

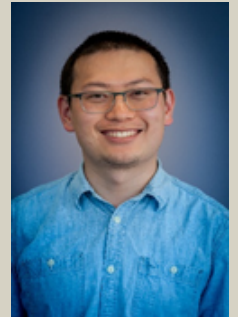


MQ Photonics Research Centre Seminar

When: Tuesday 13 August 2019

Time: 11 am

Where: Multipurpose room, 2.300 7WW



Dr Haoran Ren

Title: Orbital Angular Momentum for Holography and On-chip Applications

Orbital angular momentum (OAM), manifested by a twisted helical wavefront of light, is a new way to boost the information capacity of light due to an unbounded set of OAM modes. However, OAM of light has not been implemented as an independent information carrier for optical holography, mainly due to the lack of mode selectivity in conventional holograms. Without careful design, a digital hologram destroys the extrinsic OAM property in the holographic reconstruction process. We have developed orbital angular momentum holography by using strong OAM selectivity in the spatial-frequency domain with no theoretical upper limit to the number of modes. This demonstration allows the encoding and multiplexing of 10 OAM-dependent holographic images from a single hologram, opening the possibility of high-capacity holographic information storage and displays using the OAM degree of freedom. Implementing OAM holography with high-resolution metasurfaces allows subwavelength-scale-digitization of an OAM-multiplexing meta-hologram, paving the way for ultrahigh-capacity holographic applications.

Bio: Dr. Haoran Ren is a Humboldt Research Fellowship postdoc at the Chair in Hybrid Nanosystems in the Faculty of Physics at Ludwig Maximilian University of Munich. Ph.D. (2013-2017) in Optical Engineering from Swinburne University of Technology in Australia. From October 2016 he was a postdoc at RMIT University. Holder of a Humboldt Research Fellowship (2019-2020) and a Victoria Fellowship (2017). Visiting Fellow (2018) at Centre national de la recherche scientifique (CNRS). His research interests include nanophotonics, nanoplasmonics, and information optics.