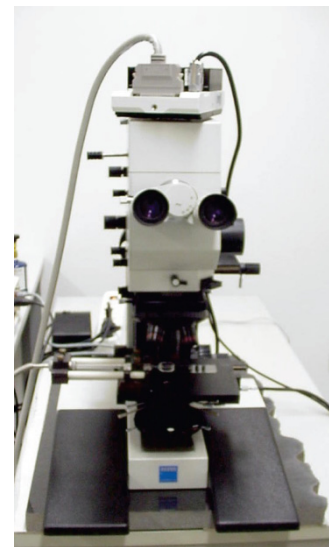


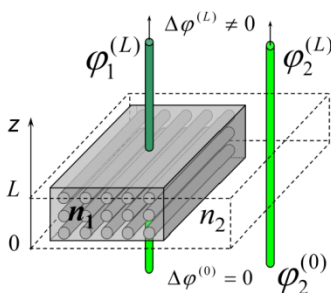
### Interference Microscopy (IFM)

- Interference Microscope Jenamap p dyn (Carl Zeiss GmbH), controlled by a personal computer, a CCD camera (SenSys KAF 0400, Photometrics)
- In-situ monitoring of transient concentration profiles during molecular uptake, release and conversion
- Exploration of the nature of surface barriers by assessing surface permeabilities; determination of the sticking coefficients ( $p_{st}$ ) of nanoporous catalysts
- Applicability depends on sample specifications (particle and pore sizes, sample homogeneity, surface properties)
- For more details, see chapter 12 (introduction to the technique) and 15 to 21 (examples of application) in J. Kärger, D. M. Ruthven, D. N. Theodorou: [Diffusion in nanoporous materials](#), Wiley-VCH, Weinheim 2012



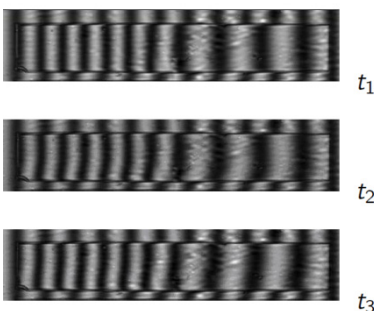
- spatial resolution: up to  $0.5 \mu\text{m} \times 0.5 \mu\text{m}$
- time resolution: 15 s

#### IFM – basic principle

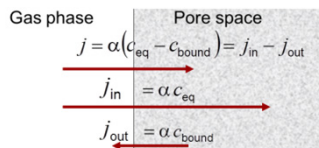
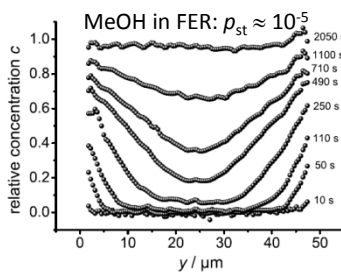
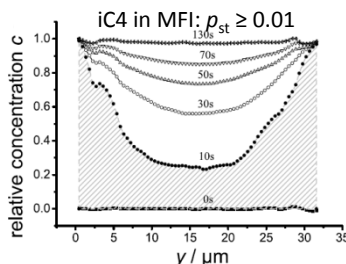


Intensity  $I \propto \cos(\Delta\varphi(L))$

Uptake  $\rightarrow$  shift in IF-patterns

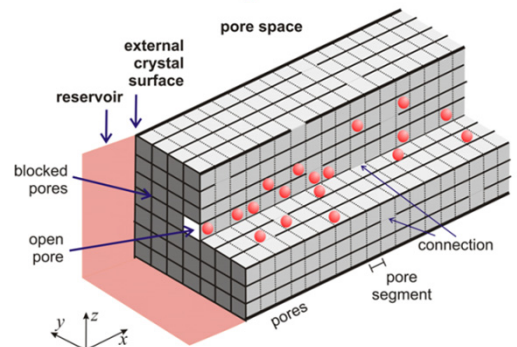
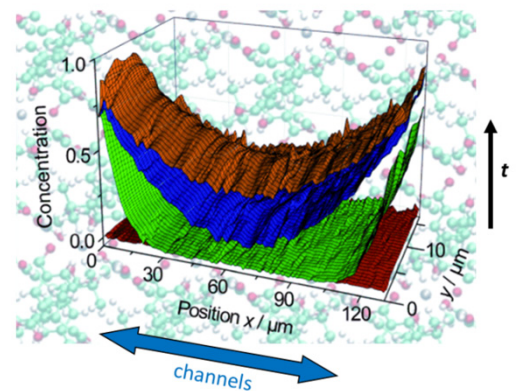


#### Calculation of sticking coefficients



$$p_{st} = \frac{j_{in}}{j_{GS}} = \frac{\alpha c_{eq}}{\frac{N_A}{\sqrt{2\pi}} N_A \frac{1}{\sqrt{RTM}} p}$$

#### Exploring the nature of surface barriers



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