of our discipline means that every crystal gives information, whether it provides unequivocal information or raises questions because of its patterns, its gaps, or its broken symmetries. While the fact remains that our profession leaves little room for "almost". This attention to accuracy is our strength, but rigor does not need harshness to be effective. A question asked with rigour and benevolence advances a work; whereas a question asked to impress the room, only extinguishes the one who takes the plunge. So, the J-AFC would like to contribute, in a modest way, to making our meetings a place where we dare to present imperfect results, because often, it is only from imperfections that real discussions begin.

It is in this spirit that we imagined this issue. The year 2026 was the year of the AFC congress, and we wanted to make a special edition of it, in honor of the AFC. We will take you to the north of France, to meet those who have made their mark, through their work or their commitment to our discipline. And who knows, we may meet you there in two years, on the other side of the microphone?

While waiting for the big reunion however, there are the little ones. It's time to go back to school! And what if, for a smooth return, you came to share a "coffee" with us at the next Café Solutions, those meetings where we unravel the worries of our daily lives as crystallographers together?

Happy reading, and see you soon!

Crystallographically yours,

The J-AFC

What's New: A Reflection on the 2026 AFC Congress

The **AFC congress** was held from June 30th to July 3rd in Lille. What is the AFC congress? A gathering of 200 people belonging to the various disciplines of the AFC, where crystallography is the common factor.

With its 14 parallel sessions, the 2026 edition highlighted the richness of our community. We had the opportunity to meet people from diverse backgrounds — including scientists working in the field and those in research laboratories — who kindly agreed to take part in a new section project: the "I am a crystallographer" video series.

The AFC congress is also a moment for sharing our problems in the laboratory with rich and passionate/fascinating exchanges. It is an opportunity to meet many experts, to be amazed by what is being achieved in other laboratories, and to spark new ideas you can take back and apply. Attending this congress pushes you to meet other crystallographers and develop a sense of belonging within the community.

Finally, the AFC congress is also about promoting crystallography, whether through the thesis prizes or the André Guinier prize. We will end with the description proposed by the two winners of the André Guinier Prize: *"To introduce the almost in crystallography is to introduce tolerance for two objects considered equivalent of not being quite identical. We therefore propose to qualify this quasi-crystallography as soft crystallography, the subject of our next article."*

See you in Nantes in 2028!



Photo and Logo credits: <https://afc2026.afc.asso.fr/fr/accueil/>

Community Spotlight: Winners of the 2026 AFC Thesis Award

True to our goal of supporting young crystallographers, this section highlights promising researchers and the remarkable work they are doing in the field of crystallography. In this edition, we present the winner of the 2026 AFC Special Thesis Prize — an award conferred biennially by the AFC in recognition of outstanding doctoral research. We spoke with the recipient about his academic background, his thesis topic, and his future plans, and asked if he had any advice for young crystallographers. You can find a more detailed description of his work on the **AFC website**.

Academic Background:

I obtained my master's degree from the University of Strasbourg (2020) and subsequently pursued a PhD in Biophysics at the University of Grenoble Alpes. I defended my thesis in September 2024 under the supervision of Dr. Martin Weik at the Institute of Structural Biology (IBS). My academic path has focused on studying the molecular mechanisms underlying light-controlled biological processes, with a particular interest in the structural dynamics of photosensitive proteins. My doctoral training enabled me to develop expertise in time-resolved structural biology by combining synchrotron-based macromolecular crystallography with time-resolved serial crystallography (TR-SFX). These multidisciplinary approaches allowed me to investigate the activation mechanisms of photosensitive proteins by capturing transient intermediates across various timescales, ranging from nanoseconds to seconds.

Following my PhD, I continued my research as a postdoctoral fellow within the same team, studying additional photosensitive systems to broaden our understanding of photoreception mechanisms. In parallel, I am developing a research line focused on the damage caused by interactions between biological matter and high-energy photons — specifically X-rays — to better understand their impact on protein structure and function.



