



What is MPNS?

Materials, Physics and Nanosciences

MPNS is home to materials science and physics, extending from conception through production, characterisation, examination, evaluation, fabrication, joining to actual application and service, including related databases, simulation tools, standards and inspections.

In Detail

- **New developments in industrial technology and technology-driven projects requiring the synthesis of new material.** In this context, materials science, physics and nanoscience or combinations thereof will be supported by this Domain. Physics involves many industries and technological processes; it contributes to the synthesis of new materials and to a broad variety of new devices based on the progress made in areas such as optics, plasma physics, surface physics, materials simulation and others.
- **Emerging technologies:** for energy supply, telecommunication biotechnology and related sectors which trigger innovative progress in conventional sectors such as power technology, transport, aerospace, lighting, and monitoring or the establishment of completely new technology areas.
- **Cultural heritage:** the sciences contributing to this Domain are part of cultural heritage as they answer the most fundamental scientific questions related to the ageing of various kinds of objects of art. Therefore the Domain is also responsible for Actions in cultural heritage focusing on restoring and conserving ancient architecture, built environment and artefacts.
- **Multidisciplinary research:** materials science, physics and, to an even larger extent, nanoscience are multidisciplinary research fields. The Domain maintains active interaction with other COST Domains on many relevant issues such as environment, global warming and social aspects of nanotechnology.

By recognising the huge potential of nanosciences in such different areas the Domain encourages multidisciplinary actions and cooperates closely with the other Domains. Therefore, new ideas and initiatives are welcome as well as all ideas with high interdisciplinary elements, close links and overlaps with other Domains.

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Current COST Actions within the MPNS Domain:

- **MP0701** Composites with Novel Functional and Structural Properties by Nanoscale Materials (Nano Composite Materials-NCM)
- **MP0702** Towards Functional Sub-Wavelength Photonic Structures
- **MP0801** Physics of Competition and Conflicts
- **MP0802** Self-Assembled Guanosine Structures for Molecular Electronic Devices
- **MP0803** Plasmonic Components and Devices
- **MP0804** Highly Ionised Pulse Plasma Processes
- **MP0805** Novel Gain Materials and Devices Based on III-V-N Compounds
- **MP0806** Particles in turbulence
- **MP0901** Designing Novel Materials for Nanodevices: from Theory to Practice (NanoTP)
- **MP0902** Composites of Inorganic Nanotubes and Polymers (COINAPO)
- **MP0903** NANOALLOY – Nanoalloys as Advanced Materials: From Structure to Properties and Applications
- **MP0904** SIMUFER: Single- and Multiphase Ferroics and Multiferroics with Restricted Geometries
- **MP0905** Black Holes (BH) in a Violent Universe
- **MP1001** IOTA – IOn Traps for tomorrow's Applications
- **MP1002** Nano-IBCT– Nanoscale Insights into Ion Beam Cancer Therapy
- **MP1003** ESNAM – European Scientific Network For Artificial Muscles
- **MP1004** Hybrid-ES – Hybrid Energy Storage Devices and Systems for Mobile and Stationary Applications
- **MP1005** NAMABIO - From nano to macro biomaterials (design, processing, characterization, modelling) and applications to stem cells regenerative orthopaedic and dental medicine
- **MP1006** FPQP – Fundamental Problems in Quantum Physics
- **TD0906** Biological Adhesives: From Biology to Biomimetics
- **TD1007** Bimodal PET-MRI molecular imaging technologies and applications for in vivo monitoring of disease and biological processes
- **MP1101** Biomedical Applications of Atmospheric Pressure Plasma Technology
- **MP1102** Chemical imaging by Coherent Raman microscopy – microCoR
- **MP1103** Nanostructured materials for solid-state hydrogen storage
- **MP1104** Polarization as a tool to study the Solar System and beyond
- **TD1103** European Network for Hyperpolarization Physics and Methodology in NMR and MRI

Success Stories

COST Action 529 has helped create a new generation of light sources and efficient recycling procedures. These are based on new materials that support higher temperatures and pressures and resist to hard UV radiation and corrosion.

More than a hundred specimens of a 'COST Reference Lamp' based on metal halides have been produced by Philips and distributed to various laboratories for testing and metrological analysis.

COST Action P10 helped physicists in Dublin to draft new predictions for house price dynamics that contradicted the guesses of financial experts. Results pointed clearly to the nature and extent of the house price crash in both the UK and Ireland that triggered the current financial crisis.

How to join a COST Action

Scientists interested in joining an ongoing COST Action should contact the Action Chair and the COST National Coordinator in their member country (www.cost.eu/cnc).

To propose a new Action, visit: www.cost.eu/opencall. COST assesses new proposals two times a year.



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