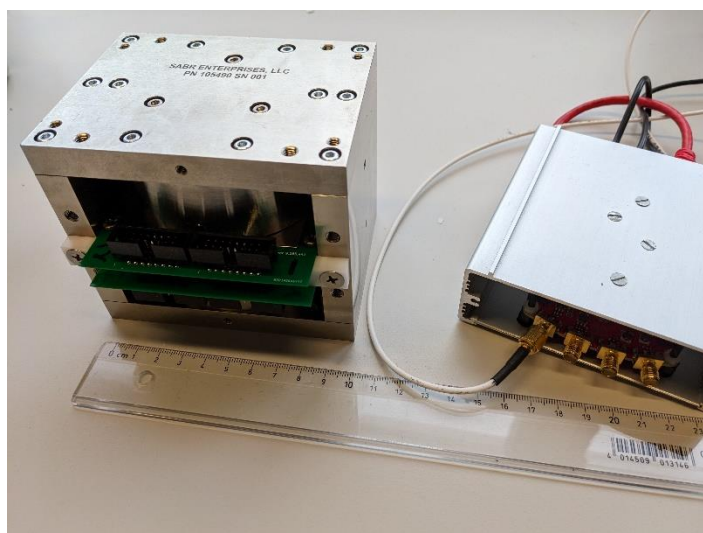


## Master Thesis: Building a 25 MHz NMR spectrometer

*Nuclear Magnetic Resonance (NMR) spectroscopy is the most powerful tool in analytical sciences and a wonderful playground for quantum physics. Due to the high costs, currently, countries of the Global South have no access to NMR spectrometers. Our vision is to build a NMR spectrometer, which will cost less than CHF 10'000.*

A Master project starting in Spring 2023 is available in the group of Prof. Roland Riek, Laboratory for Physical Chemistry (D-CHAB). The student will build a 25 MHz Nuclear Magnetic Resonance (NMR) spectrometer. The spectrometer console will run on a compact board (SDR Lab, Red Pitaya) [1]. A permanent magnet will ( $10 \times 10 \times 10 \text{ cm}^3$ ) generate a field of 0.6 T, corresponding to a  $^1\text{H}$  NMR frequency of 25 MHz.

- Do you want to build your own spectrometer?
- Are you interested in or would like to learn more about: programming (e.g., Python), electronics and hardware (magnetic resonance)?
- Are you a student in physics, electrical engineering, quantum engineering, information technology, interdisciplinary natural sciences, physical chemistry,...?



Curious to know more? Please contact Dr. Takuya Segawa: [segawat@ethz.ch](mailto:segawat@ethz.ch).

[1] V. Negnevitsky et al. (2022), [arXiv:2208.01616](https://arxiv.org/abs/2208.01616)