



Ph.D. position in 3D nano-electronics

– Extension of application deadline –

Multi-photon lithography (MPL) is one of the most promising techniques for the fabrication of freeform 3D structures with nm-scale sized features^[1]. To date MPL has largely been used in photonics and biology where it has been very successful^[2]. It is anticipated that MPL can be similarly impactful in the field of electronic devices^[3,4].

We are looking for a **Ph.D. candidate** who is interested in research on 3D electronic structures and devices. The position will be based in **Prof. Stuart Parkin's Department "Nanosystems from Ions, Spins and Electrons" (NISE)** at the **Max Planck Institute of Microstructure Physics, Halle (Saale), Germany** that has significant research programs in spintronics, atomically engineered and topological magnetic materials.

YOUR TASKS

The candidate will learn to perform the following tasks:

- Design, fabrication, and characterization of 3D electronic devices, from device conception to design iteration and measurements, in collaboration with other colleagues, where necessary;
- Further improving the MPL system recently developed within NISE at the core of the 3D device fabrication workflow.

YOUR PROFILE

The candidate is expected to develop in-depth knowledge about MPL and any compatible techniques, e.g. plasma etching, sputtering, and transport measurements, as well as to apply this knowledge to the successful development of innovative, high-performance 3D electronic devices based on intrinsically 3D effects. The candidate should be highly creative, proactive, self-motivated, and capable of independent work on beyond state-of-the-art objectives. Active participation and engagement in the research activities of the group are highly desirable.

We seek candidates with:

- A background in Physics, Materials Science, Chemistry, or Engineering with knowledge in magnetism or spintronics is preferable;
- Programming skills are highly beneficial, specifically Python and/or C++;
- Experience with nanofabrication or transport measurements is beneficial.

WE OFFER

- Access to state-of-the-art facilities for 3D device fabrication and material growth;
- An open and engaging working environment addressing some of the most impactful problems in the field with the encouragement to contribute your own ideas to solve high-impact problems;
- Schedule flexibility;
- Remuneration amounting to 65% EG13 TVöD-Bund.
- Alternatively, self-funded applicants (e.g. scholarship) can also be admitted.
- All necessary training will be carried out after admission. The starting date is flexible.

YOUR APPLICATION

- For applications and any other questions, please email michael.strauch@mpi-halle.mpg.de with reference to job code **3Dnano-PhD-2023** including CV, motivation letter, and two academic reference letters **until March 31, 2023**.
- The Max Planck Institute of Microstructure Physics gives priority to applications from severely disabled candidates with equivalent qualifications. Furthermore, we strive to increase the proportion of female employees and therefore specifically encourage women to apply. For more information, please visit www.mpi-halle.mpg.de/nise

References

- [1] Zhou, X., Hou, Y. & Lin, J. *AIP Advances* **5**, 030701 (2015).
- [2] Harinarayana, V. & Shin, Y. C., *Optics & Laser Technology* **142**, 107180 (2021).
- [3] Sheka, D. D., *Appl. Phys. Lett.* **118**, 230502 (2021).
- [4] Parkin, S. S. P., Hayashi, M. & Thomas, L., *Science* **320**, 190–194 (2008).