

# Master thesis projects in Cavity-optomechanical devices for quantum technologies

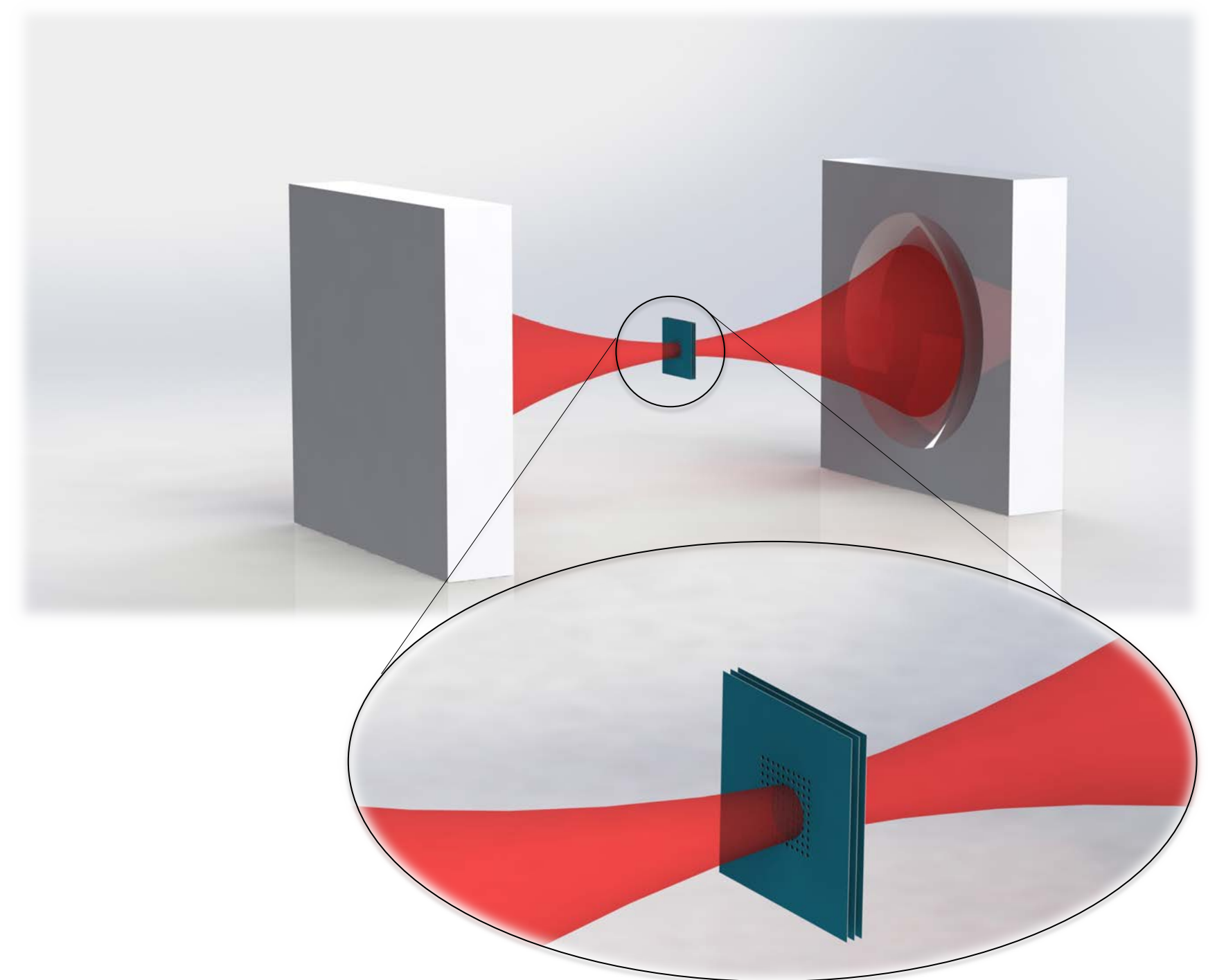
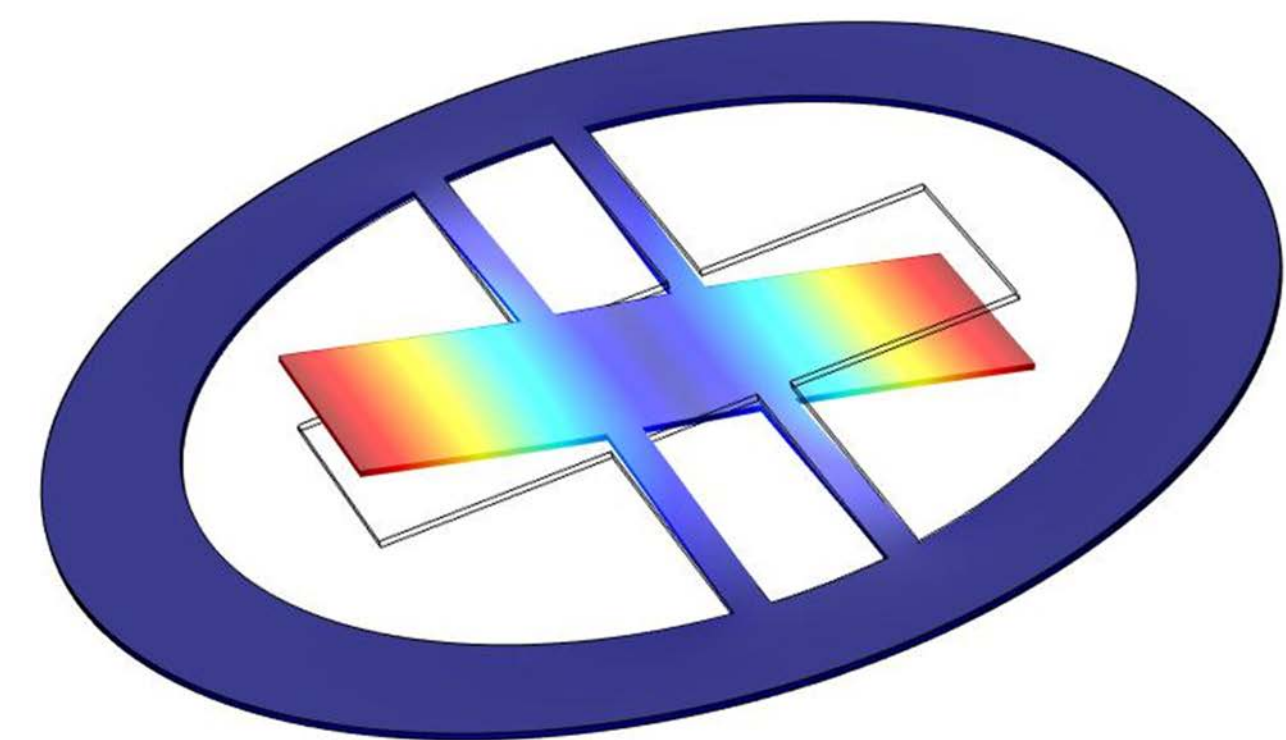
In a cavity optomechanical system, light interacts with mechanical motion via radiation pressure. This force is used to control the mechanical system, even down to the quantum regime. In our lab, we design and fabricate novel optomechanical devices and explore their application for quantum technologies.

