

# **Master's Thesis in the Weil group**

## **Max Planck Institute for Polymer Research**

AK Weil, Subgroup Yingke Wu (Nanodiamond Group)

<https://sites.mpip-mainz.mpg.de/yingkewu>

**Topic:** Synthesis of Nanodiamonds using a large-volume press

Nanodiamonds (NDs) are a versatile biocompatible template to add several functionalization which make them useful for biomedical applications. Additionally, fluorescent nanodiamonds (FNDs) with an atomic lattice defect such as the negatively charged nitrogen vacancy ( $\text{NV}^-$ ) are unique tools in quantum sensing due to their electron spin properties. Bottom-up synthesis using the high-pressure high-temperature (HPHT) approach enables the transformation of carbon based materials to NDs. Treatment of different precursors under pressures up to 20 GPa and temperatures up to 2000 °C paves the way to engineered FNDs with various diameters and controllable lattice defects.



Large-volume press for ND synthesis at MPIP.

### **Candidate's tasks:**

- Synthesis of nanodiamonds from different precursors
- Preparation of HPHT experiments using a Multi-Anvil Module
- Characterization of ND products via HR-TEM, XRD & Raman

### **We offer:**

- Innovative research project with an unique machine for high pressure chemistry
- Access to several well-equipped laboratories for synthesis and characterization
- International and multidisciplinary work environment

### **We are looking for a candidate with:**

- Well-structured scientific practice
- Good English skills
- High interest in learning new synthetic strategies apart from classical wet chemistry

Start of Thesis: Mid of June 2023 or later this year.

If you are interested, please contact Christopher Ender ([ender@mpip-mainz.mpg.de](mailto:ender@mpip-mainz.mpg.de))