

N°2

Saturday, July 19TH

—PHYSICS—

BEYOND FRONTIERS



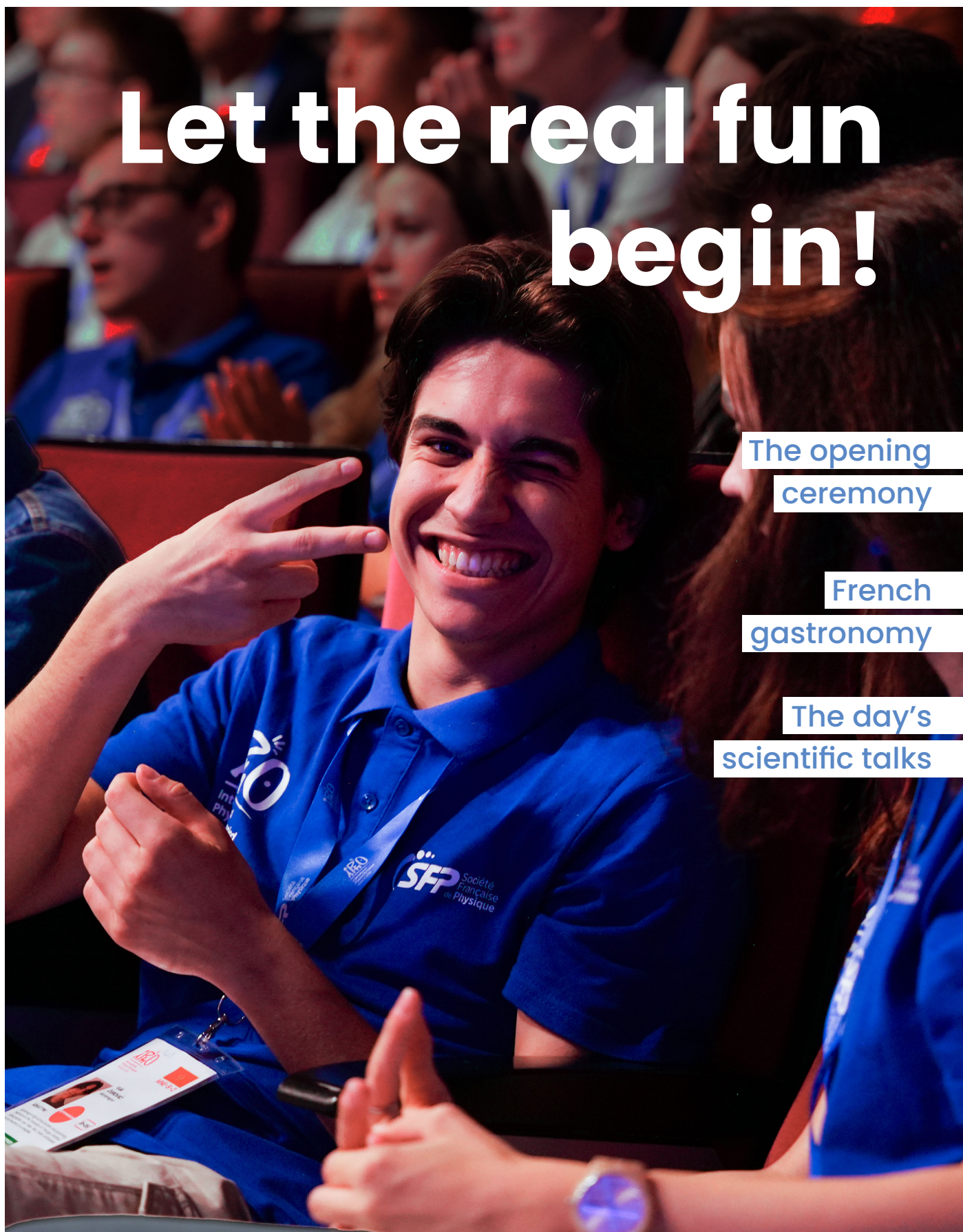
International
Physics Olympiad
FRANCE 2025

Let the real fun begin!

The opening
ceremony

French
gastronomy

The day's
scientific talks





Dear participants of the International Physics Olympiad,

Physics is an endless source of curiosity, wonder, and joy. During this Olympiad, you will dive deep into this rich world, and I hope you take great pleasure in doing so.