- **Simulation of different optomechanical device geometries**

Optomechanical devices can be fabricated from different materials and geometries that are tailored to specific applications.

**This project looks into** simulating various mechanical device geometries using FEM simulations with the goal to optimize the structures w.r.t. resonance frequency, loss and optomechanical coupling

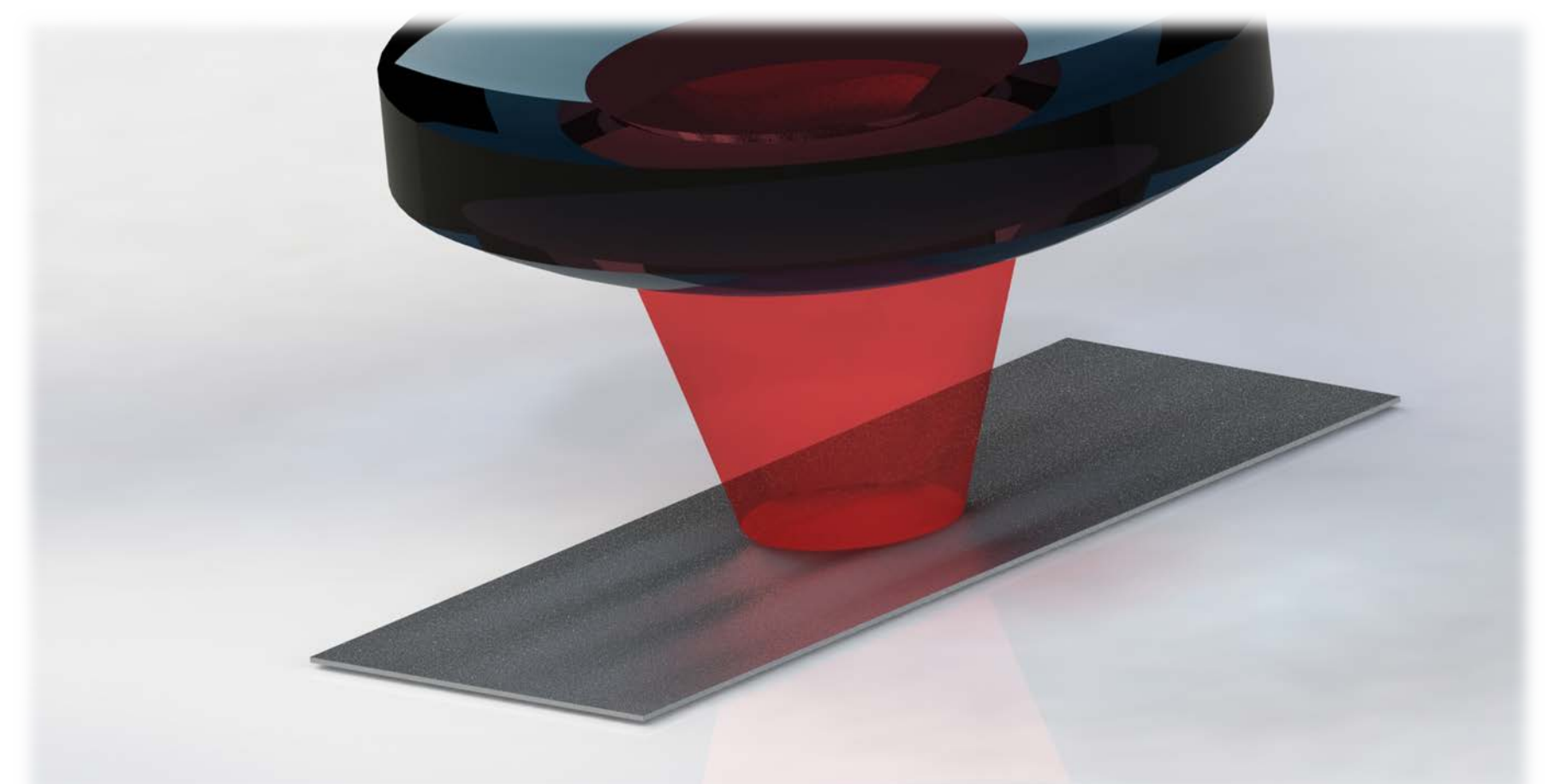
**Another project looks into** simulating the coupling between a closely-spaced mechanical resonator array such that optical near field effects have to be considered, which could enhance the optomechanical coupling.



- **Mapping the topology of mechanical modes: 2d-characterization of mechanical motion**

Once a mechanical device has been fabricated, its mechanical properties, in particular resonance frequency, quality factor and mode structure, will be experimentally characterized.

**This project looks into** designing an experimental set-up for optically detecting the spatially-resolved motional amplitude of a mechanical device.



Check the Mechanical Quantum Devices site  
[www.wieczorek-lab.com](http://www.wieczorek-lab.com)  
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