Technische Universität Berlin **Fachgebiet Mikrotechnik** **Prof. Dr. Heinz Lehr**

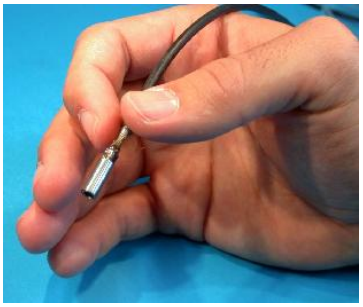
Montag, den 19. Mai 2014 **15:00 - 15:30 Uhr** **Hörsaal EW 115 A**

Electromagnetic Direct Linear Drives for Medical Endoscopes

Seminar lecture presented by Dr.-Ing. Robert Dreyer

Today many medical interventions are performed minimally-invasive, as they cause less traumata than open interventions. The image of the surgical site is taken by an endoscope and displayed on a screen. Present Chip-on-the-Tip Endoscopes do not offer an autofocus or an optical zoom to improve the image quality or to magnify the area of interest. The reason for that is the small installation space inside the endoscope shaft which makes a focal length variation of the optical system difficult. However, electromagnetic direct linear drives are ideally suited to move the lenses.

Different types of electromagnetic direct linear drives, their advantages and a set of design rules that help avoiding mistakes when designing optical systems with linear drives are described.



The actuators can be setup with several stable armature positions or with a continuous travel. The major advantage of stable positions is the low power consumption as the positions are held by reluctance forces. For a focus function often a continuous travel is needed to achieve a sharp image at all object distances.

The talk will be given at the 14th International Conference on Optimization of Electrical and Electronic Equipment (OPTIM 2014) in Brasov, Romania.