# Exploring Waveguiding Phenomena in an Optical Microcavity

C Toebes[1], J Klaers[1], V Sharoglazova[1], M Puplauskis[1], and C.U. Mattschas[1]

[1]*Faculty of Science and Technology, University of Twente, Enschede, The Netherlands*
Contact Email: c.toebes@utwente.nl

Controlling the flow of light in optical microcavities is crucial for exploring various physical phenomena, such as Bose-Einstein Condensation, spin-glass simulation, and non-Hermitian physics. Here, we demonstrate our efforts in manipulating and measuring the transverse movement of light inside such microcavities using waveguide structures. The methods used for controlling the flow of light in our system will be explained first, after which we will go in detail into two experiments that showcase the versatility of these methods. The first experiment concerns altering the flow of light, and thereby the overall state of the system, within a Mach-Zehnder interferometer. The second experiment showcases a novel way of quantifying light propagation in classically forbidden regions.