Searching for students

MetaLab Research Group
https://slesarenko-lab.com/

Cluster of Excellence *liv***Mat**S
FIT – Freiburg Center for Interactive Materials and Bioinspired Technologies,
IMTEK, University of Freiburg

How do permanent magnets collide? (HiWi, BSc, MSc)

The insertion of magnets (both permanent and electromagnets) as a tool to program and control mechanical metamaterials' energy landscape looks very promising. The involved interplay between elastic and magnetic energy enables the realization of very peculiar behavior unachievable for conventional materials. Even only four permanent Nd-magnets can form four stable configurations, however, these configurations are not equal energy-wise. What are the probabilities for each configuration if magnets move towards each other and collide? In the framework of this project, we will build an experimental setup and then perform multiple collisions recording the movement of magnets via a high-speed camera. The results of this project will help to understand how self-assembling systems can be programmed via additional magnetic interaction between components.

The skills that you can acquire during this project:

1. Building a small experimental setup
2. Image/video processing (Python/Matlab)
3. Statistical analysis of the experiments

Please feel free to contact us if you have any questions.

Dr. Viacheslav Slesarenko, PI

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