Interested in research on Pulsed Laser Deposition (PLD)?

Become part of our thin-film technology team!

About us: SHAPING CHANGE

About 7,000 people work hand in hand at Forschungszentrum Juelich, as do 900 visiting scientists from 65 countries. We are one of the major interdisciplinary research institutions in Europe and, being a member of the Helmholtz Association, we contribute to solving the major social challenges of our time.

At our institute IEK-1 we investigate and develop materials and components for highly efficient energy conversion and storage systems. High-performance ceramics play a key role in this matter. We use our expertise in the field of synthesis of novel materials and processing methods to produce layers and bulk materials as well as numerous coating technologies from the gas phase, using state-of-the-art facilities.

Find more information on: https://www.fz-juelich.de/en

The job:

We are looking for a character who is keen on setting up - together with us - a distinct PLD work group, acting as the leader of this group, for example a young investigator group: https://www.helmholtz.de/forschung/aktuelle-ausschreibungen/auausschreibung/ helmholtz-nachwuchsgruppen-ausschreibung-2021/

Your profile:

- Completed master’s degree in materials science, physics, chemistry, engineering, or related fields, ideally a completed doctoral degree in one of the above subjects
- Excellent experimental skills and solid theoretical knowledge in the field of materials research and PLD, and preferably energy technology
- Experience with performing and documenting scientific experiments and processing and analyzing data
- Good command of writing scientific publications
- Confident communication in English and / or German language
Our offer:

- An entire PLD laboratory with a highly versatile PLD system, UV-Excimer-Laser, gas supplies, separate fume hood and work bench; the system can be operated in manual or computer-controlled mode – for details and photos of the PLD Lab see the attached flyer.
- Separate analysis chamber prepared for LEED and Auger spectroscopy.
- The lab is completely refurbished (incl. electricity supply) and equipped with an air condition system
- All necessary laser safety measures of EU/ Germany are fulfilled and personal protective gear is available
- Device manuals in English language available
- Office space
- Support by highly experienced researchers with focal point on thin-film technology
- Access to many analysis techniques in the institute and on the campus, for example scanning electron microscopy, glow-discharge optical emission spectroscopy, Raman microscopy, X-ray diffractometry, secondary ion mass spectrometry, Rutherford backscattering, nuclear reaction analysis, electrochemical impedance spectroscopy, chemical analyses.

General:

- Exciting working environment to perform high-quality research at international level
- Attractive research campus, conveniently located in the Cologne-Düsseldorf-Aachen triangle of cities
- Comprehensive training courses and individual opportunities to support personal and professional development
- Targeted services for international employees, e. g. through our International Advisory Service
- Flexible working hours in a full-time position with the option of slightly reduced working hours
- 30 days of annual leave and an attractive regulation for bridging days
- Extensive company health management
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy

Contact:

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**PLD system details:**

The PLD system (figure 1) comprises the separate 248nm-Excimer-Laser (manufacturer: COHERENT), the PLD chamber, a load lock chamber (up to 4 samples per time), a preparation chamber, a storage chamber for PLD target holders and sample holders (up to 10 holders), and a central distribution chamber for all the other chambers. The system has some free flanges (in summary eight flanges) for a future extension of the PLD system.

![Two views of the PLD system.

Ultra-high vacuum (UHV) is obtained by molecular and ion pumps/ titan sublimation pumps. A bake out system is installed, too.

Optical control of the PLD process through the viewports by computer-controlled CCD cameras.

Electronic racks are equipped with an *uninterrupted power supply* (UPS).

A RHEED analysis system (manufacturer: Staib) is installed.

Sample holders are based on the Omicron system. Target change is possible without breaking the vacuum. Samples can be heated and cooled.

INFICON deposition rate/ thickness measurement included.

Reactive processes (by addition of gases via installed mass flow controllers) is also possible.
Fig. 2: left: storage system for sample and target holder; middle: ball-pen mechanism for loading and unloading holders; right: view into the PLD chamber with sample holder and target.

Electronic components are capable of computer control (figure 3).

Fig. 3: Device user interface for computer control of the PLD system along with dialog window for graphical display of the system parameters.