



EU-MATHS-IN Finland

Plan for 2025

The Finnish National Network on Mathematical Modelling is formed by the following Finnish universities and their departments.

- Lappeenranta-Lahti University of Technology (LUT), School of Engineering Science
- Tampere University (TAU), Faculty of Information Technology and Communication Sciences, Unit of Computing Sciences
- University of Eastern Finland (UEF), Department of Technical Physics (Kuopio)
- University of Eastern Finland (UEF), Department of Physics and Mathematics, (Joensuu)
- University of Jyväskylä (JYU), Faculty of Information Technology
- University of Oulu (OU), Faculty of Natural Sciences, Department of Mathematical Sciences
- University of Helsinki (UH), Department of Mathematics and Statistics

The units/ departments share their interest and experience in mathematical modelling in order to develop and use mathematical methodology to solve important problems in science, economics and industry. The main activities of the network consist of modelling, simulation, collaboration with industry and society, in terms of projects, modelling weeks, modelling education and study groups.

The Network is associated with the Finnish Centre of Excellence in Inverse Modelling and Imaging supported by Academy of Finland with Aalto University (AU), Finnish Meteorological Institute (FMI), Lappeenranta-Lahti University of Technology (LUT), Tampere University (TAU), University of Eastern Finland (UEF), University of Helsinki (UH), University of Jyväskylä (JYU), University of Oulu (OU).

Flagship of Advanced Mathematics

Flagship of Advanced Mathematics for Sensing, Imaging and Modelling (FAME) is a multidisciplinary consortium of eight academic partners harnessing applied mathematics and physics for the benefit of the society.

It is based on scientific excellence on applied inverse problems research in Finland. In FAME we will collaborate with stakeholders in industry and society to promote Finnish economy and global wellness. In the Industrial Collaboration impact theme of FAME, we will work with industry through joint projects, seminars, meetings, and various workshops. The goal is to transfer knowledge on sensing, imaging, and modelling from academia to industrial applications.

The FAME Flagship closely co-operates with the Doctoral Education Pilot for Mathematics of Sensing, Imaging and Modelling (DREAM), which is part of the Finnish Government's initiative to train 1000 new doctors. In DREAM, the total of 100 doctoral researcher positions are placed across the FAME Flagship's seven partner universities.

DREAM is dedicated to training experts in developing methodologies essential for many industrial and societal applications. The pilot provides a systematic form for doctoral training and collaboration with industry and society, working in close collaboration with the companies and other societal actors partnering with the FAME Flagship.

One of the aims of DREAM is to provide high-quality scientific and industry-driven training through outstanding individual doctoral candidates' research projects complemented with several network-wide courses. Other aims are to bring novel technologies and mathematical innovations into productive industrial environments and to maintain active connections with actors in industry and public sector throughout doctoral studies to enable smooth transition from academia to other parts of society after dissertation.

In February 2025 Teknologiateollisuus Ry organises Industry Connect event in Tampere for DREAM and Intelligent Work Machines doctoral education pilots. The aim of the event is to bring the students of the two pilots and Finnish technology companies together and help networking. Also the supervisors of the student and other students from FAME are welcome to the event.

In August 2025 FAME organises one major Connect and Collaborate event in Aalto-University, where companies and other organisations can meet and network with researchers of FAME. The event has three days such that the first day concentrates on remote sensing and geospatial solutions, the second day on mathematics for industrial modelling, simulation and optimisation, and the third day on medical imaging and technology.

Education: Finnish Applied Mathematics Network

In the fall of 2024, the network agreement for teaching in collaboration was updated, and the courses in Mathematical Modelling will be part of the Applied Mathematics Network. The network includes Tampere University (coordinator), University of Eastern Finland, University of Jyväskylä, LUT University, University of Oulu, and Åbo Akademi. Degree students from the universities involved in the network can apply for the network's courses. During the fall 2025 the network organises teaching of the "Basic Course on Mathematical Modelling" both in Finnish and English. The courses were taught and studied over the Internet with teachers and students from all the nodes.

Conferences, workshops & modelling weeks

Workshop on industrial mathematics will be organised on the Finnish Mathematical Days, January 2026.

The network will disseminate information on ECMI modelling weeks, Student competitions, and ECMI conferences to its members.

Africa-cooperation

We will continue collaboration with the African-European network CoRE-Math (Cluster of Research Excellence in Mathematics, www.africaeuropecoremath.org) that aims to develop a collaborative PhD program in mathematics that delivers “high-quality, sustainable training to meet the demand for well trained mathematicians in academia and society. Finland is represented in the management group of CoRE-Math, action planning etc. LUT is a partner of the network with several European universities. We chair the working group on Academia-Industry-Society outreach activities within the CoRE-Math.

Tampere University has a three-year Erasmus+ agreement with universities in southern Africa. Within its framework, Finnish researchers will hold courses in industrial mathematics at the respective universities, and African students can visit Tampere University.

In 2025, this will be realized in Arusha, Tanzania, as a lecture course related to the possibilities of data mining. In addition, two students from the University of Namibia will visit Tampere University for the fall semester.

OpenDesk

The Finnish network will promote OpenDesk, “A Window to connect companies with industrial mathematics” and find experts in Finland to participate in the industrial OpenDesk problem solving process.

The network seeks international Finnish companies interested in applying mathematics in their R&D. In joint meetings the company’s problems will be posed and screened by professionals. Depending on the problem, an expert group will be set up to work with it. There are also other options available, such as study groups, modelling weeks and OpenDesk-process.

Projects

Can be found on the members' homepages:

- LUT University: <https://www.lut.fi/web/en/school-of-engineering-science/research>
- Tampere University: <https://www.tuni.fi/en/about-us/computing-sciences#switcher-trigger--research>
- University of Eastern Finland (Kuopio): <https://uefconnect.uef.fi/en/group/computational-physics-and-inverse-problems-research-group/>
- University of Eastern Finland (Joensuu): <https://www.uef.fi/en/research#paragraph-1321>
- University of Jyväskylä: <https://www.jyu.fi/en/research>

- University of Oulu: <https://www.oulu.fi/en/university/faculties-and-units/faculty-science/mathematical-sciences>
- University of Helsinki: <https://www.helsinki.fi/en/faculty-science/research>

Organization

The council of the network will have about 8 meetings with the following members:

Sampsa Pursiainen TAU (chair),
 Matti Heiliö LUT (vice-chair)
 Seppo Pohjolainen TAU (secretary)
 Esko Turunen TAU, Simo Ali-Löytty (deputy)
 Lassi Roininen LUT, Matti Heiliö (deputy)
 Timo Tiihonen JYU, Ilkka Pölönen (deputy)
 Marko Vauhkonen UEF/Physics
 Risto Korhonen UEF/Mathematics
 Mikko Sillanpää OU, Marko Leinonen (deputy)
 Samuli Siltanen HU, Sangita Kulathinal (deputy)

The network has members in the following organizations:

EU-MATHS-IN

Council: Sampsa Pursiainen, Matti Heiliö (deputy)

National point of contact for Dissemination and Media activities: Seppo Pohjolainen

National point of contact for Success Stories: Marko Vauhkonen

National point of contact for Job Portal: Simo Ali-Löytty

ECMI

Council: Sampsa Pursiainen, Lassi Roininen (deputy)

COST

Digital Forensics: Esko Turunen