COST Action 23132 Magnetic Particle Imaging for Next-Generation Theragnostic and Medical Research

Annual Newsletter Grant Period 1

Action Chair - Dr. Spiridon Spirou

Sismanoglio General Hospital of Attica, Greece

spiridonspirou@yahoo.com

Vice Chair – Dr. Lejla Alic

University of Twente, Netherlands

lejlaresearch@gmail.com

Scientific Communications Coordinators

Gabriel Pinto

University of Aveiro, Portugal

Supraja Ganti

University of Florida, USA

Contact: SCC@nexMPI.eu

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the European Union

Milestones and Events

1st MC Meeting March 2025, at the University of Würzburg. The meeting brought together researchers and professionals from across Europe to officially launch the network and begin planning key collaborative activities. As the first European MPI- focused network, nexMPI aims to enhance access to MPI technology, foster interdisciplinary cooperation, and position Europe as a global leader in this transformative field—particularly in advancing nanomedicine and next-generation diagnostics.

1st Training School organized by nexMPI, Prague, Czech Republic, June 2025. The Training School covered the physics, technology and applications of Magnetic Particle Imaging (MPI), including basic principles, hardware and software, signal acquisition, signal processing, nanoparticle chemistry and preparation, theragnostic, and potential clinical applications. In the practical, hands-on sessions, the trainees were shown the intricacies of MPI equipment. To the right is a list of instructors at the training school.

1st workshop of the nexMPI COST Action, UCM-Madrid, September 2025 brought together PhD students and early-career researchers to explore the design and application of responsive and advanced materials for nanomedicine. The event highlighted innovative nanostructured systems and stimuli-responsive materials for next-generation drug delivery and nanomedical applications, while fostering interdisciplinary exchange and scientific networking.

The Core Group Members Meeting of the nexMPI COST Action was held at the Academy of Athens, November 2025 bringing together representatives to review the achievements of the first year period and to define priorities and activities for the next year of our Action. The meeting provided a strategic forum for discussion, coordination, and planning, ensuring alignment of ongoing efforts and future initiatives within the nexMPI network.

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY
Funded by the European Union
nexMPI

Grants: STSMs, Dissemination, ITC, YRI Conference Grants

In the first year of NexMPI, **13 STSMs** were awarded, for different destinations, such as Portugal, Germany, UK, USA, Italy, Austria, Spain and Australia.

Grants were also awarded for dissemination, Young Researcher Innovator Conference, and Inclusiveness Target Countries.

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY
Funded by the European Union
nexMPI

Publications & Conference Presentations

Magnetic Staging in Sentinel Lymph Node Procedures: Insights from the LowMag Trial. International Workshop on Magnetic Particle Imaging.

Phase-sensitive signal processing in DiffMag handheld probe

Magnetic staging following sentinel lymph node procedure: The LowMag clinical trial.

Phase-sensitive signal processing in the DiffMag handheld probe

Phase-sensitive signal processing for improved usability of the DiffMag Handheld probe

Exploiting the limitation of the current state of the art segmentation method in MPI imaging

Development of a Laparoscopic Probe for Interoperative Sentinel Lymph Node Localisation

Impact of Lymph Node Matrix on the signals received from magnetic nanoparticles.

Accurate Temperature Mapping with Phase Magnetic Particle Imaging

Enabling Real-Time, Non-Ionizing 3D Imaging of Implantable Magnetic Cements Using Magnetic Particle Imaging

Nickel Ferrite Nanoparticles for In Vivo Multimodal Magnetic Resonance and Magnetic Particle Imaging.

Magnetic particle spectroscopy and magnetic particle imaging of zinc and cobalt ferrite nanoparticles – distinct relaxation mechanisms

Py-MPI: a Python simulation toolbox for Magnetic Particle Imaging

Gram-Scale Production of Iron Oxide Rubik-Cube Nanoparticles: New Tools for the Clinical Translation of Magnetic Hyperthermia and Magnetic Particle Imaging

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY
Funded by the European Union
nexMPI

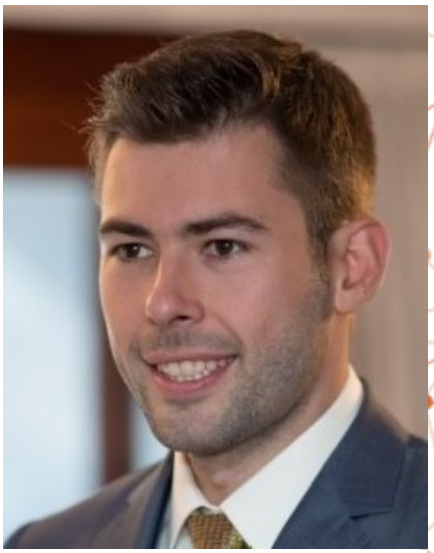
Webinar Series

The nexMPI Webinar Series was launched in September 2025 and meets on a monthly basis, bringing together experts from different fields to discuss a broad range of topics related to MPI technology. The series covers fundamental and applied aspects of MPI, including materials, instrumentation, imaging, and biomedical applications. The webinar series will continue throughout 2026, featuring additional invited speakers and new thematic proposals, with the aim of strengthening scientific exchange and fostering new collaborations among nexMPI members and the wider research community. All the webinars can be viewed through the Action website.

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY
Funded by the European Union
nexMPI

Funding Awards

Dr. Jonathan Leliaert was awarded a prestigious European Research Council (ERC) Grant for THERMAGINE, which closely relates to Magnetic Particle Imaging (MPI). The THERMAGINE project aims to apply advanced understanding of magnetic thermal dynamics to engineer lithographically defined nanoparticles with faster thermal switching. This work addresses a key challenge in biomedical applications: the development of particles that combine large magnetic moments with fast, monodisperse switching, which is essential for efficient magnetic hyperthermia cancer therapy and complementary MPI applications.



Dr. Jonathan Leliaert

Dr. Liam O'Brien

Dr. Liam O'Brien from the University of Liverpool's Department of Physics been awarded a £2.1 million Engineering and Physical Sciences Research Council (EPSRC) Open Fellowship to develop next-generation magnetic nanoparticle tracers for medical imaging and formulation testing. Drawing on expertise from the Departments of Physics and Chemistry, the project will create novel magnetic nanoparticle tracers using advanced magnetic composite materials. These materials will be derived from thin-film magnetic devices similar to those used in mobile phone sensors and hard disk drives.

The German Research Foundation has granted an interdisciplinary team led by physics professor, Dr. Volker Behr, €3.1 million as s part of its large-scale equipment initiative. The SMPI will cover the entire development chain of magnetic particle imaging: from the characterization of new magnetic markers to methodological developments and imaging of larger objects - and, in the future, humans.

Dr. Volker Behr

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY
Funded by the European Union
nexMPI

Upcoming Events and Grant Applications

University of Aveiro Workshop

June 15–17, 2026 | Aveiro, Portugal

STSM Applications

Open Call

Learn more on our website:
nexmpi.eu

Find us on LinkedIn:
https://www.linkedin.com/company/nexmpi

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY
Funded by the European Union
nexMPI