מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

FiBreMoD

Weizmann Institute of Science
Department of Materials and Interfaces

PhD Studentship in Microscale matrix and interfacial properties of fibre-reinforced composites

Applications are invited for a 3-years research position in the field of microscale measurements of fiber, matrix, and interfacial mechanical of fibre-reinforced composites, leading to the award of a PhD degree. The post is supported by an allowance provided by the European Union. Candidates must fulfil the eligibility criteria for this award: (i) not residing in Israel for at least 24 months in the last 3 years, and (ii) having less than 4 years of research experience.

This position is part of FiBreMoD (*Fibre break models for designing novel composite microstructures and applications*), an Innovative Training Network with 6 academic and 6 industrial partners in Belgium, UK, France, Germany, Israel and Netherlands. FiBreMoD's goal is to train 13 researchers to become multi-talented and interdisciplinary experts in understanding, characterising and predicting failure of fibre-reinforced composites. Such researchers will be highly coveted by industries using lightweight materials (e.g. aeronautics, automotive, energy), which currently overdesign components due to a lack of reliable design methods for composites.

The key challenges of this PhD project are to manufacture microscale thermoset fibres with and without molecular alignment and with controlled curing degree, to establish a reliable methodology for measuring microscale matrix properties, to improve the reduction schemes for measuring interfacial adhesion and its variability. One especially interesting aspect will be to establish the effect of non-uniform interfacial structure and intermittent adhesion on the strength and toughness of microcomposites. The work requires a background in Materials Science and Mechanics, and Chemistry/Chemical Engineering. The project will include both modelling and experiments. The position includes 2-months secondments at KU Leuven (to gain insight into reduction schemes for single fibre tests - with Dr. Larissa Gorbatikh) and at Dia-stron (to develop knowledge on automated methods for microscale measurements – with Yann Leray).

During this PhD project, the research student will:

- Develop a reliable methodology for measuring microscale matrix properties;
- Improve a reduction scheme for deducing fibre strength distribution from single fibre fragmentation tests;
- Assess the influence of interface strength variability on failure development;
- Participate in the dedicated training programme organised by FiBreMoD (including technical, communication, career management and business skills), and in bi-annual project meetings;
- Write scientific papers for publication in top-level journals in Materials Science and Mechanics.
- Present his/her research in project meetings, international conferences and outreach events;
- Work in close collaboration with the supervisors, while being the driving force for his/her own PhD.

The successful applicant will be an enthusiastic and self-motivated person who meets the academic requirements for enrolment for the PhD degree at the Weizmann Institute. Eligible applications will be assessed on the applicant's (i) academic qualifications, (ii) background on materials science/Chemistry/Physics, (iii) technical skills, (iv) communication skills, and (v) motivation for the project. Female applicants are strongly encouraged to apply.

For general information on the PhD process at the Weizmann Institute, please go to https://www.weizmann.ac.il/feinberg/admissions/about-phd-program

For further details please contact Professor Daniel Wagner: daniel.wagner@weizmann.ac.il. Interested applicants should send an up-to-date curriculum vitae (see check-list in next page) to Prof. Wagner at the above e-mail address.

Closing date: until filled

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CHECK-LIST FOR THE APPLICANTS (information to accompany your CV)

√	I fulfill the mobility criteria for this position, and I have not been a resident in Israel for at least 24 months in the last 3 years.	*Detail country(ies) of residence since 2012.*
√	I do not have more than 4 years of experience as a researcher.	*Provide details of any past or present employment.*
√	I have (or am about to obtain) a degree in Materials Science, Composites Mechanics, or Chemistry/Chemical Engineering.	*Provide details, and enclose full transcripts.*
√	I have done research work in the field of materials modelling.	*Provide details, and enclose a written project report.*
√	I understand the project description and it interests me.	*Enclose a one-page comment on the project, relating it to your own experience, education and career goals.*
√	I speak and write good English.	*Illustrate it in your application.*