



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!

For characterisation of active photovoltaic absorber materials various advanced optical characterization methods are used to monitor photo-physical material properties. With increasing interest in research on high throughput characterization of perovskites, the need for an accelerated measurement strategy arises. In our subinstitute IMD-3, tr-PL (transient photoluminescence) measurements are commonly used to assess material properties. However, a high dynamic range is needed making the characterization method tedious and time consuming. This thesis focuses on evaluating how TCSPC (Time-Correlated Single Photon Counting) measurements at different fluences can be used to extract as much information as possible w.r.t. the information content achieved via tr-PL (transient photoluminescence) measurements. The project aims to quantify the information content (measured e.g. via Shannon entropy or Kullback-Leibler divergence) vs. measurement time.

We offer you to the next possible date an exiting

Master Thesis - Development of a TCSPC measurement strategy for optimization of information content and measurement time

Your Job:

- Literature research on /Familiarization with the topic of tr-PL and TCSPC and perovskite PV
- Familiarization with the measurement equipment and set-ups
- Qualitative measurement of the tr-PL of charge carriers in a range of perovskite samples
- Qualitative TCSPC measurements for a range of perovskite samples under varying fluences
- Quantification of the information content measured via Shannon entropy or Kullback-Leibler divergence vs. measurement time

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

- Analysis and documentation of the results

Your Profile:

- Excellent academic performance in a master's program in electrical engineering, materials science, physics, or a related field
- Basic knowledge of perovskite PV or semiconductor physics
- Initial experience in with an object-oriented programming language (e.g., Python, Matlab)
- Analytical and structured thinking
- Fluent written and spoken English or German

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:

- **MEANINGFUL TASKS:** Your thesis deals with a future-oriented, socially relevant topic with direct practical relevance in an international environment
- **SCIENTIFIC ENVIRONMENT:** You can expect excellent scientific equipment, modern technologies, and qualified support from experienced colleagues
- **HEALTH & WELL-BEING:** Your health is important to us. You can look forward to a comprehensive company health management programme with a wide range of options, including a beach volleyball court, running groups, yoga classes and much more. In addition, our company medical service and an experienced social counselling team are available to assist you on site
- **FAIR REMUNERATION:** We will pay you a reasonable remuneration for your thesis
- **FIXED-TERM:** The position is initially for a fixed term of 6 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.

The following links provide further information on diversity and equal opportunities:

<https://go.fzj.de/equality> and on specific support options:

<https://go.fzj.de/womens-job-journey>