

Interdisciplinary School 2023

Report



Society for Multidisciplinary
and Fundamental Research

Interdisciplinary School 2023 Report

Overview

The Interdisciplinary School 2023 was organized in Valencia (Spain) from July 24 to 28, 2023. 29 speakers offered courses and talks on fundamental and multidisciplinary topics in fields such as biology, computation, scientific practice, mathematics, literature, thermodynamics, the relationship between science and art, music, the neuroscience of psychedelics and philosophy.

The school, open to international participants and free of charge to attend, was held at the Polytechnic University of Valencia with the support of the Pure and Applied Mathematics University Research Institute. Among its speakers there were internationally renowned experts such as Michael Levin, Stephen Wolfram, David Spivak or Julian Barbour.

The event brought together more than 300 people from 43 different countries, of which 120 attended in person. In addition to the scientific content of the event, there were several social and artistic activities such as a music workshop, a beach party, an orxata tasting experience or several get-togethers and dinners. There was as well as a previous week of online pre-school.

Throughout the school, online discussion spaces were enabled on SEMF's Discord server, and the sessions were broadcast live on the SEMF YouTube channel. All information on the event was available and updated in real time on a dedicated website: <https://semf.org.es/school2023/>

Organization

The event **organizing team** was Carlos Zapata-Carratalá and Álvaro Moreno-Vallori.

The event was **supported** by professor Alfred Peris-Manguillot (Pure and Applied Mathematics University Research Institute, IUMPA), who mediated an agreement with the Technical University of Valencia by which 3 classrooms were provided at no cost and participants gained access to discounted on-site accommodation.

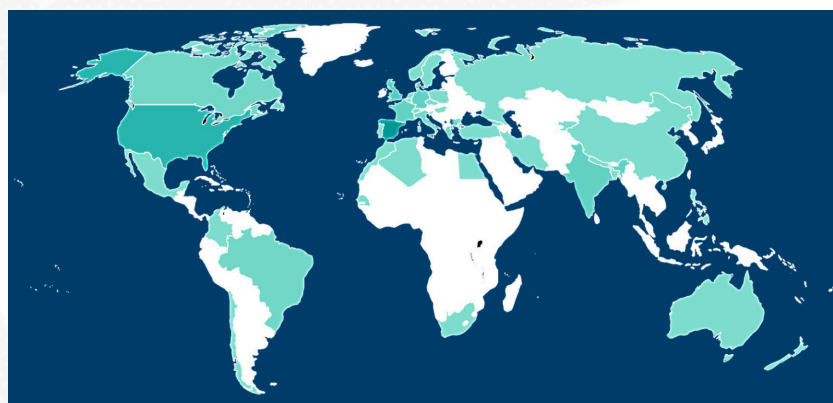
The event operated with **no funding**. Participants registered free of charge and paid for the cost of their travel, accommodation and expenses.

Participants

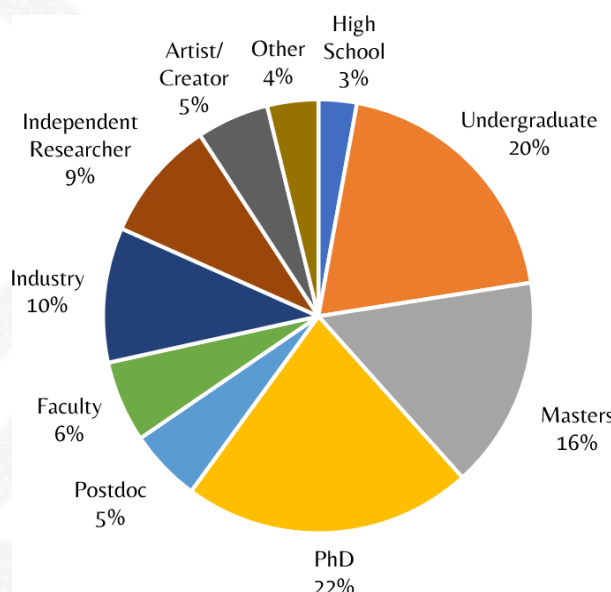
A total of **305 people** attended the event. **120 attended in person** in Valencia, of which **45 stayed in accommodation** arranged by the organization.

