



## Institute colloquium

# Institute Colloquium: Shaping up optical imaging and trapping with synthetic holograp

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Host:

Synthetic Holography, in the sense that the optical wavefront is shaped by pre-calculated patterns on high-resolution liquid-crystal-based phase modulator panels called Spatial Light Modulators (SLMs), is a powerful tool for customizing optical imaging and trapping: Holographic optical tweezers controlled by SLMs have become an indispensable tool in many areas of cell biology because of their enormous flexibility. But these devices may also be integrated into optical imaging systems, using them, for instance, as a programmable Fourier-filter. Thus one can emulate classic techniques for contrast enhancement, for instance dark-field microscopy, Zernike phase contrast, or spiral phase contrast, and toggle between these modalities by simply replacing the image displayed on the screen. The approach facilitates corrections for optical aberrations induced by the set-up or by the sample itself. A further major advantage provided by SLMs is the possibility to multiplex images, for example to combine images from different depths of the sample or for different settings of imaging parameters in one recorded image, implementing e.g. quantitative phase microscopy. Finally, SLM-tailored illumination may also be employed for artifact reduction in linear microscopy or for the fine-tuning of phase-matching in nonlinear CARS-microscopy.

**Monday, May 12, 2014 04:30pm - 05:30pm**

Raiffeisen Lecture Hall, Central Building



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