

# TWO PHD CANDIDATES ON LASER MICRO PROCESSING OF POLYMERIC MEDICAL DEVICES

## Job description

The manufacturing and surface integrity associated with the micro processing of polymers for medical devices is a scientific and technical challenge. The European Marie Skłodowska-Curie ITN research project SIMPPER MedDev address these challenges and involves a consortium of 5 leading European universities, 10 industry partners who manufacture medical devices, and an orthopaedics hospital.

We are looking for two PhD-students to strengthen our research team, who will work on laser-based manufacturing for medical devices. You will be part of a cohort of 12 international, interdisciplinary and intersectoral early stage researchers and will be trained in personal, professional, academic, technical and intellectual skills.

### The PhD projects:

#### *1. Laser micro-printing of biomedical multi-materials*

Laser-induced forward transfer (LIFT) is an innovative Additive Manufacturing process in which a small volume (e.g. 5 femtolitre) of a thin donor film is transferred to a substrate via a laser beam. In this project you will study the fundamentals of, and develop strategies to, combining metals and polymers in LIFT is crucial for medical devices, as is LIFT of pure metals directly onto curved polymers with high mutual adhesion. These challenges need to be overcome to obtain high mechanical stability, reproducibility and good adhesion for medical devices.

#### *2. Laser induced periodic surface structures of polymers*

Laser processing with ultrashort pulses (in the fs and ps regime) allows for contactless structuring of surfaces on the micrometre and nanometre scale to modify (functionalise) surfaces. While fundamentals of laser-induced periodic surface structures (LIPSS) on polymers is not yet fully understood. In this project you will establish the knowledge needed to process this class of materials. You will also study the laser-induced chemical and geometric modifications of the polymer and the resulting effects on bio-compatibility.

## Your profile

- You have a Master's degree, preferably with distinction (or international equivalent) in Applied Physics, Photonics, (Mechanical or Materials or Electrical) Engineering, a closely related discipline;
- Good knowledge/demonstrated awareness of fundamental aspects of laser-material processing and applied knowledge in laser micromachining are an advantage.

- Experience in using a range of technologies/techniques for surface characterisation, e.g. SEM, EDX, AFM, etc., would be an advantage
- Ability to work in a laboratory environment and undertake experimental research.
- Good knowledge/demonstrated awareness of (numerical) modelling.
- Excellent analysis skills and an analytical mind-set, as well as excellent communication skills, including written.
- English language proficiency. If you have not graduated in a country where English is the first language, then you will need to demonstrate your English proficiency by having passed IELTS or TOEFL. The minimum overall score for IELTS is at least 6.5 with no component being below 5.5.
- Applications from suitably qualified female applicants are particularly welcome.

### **Eligibility and Mobility**

Marie Skłodowska-Curie Actions (ITN) eligibility criteria apply, in summary:

- At the time of recruitment by the University of Twente you must be in the first 4 years of your research career and have not been awarded a doctoral degree.
- You are required to undertake transnational mobility (i.e. move from another country to, in this case, The Netherlands) when taking up your appointment. That is, at the time of recruitment by the host beneficiary, you must not have resided or carried out their main activity (work, studies, etc.) in The Netherlands for more than 12 months in the 3 years immediately prior to date of recruitment.
- Researchers can be of any nationality and there is no age limit.
- For details on the above criteria point your web browser to: [https://ec.europa.eu/research/mariecurieactions/sites/mariecurie2/files/msca-itn-fellows-note\\_en\\_v2.pdf](https://ec.europa.eu/research/mariecurieactions/sites/mariecurie2/files/msca-itn-fellows-note_en_v2.pdf)

### **Our offer**

- A four-year fulltime PhD position.
- We provide a stimulating, modern research environment with world-class research facilities. And we provide excellent mentorship and a stimulating research environment to accelerate your further professional and personal growth.
- A starting salary of €2395,- gross per month in the first year and increasing to €3061,-gross per month in the fourth year.
- An annual holiday allowance of 8% of the gross annual salary, and an annual year-end bonus of 8.3%.
- A solid pension scheme.
- 41 leave days in case of full-time employment.
- The University of Twente is situated on a green and lively campus with lots of facilities for sports and other activities.

### **Information and application**

Additional information about this position can be obtained from the website of the Chair of Laser Processing: <https://www.utwente.nl/en/et/ms3/research-chairs/lp/> and/or

prof.dr.ir. G.R.B.E. Römer, department of Mechanics of Solids, Surfaces & Systems (MS3), Chair of Laser Processing, University of Twente, see for contact details: <https://www.utwente.nl/en/et/ms3/research-chairs/lp/RomerGRBE/RomerGRBE/>

Submit your application no later than **April 5th, 2021**, using the “apply now” button on the website: <https://www.utwente.nl/en/organisation/careers/!/2021-274/two-phd-candidates-on-laser-micro-processing-of-polymeric-medical-devices>

Please upload your application, including:

- A full Curriculum Vitae, including a list of all courses attended and grades obtained, references and, if applicable, a list of publications.
- A Motivational letter (maximum 1 page A4), emphasizing your specific interest, qualifications, motivations to apply for this position and research ideas for the PhD project.
- Also confirm that you meet the “Eligibility and Mobility Marie Skłodowska-Curie” actions (ITN) as listed above.

A Game-Based assessment will be also part of the selection procedure.

## About the organization

The Faculty of Engineering Technology (ET) engages in education and research Mechanical Engineering, Civil Engineering and Industrial Design Engineering with a view to enabling society and industry to innovate and create value using sound, efficient and sustainable technology. We are part of a ‘people-first’ university of technology, taking our place as an internationally leading centre for smart production, processes and devices in five domains: Health Technology, Maintenance, Smart Regions, Smart Industry and Sustainable Resources. Our faculty is home to some 1,800 Bachelor’s and Master’s students, 400 employees and 150 PhD candidates and offers three degree programmes: Mechanical Engineering, Civil Engineering and Industrial Design Engineering. Our educational and research programme are closely connected with UT research institutes Mesa+ Institute, TechMed Centra and Digital Society Institute.

As an employer, the ET Faculty offers jobs that matter. We equip you as a staff member to shape new opportunities both for yourself and for our society. With our Faculty, you will be part of a leading tech university that is changing our world for the better. We offer an open, inclusive and entrepreneurial climate, in which we encourage you to make healthy choices, for example, with our flexible, customizable conditions.

### University of Twente (UT)

University of Twente (UT) has entered the new decade with an ambitious, new vision, mission and strategy. As ‘the ultimate people-first university of technology’ we are rapidly expanding on our High Tech Human Touch philosophy and the unique role it affords us in society. Everything we do is aimed at maximum impact on people, society and connections through the sustainable utilisation of science and technology. We want to contribute to the development of a fair, digital and sustainable society through our open, inclusive and entrepreneurial attitude. This attitude permeates everything we do and is present in every one of UT’s departments and faculties. Building on our rich

legacy in merging technical and social sciences, we focus on five distinguishing research domains: Improving healthcare by personalised technologies; Creating intelligent manufacturing systems; Shaping our world with smart materials; Engineering our digital society; and Engineering for a resilient world.

As an employer, University of Twente offers jobs that matter. We equip you as a staff member to shape new opportunities both for yourself and for our society. With us, you will be part of a leading tech university that is changing our world for the better. We offer an open, inclusive and entrepreneurial climate, in which we encourage you to make healthy choices, for example, with our flexible, customisable conditions.