

# **Topology in condensed matter: from quantum Hall physics to optical flux lattices**

Prof. Dr. Roderich Moessner

*Max-Planck-Institut für Physik komplexer Systeme, Dresden*

For several decades already, we have had at our disposal a classification of the states of matter thanks to the ordering principles of symmetry breaking and universality. The discovery of the quantum Hall effects in the 1980s has opened a window on an entirely new field of condensed matter physics that still holds many mysteries to this day. This talk presents some of the central ideas underpinning this new 'topological physics', and exposes how similar ideas and their concomitant mathematical structures appear in varying guises, providing connections between seemingly disparate phenomena. These even lead to new strategies for designing systems in which to observe yet further aspects of topological condensed matter physics.