

SUMMER SEMESTER 2024

RTG 2756 CYTAC SEMINAR SERIES

TUESDAY, JULY 2
17:00 IN HS5

CYTAC

RTG 2756

PROF. DR. JAN HUISKEN

University of Göttingen

CUSTOMIZED LIGHT SHEET MICROSCOPY FOR FAST AND GENTLE 3D BIOIMAGING INSIDE AND OUTSIDE THE OPTICS LAB

The overall goal of the Huisken Lab is to systematically study developmental processes in living organisms using custom, non-invasive biomedical imaging techniques. Over the years, we have developed and perfected imaging tools that offer unique possibilities for analyzing vertebrate development. Our primary tool is advanced, customized light sheet microscopy (LSFM, SPIM). Instantaneous optical sectioning is achieved by illuminating the sample with a sheet of light and generating fluorescence in a thin slice, which is then imaged with a fast camera. Phototoxicity is negligible even at high acquisition rates, making SPIM the ideal platform for long time-lapse experiments. The ability to custom design a microscope around a sample has empowered us to do experiments that have been impossible with commercial instruments. We have now developed Flamingo, a shareable, modular microscopy platform driven by the direct involvement of the biological community. Each microscope is customized for a given application, equipped to travel from lab to lab and to provide widespread access to advanced microscopy. The Flamingo's modularity allows a variety of sample mounting techniques, lens combinations, and orientations within the same framework. The system will evolve over time and is a powerful alternative to commercial solutions, open-source microscopes, and conventional imaging facilities.

