



Open HiWi-Positions

We need YOUR support!

Do you want to earn some money besides your studies and gain insights into the everyday life of an experimental physics group? Then come over!

Briefly about the subject:

Our group has been working for several years on realizing Josephson junctions in thin films of the high-temperature superconductor $\text{YBa}_2\text{Cu}_3\text{O}_7$ (YBCO) using He^+ irradiation. This involves scanning with a focused helium ion beam along an arbitrary pattern in a YBCO microbridge (see figure). Along the irradiated area, the YBCO film changes its electrical properties. For example, by "writing" a single line, a Josephson barrier is generated [1]. This flexible and simple way of driving the superconductor to the normal conducting or even insulating state on the nanometer scale opens an extensive range of applications.

This is where you come in.

Over the years, we have significantly optimized the fabrication and characterization processes. But the need for high statistics in fabrication also creates very high measurement overhead. This can no longer be handled by the PhD students alone and we are therefore looking for support in this area.

Your tasks:

- Preparation of irradiated samples (sample mounting, bonding)
- Perform various transport measurements using GoldExi
- Help with optimization of setups (mainly soldering tasks)
- (Graphical representation of generated data - scripts available)

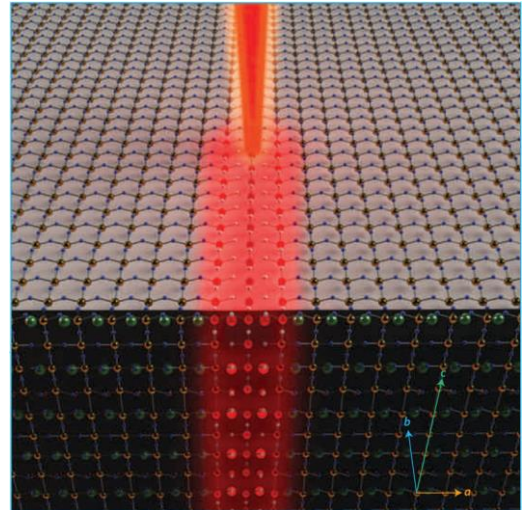


Figure: Artistic representation of He^+ - irradiation in YBCO from [2]

We are looking for students who are interested and willing to learn. The basic requirement is to be at least in the 5th semester and successfully completed the beginner's lab courses. In addition, we expect time management, since the samples must be measured as quickly as possible after fabrication. Per measurement cycle, there is 2h preparation and 6h measurement (~8h/week).

If you are interested or have any questions, you are welcome to drop by my office (D6A44) of Christoph Schmid. Otherwise, just send an email to christoph.schmid@uni-tuebingen.de.

[1] B. Müller *et al.*, Phys. Rev. Applied **11**, 044082 (2019);
<https://doi.org/10.1103/PhysRevApplied.11.044082>

[2] S. A. Cybart *et al.*, Nature Nanotech **10**, 598–602 (2015);
<https://www.nature.com/articles/nnano.2015.76>



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