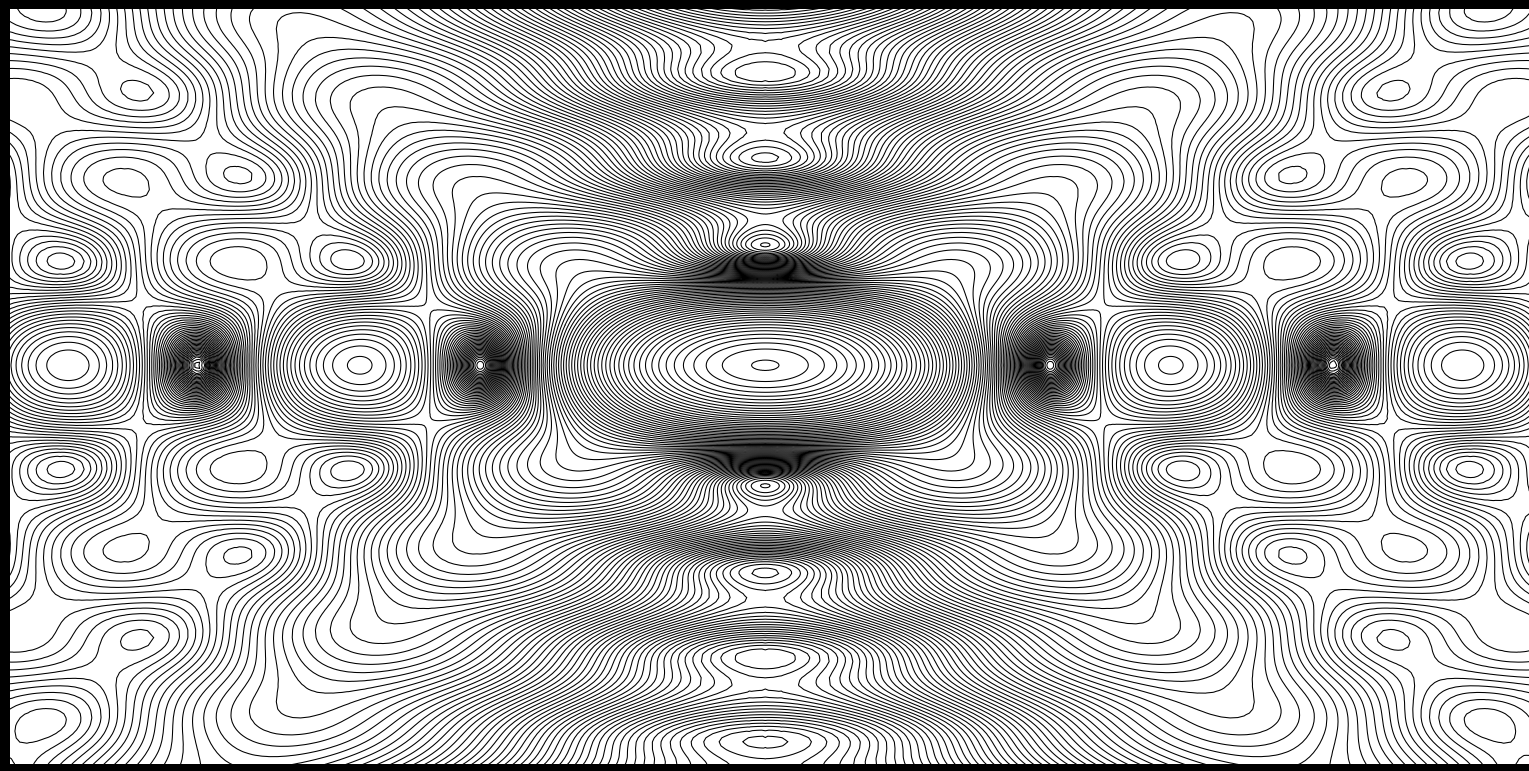
Structures in confined light

– from topology to microscopy –

22-25 March 2020
Physikzentrum
Bad Honnef

https://confinedlight.net



Topics:

- Microscopy
- Nanooptics
- Strong focusing
- Topological optics
- Wave morphology
- Optical spin-orbit linking
- Confined light
- Symmetry breaking
- Optical helicity and chirality
- Angular momentum of light
- Vector vortex beams
- Non-trivial structures in light
- Non-reciprocity
- Light matter interactions
- Spatialotemporal focussing

Deadlines:

- Pre-registration:
  22 December 2019
- Abstracts:
  19 January 2020

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Organizers:

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  MPI for Solid State Research
- Peter Banzer
  MPI for the Science of Light
- Jörg Götte
  University of Glasgow

720. Heraeus Seminar

WILHELM UND ELSE
HERAEUS STIFTUNG

Invited Speakers

Structures in confined light

- Robert W. Boyd
- Etienne Brasselet
- Mark Dennis
- Cornelia Denz
- Jörg Enderlein
- Sonja Franke-Arnold
- Henkjan Gersen
- Bert Hecht
- Simon Horsley
- Kobus Kuipers
- Philipp Kukura
- Gerd Leuchs
- Olivier Martin
- Gabriel Molina-Terriza
- Manuel Nieto Vesperinas
- Agnieszka Popiołek-Masajada
- Halina Rubinsztein-Dunlop

Abstract:
The ability to shape light has revolutionised imaging, optical trapping and both quantum and classical communication. The simultaneous control over both spatiotemporal intensity and polarization structures requires new approaches to optical devices such as metamaterials and -surfaces while at the same time the handedness of structured light lends itself to imaging, probing and manipulating the geometry and potentially chirality of matter. In addition, the generation, propagation and interaction of structured light with matter is governed by topological invariants and conservation laws, which add a complex mathematical component to this exciting and interdisciplinary field.
This is why we would like to bring together both young scientists and established, world leading experts from different areas such as mathematical optics, chemistry, microscopy, material science and biomedical physics

Motivation:
Light is among the oldest phenomena about which laws and hypotheses were published. The understanding of these most basic optical effects led to the ability to shape and focus light. This greatly contributed to the development of first optical instruments, ranging from microscopes to telescopes, enabling the evolution of a multitude of scientific disciplines. This level of controlling light still places optics at the forefront of research whenever it is necessary to manipulate matter, probe materials or transmit information.
In the past decades, this field has experienced an enormous boost as more sophisticated techniques and methods were invented, driving new discoveries in material science,microbiology and medicine. In advanced spectroscopy all the way to superresolution imaging, such techniques rely on scattering and diffraction phenomena of strongly confinedlight beyond the paraxial approximation. At the same time, intriguing novel properties of electromagnetic fields have been discovered.In this context it is important to note that the manipulation of light is not restricted to poweror wavelength only. Light also carries polarization and phase degrees of freedom, which canalso be tailored both spatially and in time. These electromagnetic properties are intimatelyconnected to vectorial and scalar optical singularities - undefined points in a light field -often associated with the angular momentum of light.