



# PHYSIKALISCHES KOLLOQUIUM

Mittwoch, den 28.04.2010, um 15:30 Uhr

Ort: Reichenhainer Str. 90; Neues Hörsaalgebäude, Raum: 2/N013



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## Metal-polymer nanocomposites for functional applications

Among the functional nanomaterials, nanocomposites consisting of metal nanoparticles dispersed in a dielectric matrix are of particular interest due to their novel functional properties offering hosts of new applications. The present talk is concerned with the preparation of polymer-based nanocomposites by vapor phase co- and tandem deposition and the resulting functional properties. The techniques involve evaporation [1] and sputtering [2], respectively, of metallic and organic components and inter alia allow the preparation of composites which contain alloy clusters of well defined composition. Emphasis will be placed on soft-magnetic high frequency materials with cut-off frequencies well above 1 GHz and high quality factors [3] and on optical composites with tuned plasmon resonances suitable for ultra thin color filters, Bragg reflectors, and other devices [4-6]. In addition, antibacterial coatings [7] and selective sensors for organic vapors based on nanocomposites with filling factors close to the percolation threshold will be addressed. Moreover, a novel approach to produce magnetic nanorods will be presented [8].

### References:

- [1] A. Biswas, F. Faupel et al. Nano Letters, 3, 1, (2003).
- [2] U. Schürmann, F. Faupel et al., Nanotechnology, 16, 1078, (2005).
- [3] H. Greve, F. Faupel et al., Appl. Phys. Lett. 89, 242501 (2006).
- [4] A. Biswas, F. Faupel et al., Appl. Phys. Lett., 84, 2655, (2004).
- [5] H. Takele, F. Faupel et al., Nanotechnology, 17, 3499, (2006).
- [6] H. Takele, F. Faupel et al., Eur. Phys. J. Appl. Phys. (EPJAP), 33, 83, (2006).
- [7] V. Zaporojtchenko, F. Faupel et al., Nanotechnology, 17, 4904, (2006).
- [8] Henry Greve, Franz Faupel et al., Appl. Phys. Lett., 88, 123103 (2006).

Alle Zuhörer sind ab 15:15 Uhr zum Kaffee vor dem Hörsaal eingeladen.