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# 15 Doctoral Researcher (FELLOW) 3-year PhD positions

## **TRADES** - "Training & Research in Advanced Dispersion Engineered grating-waveguide Structures"

| | |
|---|---|
| **Organization/company:** | Institutions across Europe in the TRADES Doctoral Network |
| **Research field:** | Physics > Optics > Laser applications, Optical engineering, Metrology and measurement |
| **Researcher profile:** | First Stage Researcher (R1) |
| **Application deadline:** | **February 15, 2026 00:00 (CEST)** |
| **Type of contract:** | Temporary |
| **Job status:** | Full-time |
| **Hours per week:** | 35-40 |
| **Offer starting date:** | July 1 – September 1, 2026 |
| **EU research framework program:** | Horizon Marie Skłodowska-Curie Actions 2024<br>MARIE CURIE (MSCA-DN) |
| **Grant agreement number:** | 101226599 |

We are pleased to advertise 15 Doctoral Researcher (PhD) positions to begin in 2026, as part of the Doctoral Network of the European Commission TRADES "Training & Research in Advanced Dispersion Engineered grating-waveguide Structures". The positions will each last three years, and will allow all students to participate in an exciting program comprising international schools, workshops, and secondments at academic, as well as industrial partners (see the overview of the project below).

**Important:** Please review the webpages of the individual vacancies via the IFSW website for details:
https://www.ifsw.uni-stuttgart.de/en/institute/vacancies/

## Overview of the project and of the training offered to all Doctoral Researchers of TRADES

The TRADES doctoral training network aims to address a skills gap in the photonics sector by training a cohort of 15 doctoral candidates with the advanced skills necessary for the development of innovative and enabling photonics components.

The network will deliver a research and training program focused on key steps in product development – from concept, through sustainable production and precise characterization, right up to implementation. It will also equip the doctoral candidates with the interdisciplinary skills necessary to drive the research forward.

The network fellows will design and develop robust dispersive components based on sub-wavelength gratings waveguide structures to produce gratings for both intra-cavity and extra-cavity applications in high power lasers operating in the 1 and 2 µm spectral regions. To do so, the fellows will push state-of-the-art deposition, lithographic, and etching techniques to their limits, and explore how they can be used to optimize the manufacturability, efficiency (>99.9%) and LIDT > 1J/cm2 for sub-ps pulses, of the final gratings.

In parallel, the fellows will be provided with non-academic research exposure and training in innovation management, enterprise, and entrepreneurship in a highly integrated format beyond the normal generic skills training. This will contribute to producing highly sought after graduates, who are capable of inventing, innovating, and converting knowledge into products and services for economic benefit and are fluent in the business planning and innovation management aspects of their research. All this will prepare the fellows for future careers in photonic technology research and development.

| **Host institutions** | **PhD positions** |
|---|---|
| Universität Stuttgart (USTUTT) | 3 PhD positions, Fellows 1 (IFSW), 2 (IFSW), and 3 (ITO) |
| University of Southampton (ORC) | 2 PhD positions, Fellows 4 & 5 |
| École centrale de Marseille (IF) | 2 PhD positions, Fellows 6 & 7 |
| University of Eastern Finland (UEF) | 2 PhD positions, Fellows 8 & 9 |
| Université Jean-Monnet, Saint-Étienne | 2 PhD positions, Fellows 10 & 11 |
| Fyzikální ústav Akademie věd České republiky (FZU) HiLASE | 2 PhD positions, Fellows 12 & 13 |
| Leibniz-Institut für Oberflächenmodifizierung (IOM: Leibniz Institute of Surface Engineering) | 1 PhD position, Fellow 14 |
| Université de Liège | 1 PhD position, Fellow 15 |

The TRADES consortium also includes academic partner organizations:

- Tampere University TAU
- Czech Technical University CTU
- Technische Universität Dresden TUD

And private sector partners:

- FIBERCRYST SAS
- TRUMPF LASER GMBH
- AMPLITUDE SYSTEMES SA
- Dausinger + Giesen GmbH
- BÜHLER ALZENAU GmbH
- CRYTUR
- Neue Technologien GmbH / Co. KG.NTG
- MODUS Research and Innovation Ltd.
- SOLNIL
- European Photonics Industry Consortium EPIC

Interested applicants are strongly encouraged to contact the scientists in charge of the projects as soon as possible.

## Available projects:

Details of each project can be found below or via the IFSW website:
https://www.ifsw.uni-stuttgart.de/en/institute/vacancies/

## Summary of titles and host institutions for the 15 PhD positions:

**FELLOW 1** (IFSW, Stuttgart, Germany):
Design and characterization of novel, highly tolerant and robust dispersive devices based on grating-waveguide structures.

**FELLOW 2** (IFSW, Stuttgart, Germany):
Design and implementation of a compact grating compressor for high-power 1-micron lasers.

