Innsbruck Physics Colloquium

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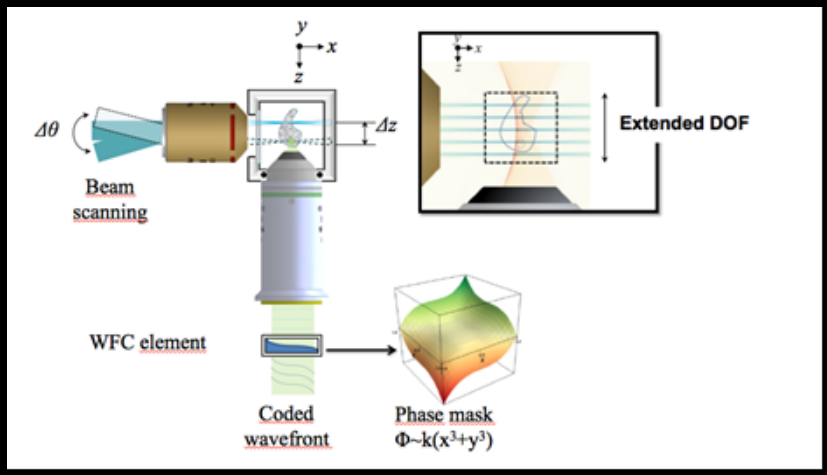
Strategies for fast light sheet microscopy

In light sheet fluorescence microscopy (LSFM), a sheet of excitation light is produced in to the sample. The fluorescence emitted from this plane is collected using a microscope objective, placed orthogonal to the excitation axis. This produce, 2D optical sections from the sample and allows measuring the fast dynamics occurring in such plane. However, accessing the fast dynamics in the full 3D sample is not straight forward. Here, several strategies are presented for obtaining fast volumetric (3D) information from the sample.

First, I will present our efforts for combining LSFM with flow cytometry and microfluidic approaches. Then, I will present the combination of light sheet microscopy with Raman, showing that the system results in 4 orders the magnitude faster than traditional Raman imaging. Finally, I will present the use of wavefront coding (WFC) techniques with LSFM microscopy visualizing the fast dynamics in 3D in biological applications.



Schematic of the light sheet fluorescence microscopy in combination with wavefront coding (taken from O. E. Olarte, et al., Optica 2, 702 (2015)).

Tuesday, 21.11.2017, at 17:15 in lecture hall C

Innsbruck Physics Colloquium, Organisation: M. Beyer, H.-C. Nägerl, A. Reimer