

25/03/2020



# ESR6: PhD Student Position at Robert Bosch GmbH within EU MSCA-ITN-ETN NewFrac

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## Where to apply

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Application Deadline: 30/06/2020 17:00 - Europe/Brussels

## Contact Details

**Where to send your application.**

### COMPANY

Robert Bosch GmbH

### WEBSITE

<https://www.newfrac.eu/application-form>

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## Hiring/Funding Organisation/Institute

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### ORGANISATION/COMPANY

Robert Bosch GmbH

### COUNTRY

Germany

### DEPARTMENT

Corporate Sector Research and Advance  
Engineering - Applied Material and  
Manufacturing Technologies for Metals and  
Polymers

### CITY

Renningen

### ORGANISATION TYPE

Large Company

### WEBSITE

<https://www.bosch.com/research/>

**ORGANISATION/COMPANY**

Robert Bosch GmbH

**LOCATION**

Germany › Renningen

**RESEARCH FIELD**

Engineering › Mechanical engineering

**TYPE OF CONTRACT**

Temporary

**RESEARCHER PROFILE**

First Stage Researcher (R1)

**JOB STATUS**

Full-time

**APPLICATION DEADLINE**

30/06/2020 17:00 - Europe/Brussels

**HOURS PER WEEK**

40

**OFFER STARTING DATE**

01/11/2020

**EU RESEARCH FRAMEWORK PROGRAMME**

H2020 / Marie Skłodowska-Curie Actions

**REFERENCE NUMBER**

NEWFRAC

**MARIE CURIE GRANT AGREEMENT NUMBER**

861061

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The Marie Skłodowska-Curie Innovative Training Network "**NEWFRAC**" ([www.newfrac.eu](http://www.newfrac.eu)) is a high-level training of a new generation of creative, entrepreneurial and innovative early-stage researchers (ESRs) through the development and engineering applications of a new modeling framework focused on the prediction and analysis of multi-field fracture phenomena in heterogeneous engineering systems at different scales. NEWFRAC in its mission of training students capable of solving the current problems of multi-field fracture phenomena in heterogeneous engineering systems, offers **13 PhD positions** for early stage researchers (**ESRs**) distributed in a network of 65 European countries (**France, Germany, Italy, Portugal and Spain**) and 2 countries associated (**Israel and Switzerland**), with the participation of prestigious academic and industrial institutions that will allow researchers to grow and develop their technical skills in a multisectoral environment.

Besides working on their project at their home institutions, the researchers will participate in network-wide training events like summer schools. Moreover, they will conduct secondments at other network partners combining academic and industrial experiences.

The following position and project is available at **Robert Bosch GmbH in Renningen, Germany**:

### **ESR 6: Multiscale modeling of fracture processes in injection molded SFRPs**

**Objectives:** *Components made of SFRP are typically manufactured via injection molding. Hereby, the resulting local microstructural configuration of the composite, i.e. the spatial arrangement of the fibers, highly influences the deformation and failure behaviour of the macroscopic component. Later in the application, products are exposed to harsh environments and severe operational loads. Aiming at the development of products with high reliability requirements in a time- and cost-efficient manner, simulation methods with high accuracy predictions and efficient adaptation routines are becoming increasingly important. To achieve this, robust multiscale techniques must be established that contain elements of virtual material testing where a large portion of the required experiments are transferred to the virtual or numerical world. Clearly, this requires a model on the microscopic scale that captures all relevant failure mechanisms like fiber fracture, cavitation fracture at fiber tips, and matrix fracture. In this context, PF models for fracture are promising approaches, as they can be employed to describe highly complex fracture processes in very complicated 3D microstructures. With precise microscopic models at hand that are validated with non-standard microscopic experiments, numerous simulations are performed with highly efficient Fast Fourier Transformation (FFT) solvers. In line with concepts of data-driven modeling strategies, effective material laws for the macroscopic component scale are derived based on closed form approaches or on modern model order reduction techniques which are fed by the previously performed microstructural simulations. The 1st objective of this ESR project is to deliver variational-based robust PF models for fracture that can be employed to predict damage progression on the microstructural level for complex operational loads. In order to achieve this, experiments on the microscale of the composites will be carried out to make the main failure mechanisms visible and to motivate the specific PF modeling approaches. Having the microscopic model at hand, the 2nd objective of this ESR project is the derivation of a suitable effective model that can be employed for component simulations that are performed with commercial FEM packages. For more information about this position please go to <https://www.newfrac.eu/phd-positions/esr6>*

Contract signing and incorporation dates are orientative and have yet to be defined. For **more information** about the call and application process visit [www.newfrac.eu](http://www.newfrac.eu)

### ADDITIONAL INFORMATION

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## Benefits

A full-time fixed-term contract is offered. Marie Curie ITNs provide competitive financial support to the ESR including: a competitive monthly living and mobility allowance and salary, coverage of the expenses related to the participation of the ESR in research and training activities (contribution to research-related costs, meetings, conference attendance, training actions, etc.). The recruited researchers will have a regular contract with the same rights and obligations as any other staff member of the institution.

## Eligibility criteria

Applicants must at the time of recruitment: **1)** Be in the first four years (full-time equivalent) of their research careers. The four years start to count from the date when a researcher obtained the degree (e.g. Master's degree) which would formally entitle him/her to embark on a doctorate. **2)** Candidates could be of any nationality but have not resided in the host country for more than 12 months in the last 3 years **3)** Have NOT been awarded a doctoral degree.

