Max-Planck-Institut für
Struktur und Dynamik der Materie

Max Planck Institute for the Structure and Dynamics of Matter

## IMPRS UFAST Call for PhD applications 2022/2023

**HC3- Single-particle diffractive imaging**

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| **Title of PhD Project** | **Time-resolved single-particle diffraction of macromolecules using X-ray free-electron lasers** |
| **Type** | Experimental |
| **Supervisor(s)** | Prof. Henry Chapman |
| **Affiliation(s):** | UHH and DESY |
| **Number of positions:** | 1 |
| **Abstract:** | The intense X-ray pulses from free-electron lasers offer the potential to obtain structural information from macromolecules or virus particles, without the need to grow crystals or to cryogenically cool samples. This project will develop novel liquid jets in which particles are formed in small reproducible droplets. The drops contain the particles and provide a holographic reference object. These drops will be characterized by optical laser diffraction and high-speed imaging in the lab, to determine methods to control droplet size and particle doping ratios. The system will then be applied in experiments at the European XFEL on a variety of macromolecular systems that are under development in our lab and with collaborators. The project will also entail optimization of the X-ray measurements and analysis of X-ray holograms. |
| **Contact person for scientific questions about the project:** | Henry Chapman, henry.chapman@desy.de |