



ABOUT ColOpt

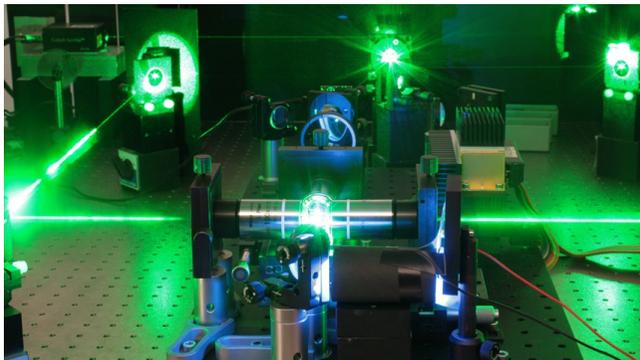
ColOpt is a novel research and training network for young scientists in the fields of cold atoms, quantum physics, optical technologies and complexity science.

The research training provided will comprise a broad portfolio of technical and transferable skills training on local and network level.

Major secondments to partners, in particular inter-sectorial placements, are an intrinsic part of the network experience.

Each of the fifteen individual projects will be part of a vibrant and stimulating international and inter-sectorial collaboration.

Our graduates will be excellently prepared for a broad range of academic and industrial careers and be at the forefront to drive the emerging quantum technologies.



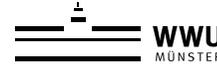
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This project receives funding from the European Union's Horizon 2020 Research and Innovation Programme under the Marie Curie Skłodowska-Curie Grant Agreement No. 721465.



PARTNERS

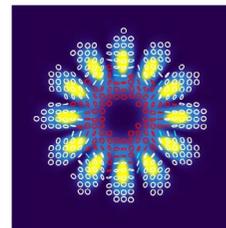
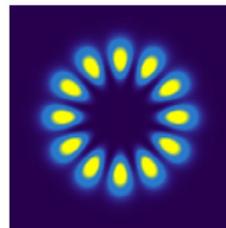


PROJECT CONTACT

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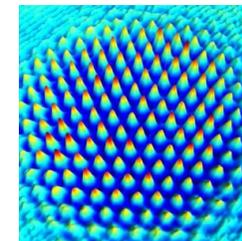
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Collective effects and Optomechanics in Ultra-cold Matter



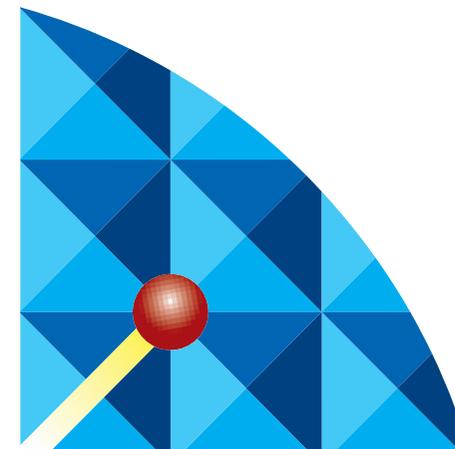
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European Training Network

Funded by the Marie Skłodowska-Curie Action January 2017 – December 2020



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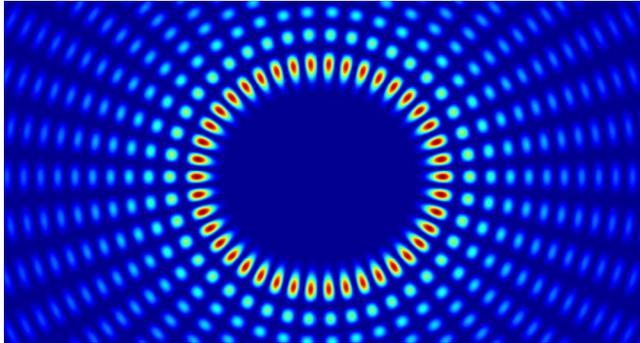


COLOPT RESEARCH

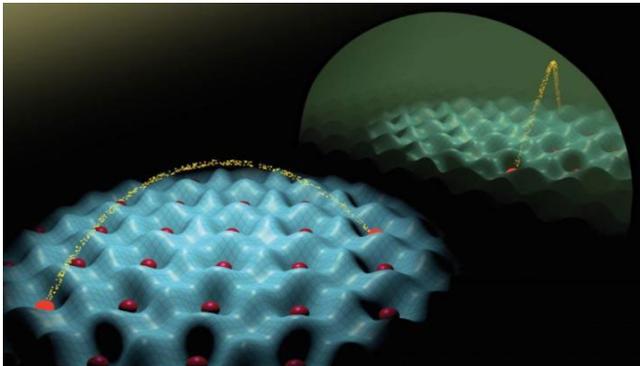
ColOpt's research programme focuses on collective interactions of structured light with laser-cooled cold and quantum-degenerate matter.

Collective, nonlinear dynamics and spontaneous self-organization are abundant in nature, sciences and technology and of central importance.

