

# Short Course on Chemical Imaging at Europact 2011

## Course Organizer:

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## Hyperspectral Chemical Imaging for Process Analytics

„Chemical Imaging” or “Spectral Imaging” plays more and more an important role in process analysis. The technique allows analysing the lateral distribution of a spectral signature in a material but can also be used for in inline process control with multipoint spectral detection in a plant.

The course will focus on optical spectroscopy (UV/Vis-, Fluorescence-, NIR-, IR- and Raman- Spectroscopy) for Spectral Imaging. The different terms like line scanning, mapping and imaging will be explained and the state of the art technology in Whiskbroom Imaging, Staring Imaging and Pushbroom Imaging will be presented together with multivariate data analysis.

Focus will be given on strategies to separate specular from diffuse reflectance as well as to separate scatter from absorption. A discussion on photon diffusion may answer the question on penetration and information depth in chemical imaging and the problems with a quantification of e.g. an API in a tablet.

The course will be structured as follows:

### Part I: Introduction to Spectral Imaging

- Definition: Whiskbroom-, Staring- and Pushbroom Imaging
- Advantages and disadvantages with practical examples
- Specular and diffuse reflectance, lateral resolution, penetration and information depth in scattering media
- Imaging beyond diffraction limit
- Spin offs: e.g. Multidimensional Fluorescence, Micro Reactor Plant Imaging, Multipoint Spectral Detection, Reactor Tomography, Diffuse Optical Imaging,

### Part II: Leading edge technology and industrial applications

Presenters from industry will demonstrate selected “state of the art” technology in spectral imaging and illustrate various applications in different industries.