Hard Sciences: exploration of special topics in Physics, Mathematics, and Computing

Blended Intensive Programme
"Alexandru Ioan Cuza" University, Iași, Romania

Call for partners

What is it about?

Alexandru Ioan Cuza University of Iași offers this module to students from all over the world, who share an interest and passion for science and technology. This course pack is designed to enrich your theoretical knowledge and practical abilities in Hard Sciences, to broaden and improve your experimental skills, data processing and reporting capacity. You will be able to tap into a variety of topics, such as: artificial intelligence models and machine learning, mathematics, numerical simulations in physics, high energy physics, as well your very own first-hand experience in molecular spectroscopy, cryptography or sky map reading.

Where?

"Alexandru Ioan Cuza" University of Iasi, Romania

When?

13 – 19 July 2026

Who should attend?

The program is designed for students (Bachelor, Master, or PhD) who are interested in science and technology.

Learning outcomes

Participants will develop a solid understanding of numerical simulations in physics, plasma physics, and chaos theory. They will gain hands-on experience in high-energy particle physics, diatomic molecular spectra, and machine learning. Additionally, they will explore mathematical models in life sciences, cryptography, and AI in games, while learning about microstructure-function relationships in materials, probability theory, and scientific communication.

Benefits

4 ECTS Credits

Course structure. Main topics

During this period, participants will engage in lectures and interactive discussions on key themes, including:

- Numerical simulations in physics (L)
- Hands on High Energy Particle Physics (W)
- Introduction to plasma physics (W)
- Chaos and self-organization (L)
- Diatomic molecular spectra (W)
- The correlation between microstructure and functional properties in materials for microelectronics (L)
- Basic optimization algorithms which cannot exist without “a little bit of math” (W)
- Mathematical models in Life Sciences (L)
- Applications of Probability Theory (L)
- Astronomy & sky map reading (L + W)
- Basic mathematical structures used in cryptography (L)
- Introduction to Cryptography and Internet of Things (IoT) (W)
- Artificial Intelligence in Computer Games (L)
- Artificial Intelligence: what it really is and how it really works (L)
- A hands-on experience in machine learning (W)
- Introduction to Mixed Realities (L)
- Communicating science: delivering clear and interesting scientific information (W)

The program will also include a guided tour of the city, a welcome reception and a closing cocktail, a one-day trip and many other interesting activities.