Participant **affiliations** spanned more than 100 world class universities and research centres including: MIT, UCLA, University of Oxford, Imperial College London, University College London, ETH Zurich, Santa Fe Institute, University of Pennsylvania, Max Planck Institute, University of Edinburgh, Johns Hopkins University, McGill University, Northwestern University, University of British Columbia, Technical University of Munich, CSIC... Affiliations included as well several companies, foundations, collectives and other organizations, such as IBM, Wolfram Research, Mozilla, Champalimaud Foundation, Ars Scientia, Conexus AI...

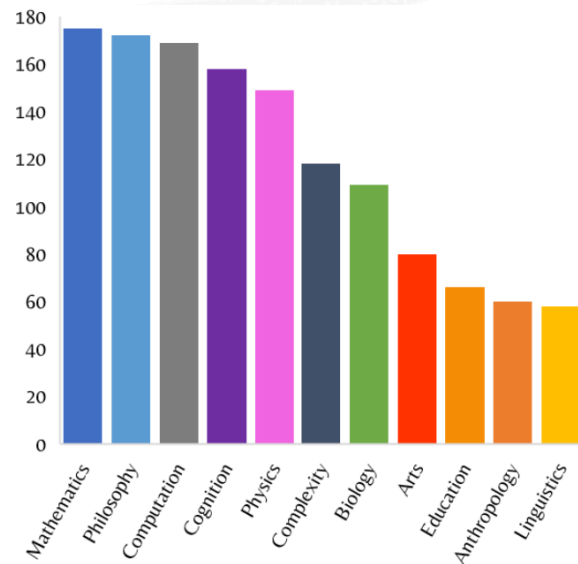
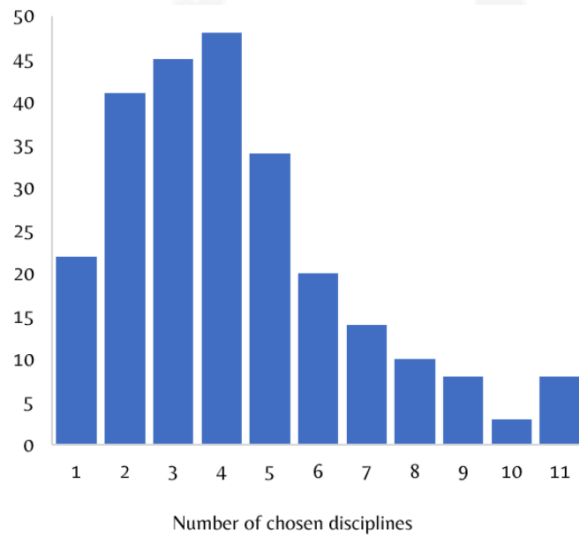
Participants spanned **43 countries**, covering several time zones, with Spain (92), USA (45), UK (28), India (19), France (12) and Germany (11) representing more than $\frac{2}{3}$ of the attendance:



This was the distribution of **participant backgrounds**:



In the registration form, participants were asked what disciplines better represented their interests, studies, research activity or work. From this **disciplinary data** two plots were made, showing interdisciplinary depth (the number of disciplines selected per participant) and disciplinary representation (the number of times a discipline was selected by participants):



Speakers

A **total of 29 speakers** took part in the event. 16 of them attended in person and 13 offered online contributions. They consisted of 16 young researchers, 5 professors, 2 independent senior researchers, and 6 industry professionals, including a CEO and a CTO.

Their **affiliations** included MIT, University of Oxford, University of Edinburgh, Santa Fe Institute, ETH Zurich, University College London, Wolfram Research...

Activities and Contents

Here are some of the contents covered in the activities separated according to the format of the contributions. The detailed contents of each activity can be found at the event website: <https://semf.org.es/school2023/sessions.html>

Courses

Foundations of mathematics and hypergraph theory, biological evolution through cognition and computation, literary aspects of mathematics, rationality and emotions in science, type theory, art and science, category theory and computation applied to the study of causality...

Talks

Basal cognition and regenerative medicine, entropy and energy, neuroscience and philosophy of psychedelics, music visualization, thermodynamics of computation, spatial cognition, applied category theory, art and science, the industry-academia gap, entropy and gravity, software design, scientific basis of meditation, category theory applied to databases in industry, comparative philosophy, computational neuroscience, quantum field theory...

Debates and Workshops

Philosophy of scientific practice, meditation, aesthetics in science and artistic practice.

Art and Music Creation

Keyboard improvisations, drum machine and electronic music production, classical and jazz clarinet and violin, real-time sound visualization software, folk dance...

