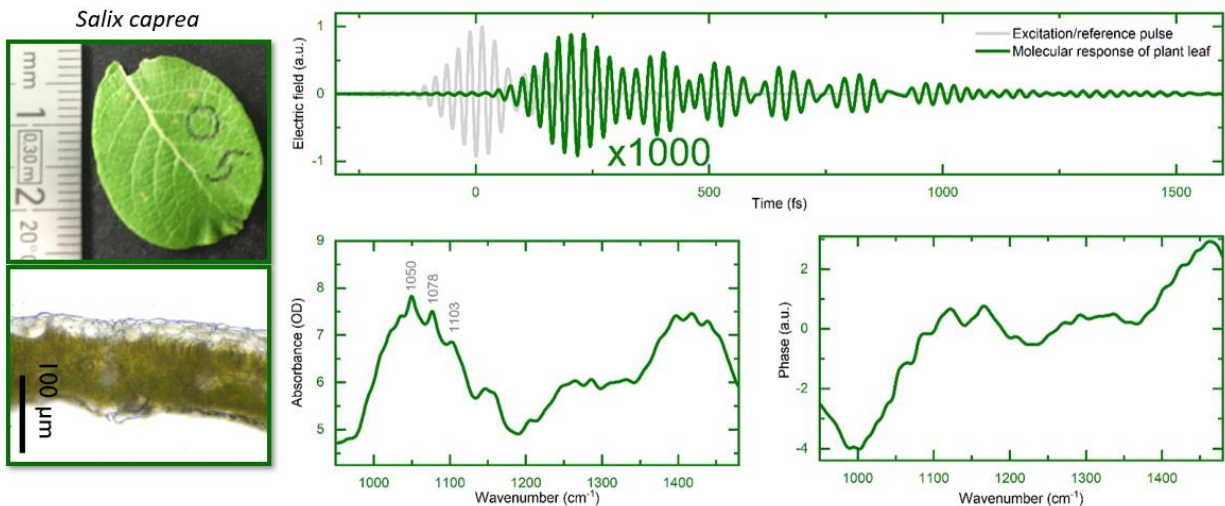


Master's project on field-resolved infrared spectroscopy of living plants

(for master students of Physics, Biophysics or related subjects)



The group of **Broadband Infrared Diagnostics** (BIRD group), at the Chair of Experimental Physics at Ludwig-Maximilians-Universität München, is a unique collaborative venture involving laser specialists, molecular life scientists, mathematicians and clinicians, devoted to the use of state-of-the-art laser-based field-resolved infrared spectroscopy (FRS) for applications in biology and medicine (www.attoworld.de/bird; www.lasers4life.de). Our group is based at the Research Center in Garching (Forschungszentrum Garching, Section Physics of LMU, Am Coulombwall 1, 85748 Garching), which is easily accessible by public transport.

In the proposed master project, we want to test the ability of our technique to monitor carbohydrate metabolism in plant leaves in real time. In general, mid-infrared spectroscopy is sensitive to the molecular composition of a specimen. Recently, we were able to show for the first time that the increased sensitivity of FRS by orders of magnitude enables us to detect the infrared spectra of living plant leaves.¹ In a follow-up work we plan to evaluate whether temporal changes in the spectrum of a plant leaf, day-night cycles, can be detected and whether these changes can be related to the build-up of carbohydrates during photosynthesis.

Please address your interest to join our team to our group leader Dr. Mihaela Zigman (mihaela.zigman@mpq.mpg.de), Dr. Frank Fleischmann (frank.fleischmann@physik.uni-muenchen.de; phone: 089 289 54056) or Marinus Huber (huber.marinus@physik.uni-muenchen.de).

¹Pupeza, I.; Huber, et al. Field-Resolved Infrared Spectroscopy of Biological Systems. *Nature* 2020, 577 (7788), 52–59. <https://doi.org/10.1038/s41586-019-1850-7>.