**Ronald
Rios-Santacruz**

2026 Winner of the Special
Thesis Prize

Thesis Topic:

My thesis, titled "Time-Resolved Crystallography of the CarH Photoreceptor," aimed to understand how a light-sensitive protein converts photon absorption into a functional biological response. My work focused primarily on CarH, a vitamin B12-dependent bacterial photoreceptor that regulates the expression of genes involved in light protection. In the dark, CarH acts as a transcriptional regulator by binding to DNA, whereas exposure to light triggers a cascade of structural changes leading to its activation. The main objective of my thesis was to characterize the entire photochemical and photostructural cascade responsible for this activation, ranging from the initial molecular events to the global conformational changes of the protein. To achieve this, we combined experimental and computational approaches within an international consortium of experts in biophysics, crystallography, spectroscopy, and theoretical chemistry.

Career Plans:

My career prospects build upon my work regarding the dynamics of photosensitive proteins. I aim to continue exploring the molecular mechanisms of photoreception across various biological systems to better understand how the absorption of a light stimulus is converted into structural and functional changes within proteins. In the longer term, I also intend to extend my research on protein dynamics to other biological systems activated by different types of stimuli. My goal is to develop a broader understanding of the relationships between structural dynamics, activation mechanisms, and biological function by combining time-resolved structural biology approaches with complementary biophysical methods.

My advice

Crystallography research can sometimes be long, demanding, and frustrating — particularly when experiments fail to yield expected results or progress seems slower than anticipated. However, I am convinced that it is always possible to rediscover enjoyment and motivation in one's research project. This sometimes requires exploring new avenues, communicating with supervisors and colleagues, seeking out fresh approaches, and, above all, not hesitating to think outside the box. A PhD is a unique experience that belongs to you; it is important to make the most of it and forge your own scientific path. Fear of failure can sometimes narrow our vision and prevent us from envisioning the future possibilities of our project. At such times, I believe it is essential to focus on the present: What is the next possible step? Which approach might move the project forward? How can a challenge be turned into a new opportunity?

I would also advise young researchers to take an active role in their work: attend conferences, visit major research facilities, interact with other teams, conduct their own experiments whenever possible, analyze their own data, and develop their own scientific understanding before discussing it with their supervisors. These steps help build autonomy and confidence while fostering a genuine identity as a researcher.

Finally, I believe it is important to maintain one's scientific curiosity and take the time to appreciate the progress made. Research can be challenging, but the discoveries and insights that emerge from those difficulties often prove to be the most rewarding moments of a scientific career.

Interview: Testimony from a former AFC president

« For this special AFC issue, we met with Claude Sauter, a former president of the AFC who oversaw the creation of the Youth section during his leadership. »



Claude Sauter

CNRS Director of Research at the Institute of Molecular and Cellular Biology (IBMC), RNA Architecture and Reactivity (ARN) unit in Strasbourg. Former president of the AFC

How long have you been a member of this association (AFC) and what does it bring to your daily life?

I joined the AFC during my thesis at the conference organized in Orléans in 1998. As a biochemist, I was already a member of the French Society of Biochemistry and Molecular Biology (Société Française de Biochimie et Biologie Moléculaire, SFBBM). Joining the AFC allowed me to meet experienced crystallographers, to exchange with them, and learn from them, whether at national and international congresses or at the synchrotron. Thanks to the activities offered by the AFC, I was able to build my own expertise in crystallography and create a network of collaborators and friends, sharing the same passion for the exploration of molecular objects and for the most unlikely late-night experiments at the synchrotron.

You were president of the AFC during the last term. What were your motivations for accepting this role?

Traditionally, the AFC's presidency rotates between its three thematic groups. In 2022, it was the turn of the biology group and several colleagues on the AFC board approached me. I would not have been a spontaneous candidate, but the desire to continue the projects started during the previous board's mandate, to promote new ones, and the assurance of the support of the other board members, were driving forces behind my commitment.