Building on this interdisciplinary relevance, a particular novelty of ColOpt is the integration of classical and quantum self-organization. We will explore innovative control of matter through opto-mechanical effects, identify novel quantum phases, enhance knowledge of long-range coupled systems and advance the associated trapping, laser and optical technologies, thus establishing new concepts in quantum information and simulation.



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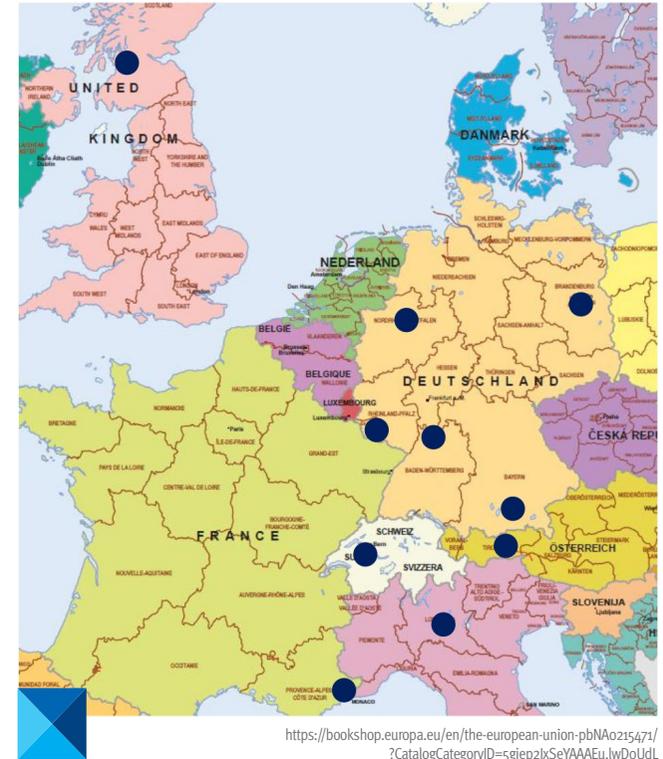
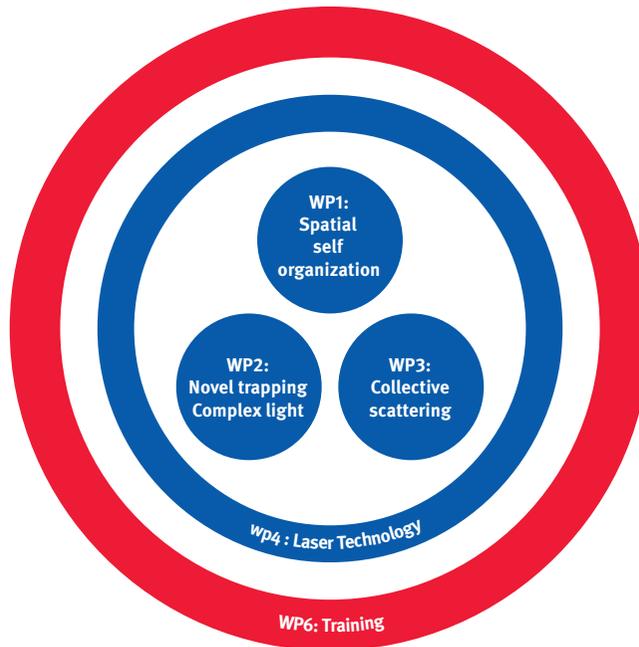
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COLOPT RESEARCH

Four scientific work packages will explore:

- 1. Spatial self-organization**
This WP studies the spontaneous emergence of regular spatial order from optomechanical nonlinearities in cold atomic ensembles as well as quantum degenerate gases.
- 2. Novel trapping schemes and complex light fields**
This WP advances light trapping tools for application in quantum information technology realizing complex, unconventional and disordered potentials and to store information in quantum coherences.
- 3. Collective scattering and coupled dipoles**
This WP addresses phenomena of collective scattering and interaction of dipoles emerging at high optical density due to the interaction of many atomic dipoles.
- 4. Laser technology**
Two leading European laser manufacturers will advance the performance of Ti:Sapphire and semiconductor laser systems.



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OUR NETWORK

The ColOpt network brings together fifteen world leading research organisations and industry in the fields of cold atoms, quantum physics, optical technologies and complexity science:

- University of Strathclyde, Department of Physics
- University of Glasgow, School of Physics and Astronomy
- Università degli Studi di Milano, Dipartimento di Fisica
- Westfälische Wilhelms-Universität Münster, Institut für Angewandte Physik
- Eberhard Karls Universität Tübingen, Physikalisches Institut
- Universität des Saarlandes, Theoretical Physics
- ETH Zürich, Institute for Quantum Optics
- Universität Innsbruck, Institute for Theoretical Physics
- CNRS, Institut de Physique de Nice
- TOPTICA Photonics AG
- Holoeeye Photonics AG
- M Squared Laser Ltd
- Third country partners:
 - o University of São Paulo, Instituto de Física
 - o University of Wisconsin, Department of Physics