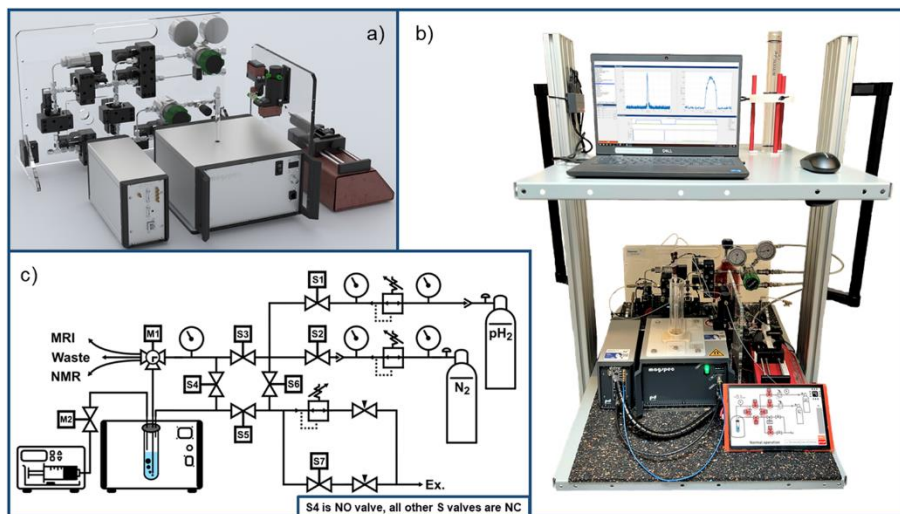


Vacancy: Hardware Design for a High-Pressure Parahydrogen-Induced Polarization

Project description

Several hyperpolarization techniques were developed to enhance the intrinsic low signal of Nuclear Magnetic Resonance (NMR) and Magnetic Resonance Imaging (MRI) to observe real-time and in vivo metabolic processes. Parahydrogen (pH_2) is the nuclear spin isomer of molecular hydrogen that can be generated on a large scale by cooling down normal hydrogen. pH_2 -induced hyperpolarization (PHIP) already demonstrated ^{13}C -polarization of pyruvate above 10%.



Within the scope of this R&D project, a novel parahydrogen-induced polarizer will be constructed. The project continues our preliminary studies (Ellerman et al., Nat. Comm. 2023, DOI: 10.1038/s41467-023-40539-9) and our recent unpublished know-how.

Position:

This Ph.D. position (or 70% Post.Doc.) aims to develop a novel high-pressure PHIP-reactor with applications in biology and medicine.

This is a 3-year 75% TVL-13 (German income class) fixed contract position (about 58,000 Euro/year before tax, about 2,000±100 Euro/month after tax, depending on your professional experience) starting as soon as possible (e.g., January 2026).

Your tasks:

- ☐ Developing the PHIP-hyperpolarizer;
- ☐ Performing hyperpolarization experiments with PHIP-hyperpolarizer;
- ☐ Presenting the results at national and international conferences and publishing results in scientific journals

Your profile:

- ☐ Knowledge in NMR/MRI are not prerequisite;
- ☐ You have completed your university studies (master's degree or German Diploma) in physics, chemical physics, biomedical technology, or a comparable engineering field.
- ☐ You have knowledge, practical experience in automation, hardware construction;
- ☐ Experience in programming, modeling, and analyzing data would be an advantage.
- ☐ You have a very good command of spoken and written English.

We offer:

- ☐ A position at the second-largest University Hospital in Germany with access to state-of-the-art magnetic resonance equipment;
- ☐ Access to imaging, chemical, and RF-electronics facilities of the section of biomedical imaging of Kiel University (PI Prof. Jan-Bernd Hövener);
- ☐ An intensive Ph.D. supervision in an interdisciplinary team
- ☐ An excellent public transportation and bicycle highway directly to your workplace

PI of the project and contact person

Dr. Andrey Pravdivtsev, andrey.pravdivtsev@rad.uni-kiel.de

BMBF hyperpolarization group leader,

Section Biomedical Imaging, Dept. for Radiology and Neuroradiology, UKSH and Kiel University