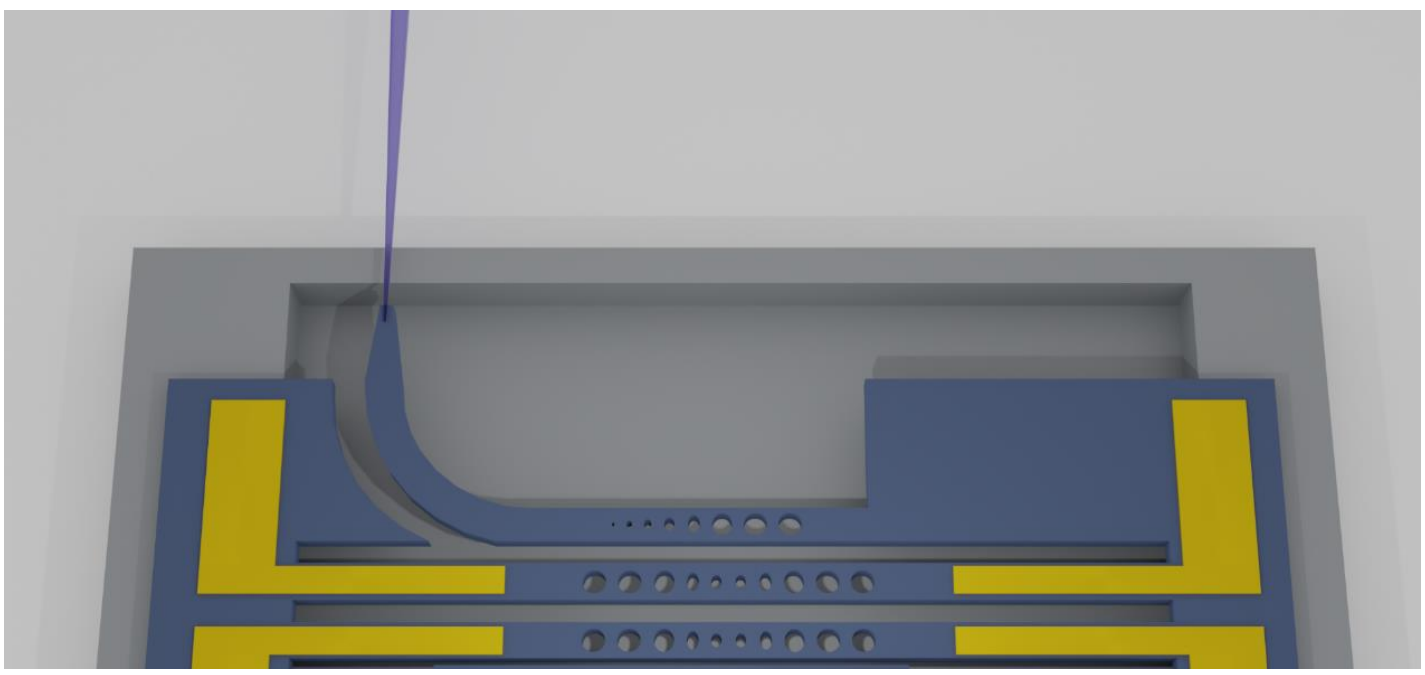
Master's thesis project:
Integrated on-chip spectrometer

On-chip 1D photonic crystals (PhC) allow to confine and manipulate light within a very small mode volume. Using the electrostatic force, one can create wavelength selective transmission/reflection with high resolution by tuning the resonance of the PhC. The aim of this project is to develop on-chip spectroscopy devices with using integrated tuneable opto-electromechanical structures.

In order to spectrally decompose an input light field using an integrated PhC device, this project will allow you to:

1) Simulation: evaluate the PhC's response to electrostatic force tuning, and its spectral response with simulation tools (e.g., COMSOL)
2) Design: create the layout for the devices to be fabricated in the Kavli cleanroom nanofabrication facility.
3) Characterization: measure and analyze the electrostatic and the spectral response of the devices, both at room temperature and in a cryogenic environment.



When?

From March 2023 on or as soon as possible

Interested?

We are looking forward to hearing from you and will be happy to answer any questions that you may have on this project. Please contact x.yao-2@tudelft.nl for more details.

References

1. Cheng, Risheng, et al. "Broadband on-chip single-photon spectrometer." *Nature communications* 10.1 (2019): 4104.

2. Hartmann, Wladick, et al. "Broadband spectrometer with single-photon sensitivity exploiting tailored disorder." Nano letters 20.4 (2020): 2625-2631.

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