



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 7,500 employees in one of Europe's biggest research centres and help us to shape change!

At the Institute of Climate and Energy Systems - Energy Systems Engineering (ICE-1) we focus on the optimal design and operation of integrated, decentralized energy systems with a high share of renewable energy. Computer simulation and numerical optimization are our essential tools to arrive at efficient, reliable, and cost-effective solutions. We contribute both to the development of mathematical models and to the development of improved simulation methods and optimization algorithms. Our methods and software-tools are validated against operating data of real systems. Furthermore, we conduct comprehensive case studies in order to test and further improve the scalability and the performance of our models and algorithms. Specially adapted methods and codes enable us to exploit the potential of high-performance computing with the aim of solving particularly large and complex problems.

We are looking to recruit a

Master Thesis – 1D PINN Modeling of Liquid–Liquid Separation

Your Job:

- Development of a one-dimensional physics-informed neural network (1D PINN) to model liquid–liquid separation processes
- Integration of the 1D PINN model into an existing state-estimation framework
- Extension of existing 0D lumped PINN and mechanistic models and direct comparison with these approaches
- Investigation of different separation geometries and analysis of how temperature, phase fraction, and phase heights influence separation efficiency
- Access to a 1D mechanistic model for generating synthetic data
- Availability of experimental data from a gravity settler provided by a partner institute
- Supervision from both chemical engineering and machine learning experts, ensuring strong interdisciplinary guidance

Your Profile:

- Current Master's student in Process Systems Engineering, Computational

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

Engineering Science, Chemical Engineering or a comparable course of study

- Previous experience with programming in Python
- Experience in modeling, simulation or machine learning
- Fluent / good knowledge of written and spoken English
- High degree of independence, motivation and reliability / independent and analytical working style
- Very reliable and conscientious style of working
- Excellent ability to cooperate and work in a team

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:

- **PRACTICAL RELEVANCE:** With us, you will gain valuable practical experience alongside your studies and actively participate in interdisciplinary projects
- **ONBOARDING & TEAMWORK:** You can look forward to working in a dedicated, international, and collegial team. It is important to us that you quickly settle into the team and are given structured training for your tasks. We also support you from the very beginning and make your start easier with our Welcome Days and Welcome Guide: <https://go.fzj.de/welcome>
- **SCIENTIFIC ENVIRONMENT:** You can expect excellent scientific equipment, modern technologies, and qualified support from experienced colleagues
- **SUPPORT:** Qualified support through your scientific colleagues
- **PERSONAL RESPONSIBILITY:** You organize your tasks independently—from preparation to implementation
- **FLEXIBILITY:** Flexible working hours make it easier for you to balance work and study
- **FAIR REMUNERATION:** We will pay you a reasonable remuneration for your thesis
- **CAMPUS EXPERIENCE:** Our research campus in the countryside creates ideal conditions for collegial exchange and sporting activities right on site. Our cafeteria offers a wide range of options—you can enjoy a relaxing lunch break with a lake view

The position is initially for a fixed term of 3-9 months

In addition to exciting tasks and a collegial working environment, we offer you much more: <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.

Further information on diversity and equal opportunities: <https://go.fzj.de/equality> and on specific support options: <https://go.fzj.de/womens-job-journey>