But physics is more than just a source of intellectual delight—it is a powerful tool to understand and shape the world around us, a world full of challenges and complexity. Today, and tomorrow, these challenges are enormous. One of the most pressing is the ecological and energy transition, which also carries profound implications for social justice—how can we ensure a habitable planet for all?

The building and construction sector is a key focus area for this transition. Today, it accounts for 40% of global CO₂ emissions. As scientific director, I am fortunate to coordinate advanced research programs at Saint-Gobain Research Paris (SGR), where we are working to make buildings more sustainable.

Did you know that developing low-carbon, sustainable cementitious materials requires us to understand the poromechanical behavior of materials at the nanoscale? Or that the thermal insulation properties of glazing can be dramatically improved by just a few nanometers of silver coating, and further enhanced with laser treatments? These are just some of the fascinating problems that physicists at our research center work on every day.

As you can see, your physics skills, your passion, your curiosity, your drive to push boundaries, will be invaluable in tackling the world's challenges.

These Olympiads are also a celebration of teamwork and collaboration. While school often emphasizes individual achievement, real-world progress is always the result of collective effort. Here, you'll meet teams from around the globe—competitors, yes, but also peers to learn from and respect. This spirit of openness and diversity is not just a value for the competition—it's a cornerstone of the future we must build together.

At Saint-Gobain Research Paris, we're proud to have researchers from 35 different nationalities, bringing together expertise from physics, chemistry, mathematics, mechanics, biology, and social sciences. Scientific progress happens when disciplines collaborate, and I'm confident that your curiosity—both within physics and beyond—will help you build bridges that lead to new discoveries.

I wish you all an inspiring and unforgettable experience at the International Physics Olympiad!

Emmanuelle Guillard

Scientific director, Saint-Gobain Research Paris



YESTERDAY'S HIGHLIGHTS

The opening ceremony



The grand opening ceremony of the 55th International Physics Olympiad set the tone for what promises to be a week full of discoveries, encounters, and unforgettable memories. From the very first moment, the atmosphere was vibrant, playful, and animated by Anatole Chouard, the master of ceremonies and who is also a French science YouTuber.

The event began on a light note - quite literally - with a French mime who captivated the audience through a humorous and poetic performance. Without uttering a single word, he managed to win smiles from every corner of the room. Then entered the host for the evening, Anatole Chouard, who masterfully led everyone through the ceremony with wit and clarity.

The official handover of the IPhO flag from Iran to France marked the symbolic beginning of this new competition. Dominique Obert and Pierre Chavel, the two IPhO France 2025 Committee co-chairs, took part in this transition, highlighting the deep significance of this international tradition.

Throughout the evening, everyone was welcomed warmly by key figures of French science and education. Delphine Samsoen, acting Chairperson, and CEO of Universcience initiated the first official speech. She shared heartfelt words about the importance of joy and passion for science. These were endearing words about the Cité des sciences et de l'industrie, which welcomed everyone that day. Close bonds make science accessible for everyone. She reminded us that Cité des sciences et de l'industrie is open to students and researchers. Elisabeth Giacobino, President of the French Physical Society, joined the organizers in celebrating the arrival of participants. She also presented

the international exhibition specially designed by the French Physical Society for the occasion of IPhO - France 2025: 'Women pioneers in physics'. This artistic and educational exhibition has 20 notable women and celebrates women in science from all continents, through different eras.

This exposition is available in English and French, and is to be widely shared. Prof. Rajdeep Singh Rawat, President of the IPhO International Board, reflected on the year's slogan - 'Physics beyond frontiers', which encourages each competitor to harness their full potential, not just to achieve personal excellence, but also share discoveries and collaborate across borders. Finally, Philippe Baptiste, Minister in charge of Higher Education and Research, associate to Elisabeth Borne, Minister of state, Minister of National Education, Higher Education and Research, reminded that France and Europe are great places to study science, and students and researchers are welcome here. He also raised awareness of gender equality, a subject to which France pays a great deal of attention. There are 10% girls in this year's IPhO, which is an improvement. The saying, 'bravo but we can do better', states that we must make this competition a turning point for our female physicists.



In the ceremony, Anatole asked, "Who among you knows the Macarena by heart? All the lyrics? The artist?" He used this catchy tune as a brilliant metaphor. Even things that seem simple or familiar often hide surprising complexity beneath the surface. Just like physics!

