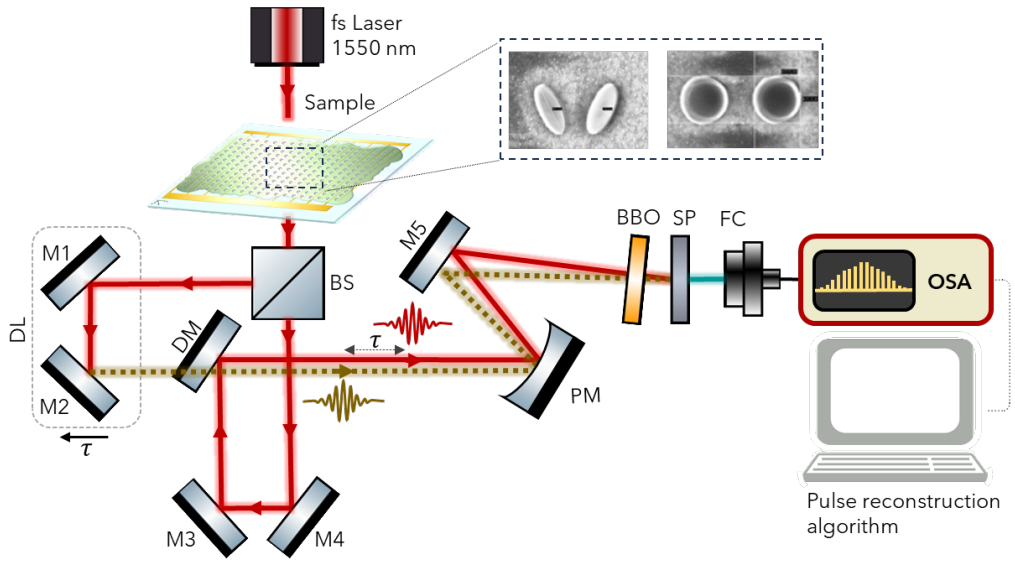
Job title	Semester and Master thesis opportunities in **Shape Light with Nanostructures – Semester Project in Ultrafast Photonics**

Your mission

Exciting Semester Project Opportunity in Ultrafast Photonics!

The Hybrid Photonics Laboratory at EPFL is looking for talented and motivated students to join us for a semester project (which can lead to a Master thesis) focused on the **design**, **simulation**, and **experimental characterization** of photonic nanostructures capable of controlling the phase and amplitude of femtosecond laser pulses.
After obtaining promising simulation results, the nanostructures will be fabricated at CMI, followed by experimental pulse characterization using Frequency-Resolved Optical Gating (FROG) in our optics lab.
During the simulation phase, you will learn how to analyze results, identify key parameters, and optimize them for efficient pulse shaping. In the experimental phase, you'll measure the intensity of a femtosecond pulse using your setup and apply a pulse reconstruction algorithm to retrieve the temporal shape of the pulse. You will then study how different novel photonic platforms (provided for you) impact the shaped pulse.
With this project, you'll play an active role in paving the way towards advanced pulse shaping using active photonics.



Schematic of the FROG setup

What you will learn about

- Simulation of various nanophotonic geometries to achieve efficient phase and amplitude modulation in the wavelength range of interest
- Pulse shape reconstruction in the time domain using a FROG algorithm
- Tailoring femtosecond pulse shapes using cutting-edge nanophotonic platforms

Contacts

Interested candidates, please send your CV and transcript of records to Zahra Basiri at zahra.basiri@epfl.ch and Prof. Cristina Benea-Chelmus at cristina.benea@epfl.ch.

References

[1]: Ossiander, M., Huang, YW., Chen, W.T. et al. Slow light nanocoatings for ultrashort pulse compression. Nat Commun 12, 6518 (2021).