The Chair of Materials for Additive Manufacturing at the University of Wuppertal is now assigning a Master thesis:

{Precision Laser Ablation in Liquids via Thermal Control: Tuning Nanoparticles by Temperature}

Introduction

At the Chair of Materials Science and Additive Manufacturing we link materials science, laser processing, and particle technology from sustainable nanoparticle synthesis to additive manufacturing (AM) applications. Nanoparticles offer unique advantages: they allow us to fine-tune microstructure, improve thermal and electrical performance, and stabilize processes, which makes them valuable modifiers for alloys and composites in AM. Laser Ablation in Liquids (LAL) provides a clean way to produce such nanoparticles without complex chemical routes. In this thesis you will add an active temperature control system to our existing LAL setup and study how hot and cold conditions affect particle size, stability, and productivity, with the goal of building a clear temperature–property relationship for nanoparticle synthesis.

1) Your role

- Operate a temperature control system for the current LAL setup.
- Run experiments at different set points and record all relevant conditions.
- Test parameters such as flow rates, stabilization, and laser settings etc., and evaluate their effect on results.
- Characterize nanoparticles with methods such as UV-Vis, DLS, SEM, XRD, and Zeta potential etc.
- Analyze data using software such as OriginPro, SigmaPlot, or Python/Matlab.
- Keep a structured lab notebook and follow safety guidelines.

2) What we're looking for

- Background in materials science, nanoscience, mechanical engineering, or a related field.
- Interest in experimental lab work and data analysis.
- Enthusiasm for current research in Laser technology, Nanoparticle production, and Additive Manufacturing.
- Good communication skills in English and a careful, reliable work style.
- Ideally, some prior knowledge in Additive Manufacturing or laser-based processes.

3) What you'll gain

- Close guidance and supervision throughout the project.
- Access to modern laser facilities and advanced characterization equipment.
- Flexible working hours in a collaborative and supportive team.
- Freedom to explore and implement your own ideas, with results that contribute directly to ongoing additive manufacturing research.

Apply Now: Be part of our additive manufacturing research and explore how nanoparticles can shape future materials. We look forward to hearing from you.

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Discover more about our work at https://mam.uni-wuppertal.de .