



## Topic for Master thesis

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### Micromechanical friction drives, ultrasonic motors and inertial drives

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(course of study: Physics / Electrical Engineering / Electronics / Mechanical Engineering)

**If you have any questions about this topic, please do not hesitate to contact us:**

Mr. Prof. Dr. Harald Schenk  
Phone: +49 351 8823-154  
E-mail: [harald.schenk@ipms.fraunhofer.de](mailto:harald.schenk@ipms.fraunhofer.de)

## Content of Master thesis

The Fraunhofer project group MESYS is presently working on the development of novel, silicon-based actuators. These are electrostatically operated micromechanical drives which require no piezoelectric materials. Linear actuators are currently being implemented with comparable piezoelectric structures in order to allow movements over large travel ranges. This can be realized in the form of friction drives, ultrasonic motors or inertial drives. Such drives can be found for example in positioning tables for microscopes or in zoom lenses for cameras.

The subject of this thesis is to examine whether the novel micro actuators can also be used for such linear drives. In the concept study other linear drives besides the above mentioned types can also be investigated. The aim of the thesis is – besides aptitude test – also the development of specific design proposals.

It is expected that initially common linear drives will be analysed and necessary characteristics and parameters will be studied. In comparison with the characteristics of the novel actuators, the design proposals should work with these characteristics. For this purpose, reduced mechanical finite element simulations can be used. Therefore, knowledge COMSOL or ANSYS is desirable but not a requirement.

## Requirements

Completed main course in Physics, Electrical Engineering, Mechanical Engineering or Microsystems technology; Interest in independent work, micromechanics and micro actuator technology.