Event Design

From the beginning, the Interdisciplinary School was envisioned as an **experience** for students, researchers and creators of all backgrounds and educational levels to learn about a wide range of topics, exploring many traditionally distant disciplines while socializing with like-minded peers in a dynamic and creative environment.

The **scientific and academic contents** of the school were articulated around five thematic tracks: multidisciplinary mathematics, systems science, minds and neurons, entropy, and philosophy of practice. Leading figures related to these areas were then invited to be voluntary speakers. The selection of the specific subject of their contributions was the result of ongoing one-on-one conversations with each of the speakers, who were offered flexibility both in the format and the contents, as well as guidance on the topics, approaches and pitch levels that could best fit with the expected audience and SEMF's vision.

In addition to the contributions presented by the invited speakers, several activities were organized throughout the week for participants to engage with **different modes of creation and interaction**, particularly in ways that transcend typical classroom dynamics. An important way to incentivize this aspect was the **Art Jam Session**, scheduled towards the end of the week as an evening event with a strong social component. A drawing room and a music practice room were made available to participants during the week to prepare their contributions, collaboration was encouraged. A series of **physical practices**, such as guided meditations, stretching exercises in the morning, beach games and dancing, were also included as part of some of the activities or were spontaneously arranged during breaks and downtime.

Lastly, a key aspect of the Interdisciplinary School design is **social cross-pollination**: we aim for all participants, speakers, organizers and attendees alike, to mingle and coexist in a horizontal open-minded environment regardless of their seniority, education level or disciplinary background. Several social activities were prepared towards this end, specifically: dinners and drinks in the evenings, a beach party with fresh foods and beverages provided by the organization, a trip to a local orchard and ice cream shop for a tasting experience...

Speaker Statements

“I was especially impressed by the authentic desire of the organizers and participants to find new paths and connect old ones in new ways, and by their determination to find clarity in communicating about difficult subjects [...]. There was a sense of inclusivity and openness that made participants feel they could discuss matters together without having to be an expert in the topic at hand. Likewise, experts could feel comfortable learning from new perspectives outside their field”

Andrea Hiott, in-person speaker

“I had a great time as both a speaker and a participant at the summer school. The participants were inquisitive, diverse, and precocious; remote participation went off without a hitch; and there is a lively online community still discussing the ideas. I highly recommend it to anyone looking to work technically at the intersection of scientific fields”

Ryan Wisnesky, online speaker

“The talks and discussions at the School seamlessly transcended disciplinary – and all the other – barriers [...]. The participants of the school, students, young researchers, and artists, were wonderful listeners, curious inquirers, and passionate debaters. Beyond that, I really enjoyed how the School was structured as a whole. It nicely combined intense intellectual content during the day with a social activities programme in the afternoon. With this, many discussions carried over from the auditorium to more informal settings”

Anatolii Kozlov, in-person speaker

“The whole week was extremely well organized. [...] I got exposed to a broad range of subjects from the speakers, but also from other participants during informal discussions. I often felt like discovering really interesting and far-reaching pieces of knowledge that I should have known before, but they were just too far away from my professional field of research. Aiming to broaden my horizons, this week was absolutely well invested”

Václav Zatloukal, in-person speaker

“Really appreciate the opportunity to talk to all of you, amazing interdisciplinary group here”

Michael Levin, online speaker

“It would be fun to be there in person, but not something that's logistically possible right now”

Stephen Wolfram, online speaker

Attendant Statements

“It was a precious experience. Thank you for creating such a beautiful environment!”

Pinar Temiz, in-person participant

“Not sure I'm ready to return to non SEMF life, probably the most incredible week of my life to date”

Lucy Spouncer, in-person participant

“I am so very grateful for the memories of this week. To me it was the perfect balance of brain work and socials; and I am more than grateful for everything I learned from all of you! This crowd consists of very inspiring minds and the sense of connection made this a very unique experience!”

Merle Praum, in-person participant

“Never have I seen someone doing so much with so little infrastructure and fundings. Truly amazing job”

Anonymous, post-event survey

“I think you guys did a stellar job and I still can't comprehend how you did all that without a team of 15 people in the background”

Anonymous, post-event survey

“This was an incredible event. I am so so so grateful to have attended and genuinely impressed by the high quality of the organisation. Many thanks for all of your amazing work! Excited for the next editions”

Anonymous, post-event survey