After the lights dimmed, everyone was treated to a beautiful live performance by the Plateau de Saclay Orchestra. Their renditions of 'Carmen' and the iconic 'French cancan' immersed the amphitheater in musical energy, echoing the cultural richness of the host country.

Then came an illuminating keynote by the Physics Nobel Laureate, Serge Haroche in a very encouraging talk on the quest to understand all the mysteries of Light. He demonstrated the unique role of the increased precision of the various instruments used over the last 4 centuries to uncover fundamental and unexpected phenomena. The same curiosity and passion that have inspired Huygens and Newton is still the driving force for the people developing the fantastic precision of today's optimal clocks that may give clues on how to link quantum physics and gravity.

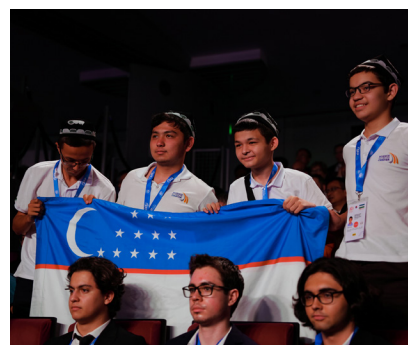
We also celebrated the next generation of science communicators: the winners of the French high school video contest, 'Two minutes of physics', Ulysse Devalland and Elliot Collet (10th grade). They received not only gifts but also enthusiastic applause for their very imaginative and qualitative project, 'Pressure on the eardrum', and we hope that they will continue to make more!

In a colourful moment of international unity, each delegation proudly presented itself on stage, before the room witnessed a mesmerizing dance performance by the Duo 2G. Their choreography blended precision and emotion, much like physics itself.

The ceremony also reminded us of another major global event recently hosted in Paris, the 2024 Olympic Games. A stirring orchestral segment drew a symbolic parallel between athletes and physicists, 'This time, you are the competitors, your minds are your tools, and your discoveries will echo across borders.'

Finally, the Garde Républicaine, France's emblematic ceremonial military band, closed the evening to a symbolic and festive close, marking the start of what will surely be a unique and unforgettable IPhO ceremony.

Let the IPhO adventures begin!



First glimpses of IPhO 2025: what students loved most

Anas Ramy Nabil
Abdelkader from Qatar

“I’ve been to some Olympiads before, and honestly, this was the best ceremony I’ve ever attended. The music part was amazing, and the presenter was really relaxed and charismatic. He’s honestly a great host. We’re really looking forward to seeing him again at the closing ceremony.

The music performance was incredible, we truly enjoyed it. And it was also great to learn something new about physics when the Nobel Laureate, Dr. Serge Haroche came and gave us a quick lesson on electromagnetism and some quantum mechanics, it was fascinating!

Eiman from Pakistan

“I really, really enjoyed the opening ceremony, especially the music by the French Royal Guard, the ballet show, and the mime. It was amazing! And the social experiments were absolutely crazy.”

Tiago from Portugal

“Olá, my name is Tiago. I’m 18 years old and I’m from Portugal.

I really enjoyed the opening ceremony. The moment I liked the most during the opening ceremony was the musical performance.”



A productive afternoon at the Science Museum

Some might’ve thought that after a tiring journey from their distant home country to Paris and experiencing the thrill of the exciting Opening Ceremony, and a very good cocktail, the International Physics Olympiad students would take a walk of leisure in the magnificent Science Museum of la Cité des Sciences et de l’Industrie to rest and have fun together. But obviously, it is not what happened. IPhO students could only think of their first exam tomorrow and they all wanted to prepare hard.



Many were seen rushing to the ‘Brain’ section, hoping that if they could learn somewhat more on how it works, this would immediately enhance their chance of winning a gold medal. Not a bad plan, after all! Some students, who (we suspect were introverts) are usually told not to behave like robots went to the Robotics section to perhaps know better what not to do. But, when they saw the precision, agility, endurance, and efficiency capacities of these machines, perhaps raised a doubt; that maybe, they should behave exactly like this for the rest of the week!

For some, the visit to the ‘Sténopé’ section (how artists develop techniques to make 3D views in different ways) was the best in order to enhance their performance. They now see the Olympiad from a different perspective! Others have learned that in French, Physics and physical activities are described by the same word: *physique*.