**FELLOW 3** (ITO, Stuttgart, Germany):
Fabrication and characterization of pulse compression gratings using SBIL.

**FELLOW 4** (ORC, Southampton, England):
Fabricating dielectric all-crystalline GTI-like GWS

**FELLOW 5** (ORC, Southampton, England):
Fabricating GTI-like GWS on a silicon platform

**FELLOW 6** (IF, Marseille, France):
High performance optical coatings for resonant grating structures

**FELLOW 7** (IF, Marseille, France):
Laser damage resistance of materials and structures of pulse compressor GWS

**FELLOW 8** (UEF, Joensuu, Finland):
Direct electron beam writing of pulse compressor GWS for high-power laser systems

**FELLOW 9** (UEF, Joensuu, Finland):
Electron beam writing of master's for NIL of high-power laser system pulse compressor GWSs

**FELLOW 10** (LabHC, Saint-Etienne, France):
Sol-gel based functionalized thin layer for direct grating printing

**FELLOW 11** (LabHC, Saint-Etienne, France):
Large grating printing using phase mask based dynamic lithography

**FELLOW 12** (FZU HILASE, PRAGUE):
Implementation of highly tolerant dispersive devices based on grating-waveguide structures in high power lasers at 1 and 2- micron

**FELLOW 13** (FZU HILASE, Prague, Czech Rep.):
Characterization of novel and highly tolerant dispersive devices based on grating-waveguide structures

**FELLOW 14** (IOM, Leipzig, Germany):
Advanced Technologies for reactive ion beam etching of pulse compression grating

**FELLOW 15** (ULIEGE, Liège, Belgium):
Environmental footprint evaluation of grating waveguide structures in view of their eco-design, including criticality analysis

## Additional information

The successful candidates will receive a 36-month, full-time employment contract as per Marie Skłodowska-Curie Actions (MSCA) regulations for doctoral researchers. The monthly salary will be confirmed upon offer, paid in the currency of the host country, and with a correction factor applied to the host country. The approximate monthly salary before employer and statutory deductions is €4,736 (France); €4,058 (Germany); €4,732 (Finland); €5,682 (UK), €3.774 (Czech Rep.), and €4.010 (Belgium), plus an additional mobility allowance of €710/month. Researchers may also qualify for a family allowance of €495/month depending on family situation at the time of recruitment. Please visit the EU MSCA website for further information.

The fellows will be enrolled in an exciting PhD program of leading academic and industrial researchers. In addition to their individual scientific projects, all fellows will benefit from a dedicated training program comprising an integrated curriculum of local and intensive network courses, schools, workshops and engagement with cutting-edge research.

## Eligibility criteria

There are strict eligibility requirements within Marie Skłodowska-Curie Doctoral Networks. At the time of appointment, applicants must not have resided or carried out their main activity (work, studies) in the country for more than 12 months in the 3 years immediately before their appointment; AND shall also be in the first four years of their research careers at the time of appointment and have not been awarded a doctoral degree.

## Offer Requirements, Skills and Qualifications

- Must have Masters (or equivalent) degree in Mechanical Engineering, Mathematics, Physics, or Photonics, with solid knowledge of optics and its applications.
- Must be in the first 4 years of his/her career, measured from the date of graduation (MSc degree or equivalent).
- Should not hold a PhD degree.
- Should not have resided or carried out their main activity (work, studies) in the country of their appointment for more than 12 months in the 3 years immediately before their appointment. For refugees under the Geneva Convention, the refugee procedure (i.e. before refugee status is conferred) will not be counted as ‘period of residence/activity in the country of the beneficiary’.
- Must be able to communicate fluently in English, in oral and written form.
- Willingness to travel for secondments and collaborative activities within the TRADES network.

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## Selection process

Applicants will need to submit to trades@ifsw.uni-stuttgart.de, for each application:

- Brief description of why the applicant wishes to become a PhD student within TRADES (Letter of motivation).
- Copy of transcripts and of their Bachelor and Master degrees, and a copy of master's thesis and any other publications (if available).
- Curriculum vitae of three pages maximum.
- Two written recommendation letters (e.g. one by the former Master thesis supervisor and their referees contact details).

## Job description

## FELLOW 2 (IFSW, Stuttgart, Germany):

## Design and implementation of a compact grating compressor for high-power 1-micron lasers.

In this project, the selected doctoral candidate (DC) will focus on three main tasks:

- First, the DC will the design, build up and full characterization of a high-power (kW-Class) CPA-based thin-disk multipass amplifier using a novel, compact and patented pulse-compressor stage using the GWS developed in TRADES. An important part of the work of the DC will be dedicated to the full modelling, design and build-up of the compressor stage.
- Second, the DC will design and setup a thin-disk mode-locked oscillator in which the GTI-like GWS developed by *DC4* and *DC5* (ORC) will be qualified. Laser induced damage threshold (LIDT) in collaboration with *DC7* experiments at high-average power and >100KHZ repetition rate will also be part of the tasks.
- Furthermore, the DC will support *DC12* in the implementation of the novel compressor stage for the 2-micron wavelength lasers and will assist DC13 for the LIDT measurement of the GWS at 2-micron wavelength.

**Specific requirements:** Solid background in optics and laser physics, strong knowledge in programming or simulation tools (e.g. MATLAB, python or C), practical experimentation with optics and lasers.
Ability to work in team.

At the University of Stuttgart, we actively promote diversity among our employees. We strongly encourage applications from qualified candidates of all backgrounds, including those from underrepresented groups. Learn more about The University of Stuttgart as an employer on our website: www.uni-stuttgart.de/en/university/employer/.
We welcome any good application and are looking forward to yours!