If you had to convince a young crystallographer to become a member of the AFC, what would be your arguments?

Joining the AFC as a young crystallographer means joining a group of passionate and multidisciplinary scientists, developing your professional network and making your research known, keeping up to date with crystallographic news (congresses, training, job offers), and also being able to benefit from financial support to participate in national and international congresses. Can we even resist such an offer???

Crystallography is a discipline at the interface of biology, chemistry and physics. What would you say to young researchers who may sometimes feel that their training or their field of study makes them less legitimate than others in this discipline?

I am a biochemist and biophysicist, so multidisciplinaryity is a daily reality and a source of inspiration. This is what I like about crystallography, a discipline that is both rich and varied, but also solid and structured. Of course, you can't be a specialist in everything, but as soon as you are interested in the molecular world, materials and experimental approaches make it possible to probe matter, and it is because "we (all) have something of crystallography in us". So, get involved, recommit yourself and the AFC will be what its members make of it!

Recommended Reading: A Publication for Everyone

We all know how painful it can be trawling through literature to find an article on a specific concept, so we thought we would help a little by asking an experienced crystallographer to recommend an important publication that will improve your crystallographic knowledge.

For this second issue, **Pierre Legrand** — a beamline scientist at the SOLEIL synchrotron and **Antoine Royant** — a CNRS Research Director and head of the synchrotron group at the Institute of Structural Biology, Grenoble, share a key reference with us.

Macromolecular Crystallography

Pavel V. Afonine, Armando Albert, Kay Diederichs, Juan A. Hermoso, Eugene Krissinel, José Antonio Márquez, Santosh Panjikar, Maria Solà, Andrea Thorn and Isabel Usón — Nature Reviews Methods Primers (2025).

This article is an essential reference for the new generation of MXgraph users, providing a strong introduction to the field of macromolecular crystallography while taking into account the major changes of the last decade.

● [Access the publication here.](#)

Café Solutions

To wrap up the year, we have prepared a special program for you: a three-part session dedicated to the analysis of powder diffraction patterns using the FullProf Suite, presented by **Thierry Roisnel** from the Institute of Chemical Sciences of Rennes (Institut des Sciences Chimiques de Rennes, ISCR).

The agenda includes a general overview of powder diffraction patterns and the key software within the FullProf Suite. The session will focus on the analysis of diffraction profiles and the mathematical functions used to describe them, while also covering Profile Matching and Rietveld refinements. Microstructural analysis and its implementation in FullProf will also be presented, followed by a detailed look at numerous examples. Finally, other topics may be covered, such as quantitative analysis, the use of constraints during refinements, or the indexing of a powder pattern.

Join us on **November 19th**, **November 26th**, and **December 3rd** for this three-part series. We would like to thank Thierry for accepting our invitation.

Do you have a topic you'd like us to cover in Café Solutions? Or are you an expert crystallographer that enjoys sharing your knowledge with younger generations? Please contact us! We love to receive suggestions for future Café Solutions topics so that we can help the community where it is needed in a friendly and supportive environment!

Notable Dates & Useful Links

Join the community of young crystallographers by clicking the [links](#) below! Visit our **website** or sign up to our **mailing list** to stay abreast of upcoming events and recent news in the crystallographic space. Got ideas for future content or need help solving a tough structure? Contact us via **email**! Or better yet, join our online community forum — **Framateam** — where you can meet other passionate crystallographers who are happy to help solve problems!

● [Our Website](#) ● ● [Mailing List](#) ● ● [Email Us](#) ● ● [Framateam](#) ●

Other Relevant Links

- [Job vacancies & events](#) — Crystallography roles and events in France and Europe as listed on the AFC website.
- [Conference Internationale Matériaux 2026](#) — Come meet Elen & Léon at the International Materials Conference in Grenoble!

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