They trained to run like a dog or jump like a cat (the ‘Cats and Dogs’ exhibition is a hit in the museum), just in case the Academic committee mistakenly took the other sense of the word ‘physique’ when preparing the subject of the exam. But where they all met was of course in the Space section. All these fantastic students are now shooting for the moon and are hoping to become stars. International Physics Olympiad stars, of course!



Celebrations around the year in France

First Sunday in January: Epiphany or Feast of the Three Kings (the Magi who came to Bethlehem from the Orient). We eat a galette filled with frangipane or almond cream.

February 2 (40 days after Christmas): Chandeleur, pancakes.

February 14: Valentine's Day, the celebration of lovers, with chocolates in red heart-shaped boxes.

On **April 1st**, we play jokes or glue paper fish to our backs.

May 1st is Lily of the Valley Day, when we offer a sprig of lily of the valley for good luck.

June 21, the day of the summer solstice, is the Fête de la Musique, with orchestras and choirs in towns and villages.

July 14 is the national holiday: in the evening, there are balls in the streets and fireworks displays organized by the local authorities or the fire department.

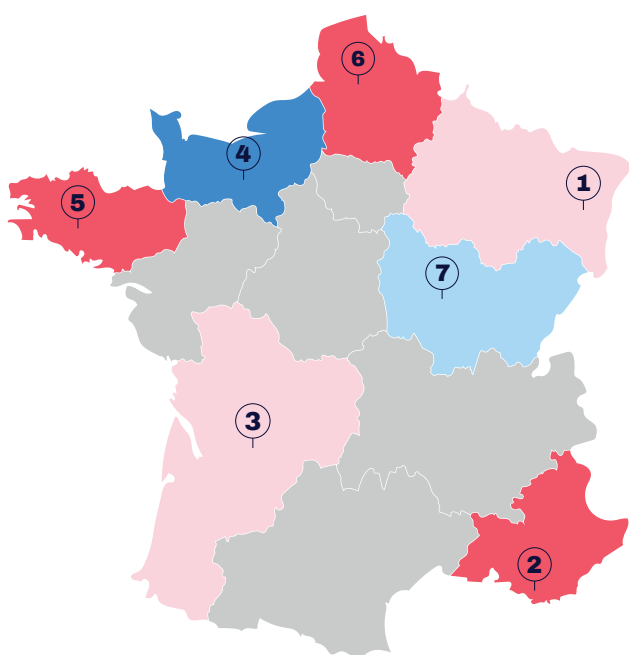
August: month of summer vacations. The French "migrate" south.

Early September: back-to-school season.

November 1st: cemeteries are decorated with flowers.

Christmas is celebrated on **December 25**. Christmas trees decorate homes. Children receive presents. We eat a cake (or ice cream) in the shape of a log, often chocolate.

French gastronomy or «food and wine»



France is famous for its gastronomy and wines. Each region of France has its own specialties.

- ① Alsace's specialty is sauerkraut served with white wine.
- ② In Marseille, on the Mediterranean coast, you may be served bouillabaisse, a fish soup.
- ③ Périgord (southwest France) is famous for its goose or duck foie gras.
- ④ You won't leave Normandy without tasting its famous camembert cheeses, made from cow's milk.
- ⑤ In Brittany, you can choose sweet or savoury galettes accompanied by cidre (lightly alcoholic, sparkling apple juice).
- ⑥ In the north, you may opt for a plate of frites.
- ⑦ Finally, in Burgundy, you can give snails a try.

The day's scientific talks



4:00PM-4:30PM: Vincent Brion - amphithéâtre Poincaré de l'École polytechnique

"Human Flight - Facts & Threats, from a biomimetics perspective"

Vincent Brion is a research engineer at ONERA, where he works in the field of aerodynamics. His research focuses on aircraft wake dynamics and their impact on climate. Vincent Brion is also passionate about shock wave phenomena in transonic and supersonic flows, and flow control issues. He is also in charge of the wind tunnel team at ONERA Meudon, which is one of ONERA's research centers in the Ile-de-France region, and where we have top-level research equipment, in particular wind tunnels capable of handling high-speed civil and military aviation applications. He is also active in teaching, holding the position of Assistant Professor in the Mechanics Department at the École Polytechnique.



