



Conducting research for a changing society: This is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,400 employees in one of Europe's biggest research centres and help us to shape change!

At the Institute of Energy and Climate Research - Fundamentals of Electrochemistry (IEK-9), we perform research on highly relevant topics related to the energy transition. For example, we investigate the battery of the future and new battery concepts. How we can turn the greenhouse gas carbon dioxide (CO₂) into the fuel of the future or how electrolysis can contribute to a hydrogen energy economy are other exciting projects. The aim is to develop sustainable and cost-effective batteries and fuel cells with improved energy and power density, longer life-time, and maximal safety. Find out more about our mission and future-oriented projects here: <https://go.fzj.de/IEK-9>

We are offering a

Internship / Master Thesis – Methods for NMR Pulse Analysis and Application in Electrochemical Experiments

Your Job:

At IEK-9, we are developing exciting interdisciplinary methods to investigate the key mechanisms in batteries and electrolysis using pulsed NMR. By understanding the spin states that have to be experimentally prepared we are tailoring magnetic pulses to push the limits of NMR in operando experiments, probing for example interfaces or membranes. For an optimized workflow, a detailed characterization of these pulses is highly useful. The project focuses on the implementation and testing of a state-of-the-art spectrogram pulse analysis method. Your tasks include:

- Porting a state-of-the-art spectrogram module for pulse sequence analysis from Matlab to Python
- Testing the spectrogram module on several published pulse sequences
- Exchange with experimental NMR spectroscopists
- Investigating how electrochemical NMR setups may influence spin state preparation using spectrograms

Your Profile:

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our

Online-Recruitment-System!

Questions about the vacancy?

Get in touch with us by using **our contact form**.

Please note that for technical reasons we cannot accept applications via email. www.fz-juelich.de

- Ongoing master studies in chemistry, physics, data science, computer science or a related field
- Knowledge on the fundamentals of NMR spectroscopy required
- Experience in Python programming required
- Expertise on the fundamentals of electrochemistry and spin dynamics desirable
- Interest in interdisciplinary research projects and the ability to work in a cooperative manner
- Ability to show initiative and work independently in a structured, organized way
- Fluent command of written and spoken English

Our Offer:

We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We support you in your work with:

- An interesting and socially relevant topic for your thesis with future-oriented themes
- Ideal conditions for gaining practical experience alongside your studies
- An interdisciplinary collaboration on projects in an international, committed and collegial team
- Excellent technical equipment and the newest technology
- Qualified support through your scientific colleagues
- The chance to independently prepare and work on your tasks
- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work
- Flexible working hours as well as a reasonable remuneration
- Flexible work (location) arrangements, e.g. remote work

In addition to exciting tasks and a collaborative working atmosphere in Jülich, we have a lot more to offer: <https://go.fzj.de/benefits>

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.