## Selection process

Applicants are evaluated by a selection committee on the basis of past academic performance (grades) and background, scientific relevance and aptitude to research, and any other additional pertinent data submitted in the application (such as scientific publications, if any). The candidates that pass the initial assessment of the applications will be invited for an interview with the selection committee, either in person at the campus, or via standard internet videoconference. Equal opportunities are ensured to all candidates throughout the evaluation process.

## Web site for additional job details

<https://www.newfrac.eu/application-form>

## REQUIREMENTS

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### Offer Requirements

#### **REQUIRED EDUCATION LEVEL**

Engineering: Master Degree or equivalent

#### **REQUIRED LANGUAGES**

ENGLISH: Excellent

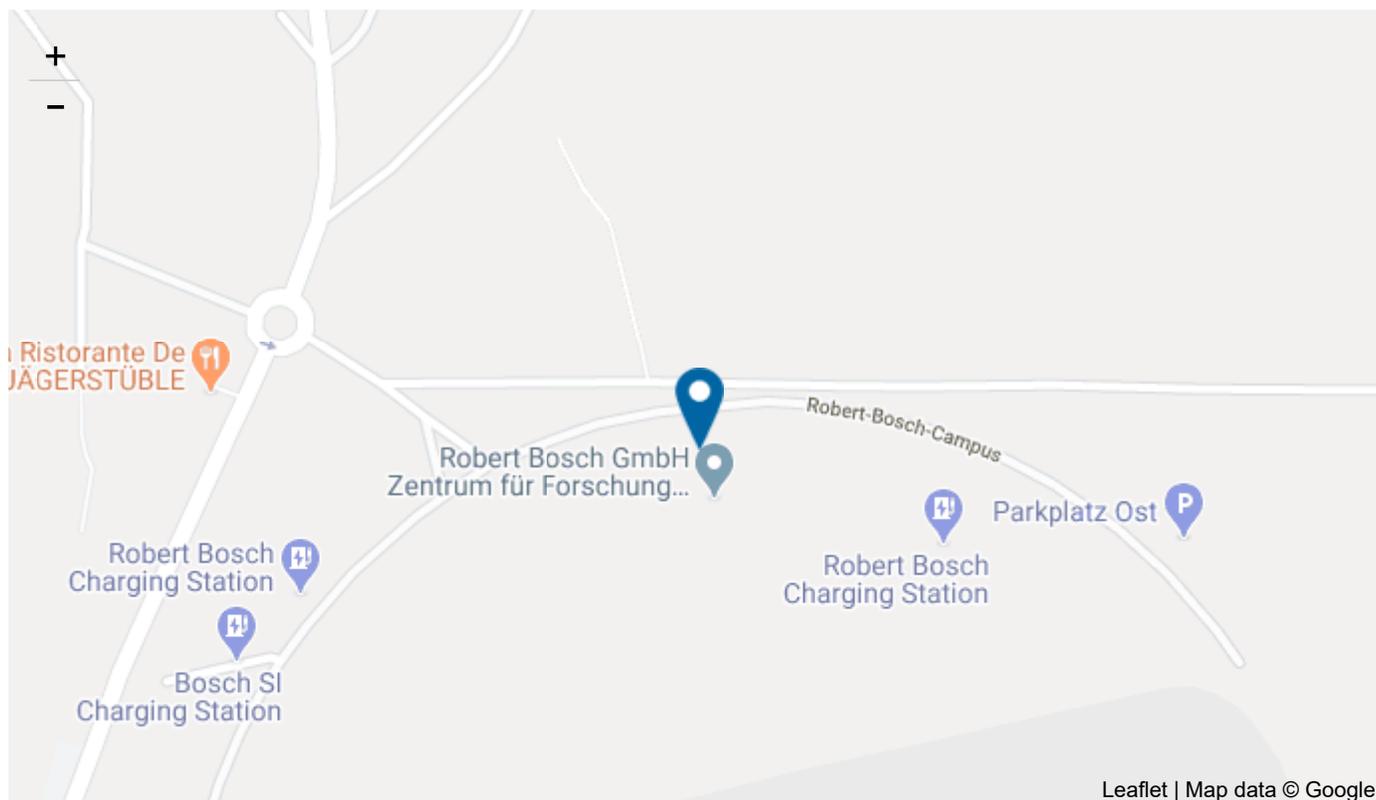
## Skills/Qualifications

- Master's degree in Mechanical/Aeronautical/Civil Engineering/ Physics/ Applied Mathematics, earned before June and September
- Excellent undergraduated and Master's degree grades
- High level of written and spoken English
- Teamwork ability

## Specific Requirements

- Previous experience in the development and application of Finite Element Method and at least one programming language will be appreciated

# Map Information



## WORK LOCATION(S)

1 position(s) available at  
Robert Bosch GmbH  
Germany  
Renningen  
Robert-Bosch-Campus, 71272  
Renningen

EURAXESS offer ID: 508099

## Disclaimer:

*The responsibility for the jobs published on this website, including the job description, lies entirely with the publishing institutions. The application is handled uniquely by the employer, who is also fully responsible for the recruitment and selection processes.*

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