4:30PM-5:00PM: Sylvie Richard - amphithéâtre Poincaré de l'École polytechnique

"Net zero, How can nuclear combat climate change ?"

Sylvie RICHARD is Director of Programs and Strategy Division at EDF. She began her career in 1996 at EDF and held various positions in engineering and nuclear production until taking over the management of the Tricastin nuclear power plant (4 reactors of 900 Mwe) in 2013. She is currently Director of the Programs and Strategy Division, in charge of programs to prepare for the future of EDF's production fleet (Long Term Operation of nuclear power plants, climate adaptation, etc.) and CSR.

She is a member of the supervisory boards of Framatome as well as the board of directors of Renaissance Fusion and the Agir pour l'Emploi Fund. She is deeply committed to promoting diversity and women's career paths in the industry and took the presidency of the EDF Gender Network in June 2024.

Sylvie RICHARD is an engineer graduated from ENSTA PARIS, and holds an Executive MBA from IMD Lausanne.



5:00PM - 5:30PM: Pierre-Olivier Lagage - amphithéâtre Poincaré de l'École polytechnique

"Exploring Exoplanets with JWST: Unveiling Distant Worlds"

Pierre-Olivier Lagage is an astrophysicist, director of research at CEA. He has led the French contribution to the James Webb Space Telescope, the Flagship mission of NASA.

He is co-author of more than 400 publications, including 17 publications in the Journal 'Nature'.



5:30PM - 6:00PM: Emmanuelle Guillard - amphithéâtre Poincaré de l'École polytechnique

"The Physics of sustainable glass"

Emmanuelle Guillard is Scientific director of Saint-Gobain Research Paris, in charge of upstream programs and academic collaborations, that help shape the future of materials science.

She earned her Master's degree in Theoretical Physics in 2004 from the prestigious École Normale Supérieure in Paris. She went on to complete a PhD in Fluid mechanics in 2007, jointly supervised by Sorbonne Université and Imperial College London.

From 2008 to 2019, she was part of a joint research unit between CNRS and Saint-Gobain, where she focused on transport phenomena in molten glass. She became director of the lab in 2013, leading projects at the interface of fundamental physics and materials engineering.



MEXICO



QATAR



PHILIPPINES



AUSTRALIA



CYPRUS



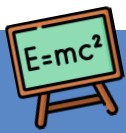
DENMARK



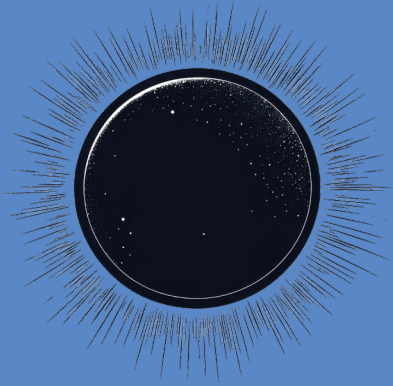
ESTONIA



GREECE



Physics on this day



JULY 19, 418

Solar eclipse accompanied by virulent drought.

According to the Greek historian Philostorge (368-433), this eclipse was «so complete that the stars were seen as if in the middle of the night, at two o'clock in the afternoon. It produced a heat that killed many men and cattle». This eclipse, visible not only in Constantinople but also in France, was used in the 17th century to date the rule of the Merovingian monarch Pharamond, supposedly the first king of the French.



Schedule

Saturday, July 19



Student

9:00AM – 2:00PM: Experimental exam

4:00PM – 6:00PM: Conferences



Leaders & observers

10:00AM – 5:30PM: Visit - Château de Versailles



The quirky pic' of yesterday



Nap at the planetarium!

Free copy, published by the French Physical Society.

Photo credits : p.1 : Manon Lemahieu - Ocelot Productions, p.2: Laurent Guichardon, p.3 et 4 : Manon Lemahieu - Ocelot Productions, p.4 : Lucie B., p.7 : Diaraye Bah

Editor-in-chief : Mayline Verguin

Editorial team: Sylvie Dancre, Sophie Remy, Catherine Velay

Contributors: Jean-Marie Brom, Anaïs Guicciardi, Asira Lele, Léonore Leroy, Halima Wagnon-Makita, Guy Wormser

Design & layout : Lea Lebaillif

Printed by 75print.fr