

# Seminar „Festkörperspektroskopie“ WS 12/13

Sondertermin

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## Exchange coupling in polycrystalline AF/FM systems

J. Geshev

Instituto de Física, UFRGS, Porto Alegre, RS, Brazil

Modifications of the magnetic exchange bias, resulting from the exchange coupling between an antiferromagnet (AF) and a ferromagnet (FM), when different type of material is used as a spacer layer (SL) at the AF/FM interface, as a function of the spacer's thickness will be presented. Magnetization and ferromagnetic resonance measurements were employed for the magnetic characterization of the samples for the most part. The films were deposited by magnetron sputtering using as spacers namely Cu (a nonmagnetic metal),  $\text{Al}_2\text{O}_3$  (a nonmagnetic insulator), Cr (a weak AFM), Py or Fe (soft FMs), and subsequently annealed or irradiated with He ions in a presence of a strong magnetic field. Numerical simulations were employed in order to reproduce the experimental data from which the anisotropy and coupling parameters were extracted. Their variations with the SL's type and thickness were compared and discussed. Some remarkable features like negative rotatable anisotropy, strong enhancement of the exchange-bias field when a soft FM is used as a SL, and ultraslow temporal increase of the bias after ion irradiation will be discussed in details.