Faculty of Engineering

HORIZON EUROPE Research and Innovation Framework Programme
MARIE SKŁODOWSKA-CURIE ACTIONS

INVITATION TO APPLY FOR
POSTDOCTORAL FELLOWSHIPS 2022

Organisation Name/ Department	Czech University of Life Sciences Prague/Faculty of Engineering, Department of Material Science and Manufacturing Technology
Website of the organisation	https://www.tf.czu.cz/en https://www.facebook.com/tf.czu.cz https://www.instagram.com/tfczucz/
Research Fields	☐ Chemistry (CHE) ☐ Social Sciences and Humanities (SOC) ☐ Economic Sciences (ECO) ☒ Information Science and Engineering (ENG) ☐ Environment and Geosciences (ENV) ☒ Life Sciences (LIF) ☐ Mathematics (MAT) ☐ Physics (PHY)
Sub-Fields/ Keywords	fiber reinforced composites, prediction of mechanical performance, nanoscale fillers in composites, hybrid adhesive bonds, bio-composites
Marie Skłodowska-Curie Action(s) of interest	☒ **European Postdoctoral Fellowships (***European nationals or long-term residents working on R&I projects with organisations outside EU Member States and Horizon Europe Associated Countries.*

	***Duration**: 24-36 months (12-24 months outgoing phase in a non-associated Third Country (TC) & 12 months mandatory return phase to a host organisation in Europe).* ☒ **Global Postdoctoral Fellowships** (*researchers of any nationality working on R&I projects by either coming to Europe from any country in the world or moving within Europe* ***Duration**: 12-24 months*).
Short Description of the Organisation/ Department	**DESCRIPTION OF THE ORGANISATION/ DEPARTMENT:** **Expertise:** The department of Material Science and Manufacturing Technology is well equipped with state-of-the-art machinery and equipment for development, testing, microscopy and characterization of fiber reinforced composites. Further, the computational tools for modeling and prediction of mechanical performance are also available. The research team is highly experienced in this area and has recently participated in many significant research projects. **Research team composition:** 1. DOC. RAJESH KUMAR MISHRA, PH.D. (CZU, CZ) 2. PROF. ING. MIROSLAV MULLER, PH.D. (CZU, CZ) 3. ING. MONIKA HROMASOVÁ, PH.D. (CZU, CZ) 4. ING. VIKTOR KOLAR, PH.D. (CZU, CZ) 5. DOC. ING. MICHAL PETRU, PH.D. (TUL, CZ) 6. PROF. BIJOYA KUMAR BEHERA, PH.D. (IIT DELHI, IND) 7. PROF. PRASAD POTLURI, PH.D. (MANCHESTER, UK) **Strengths and scientific achievements:** ✓ Publication of numerous articles in reputed scientific journals e.g.: Composites B, Polymers, Journal of Natural Fibers, Journal of Industrial Textile, Wear, Tribology International, etc. ✓ Product prototypes used in related industries especially in automotive, agricultural, defence, construction fields. **Important infrastructure:** ✓ mechanical testing and evaluation under tensile, bending, compression, impact mode ✓ scanning electron microscopy ✓ nanoscale mechanical evaluation ✓ tribology, vacuum infusion ✓ granulation line ✓ plastic injection moulding, hardness measuring ✓ temperature and degradation chambers

	✓ CNC cutting by water jet technology ✓ particle analyser
Previous Projects/ Research Experience	1. Hybrid Materials for Hierarchical Structures (HyHi, Reg. No. CZ.02.1.01/0.0/0.0/16_019/0000843), Ministry of Education, Youth and Sports, Czech Republic. 2. Modular platform for autonomous chassis of specialized electric vehicles for freight and equipment transportation", Reg. No. CZ.02.1.01/0.0/0.0 /16_025/0007293, Ministry of Education, Youth and Sports, Czech Republic. 3. Research services, design, development & supply of advanced insulation materials, DEBEL/MMG/PO/FE/DEB-110/03/2013-14, Ministry of defence, Govt. of India. 4. Development of prototype of alcohol-fuelled LTAIN19029, MSMT, INTER-EXCELLENCE CR-Indie 5. R&D of working tools of agricultural machines, TA04021078, Technology Agency of the Czech Republic 6. Research and development of wear-resistant materials and technologies for their use at agricultural machines TA01010192, Technology Agency of the Czech Republic
Thematic areas and a list of supervisors who are going to participate in preparing a project proposal with postdoctoral researchers.	**Thematic area:** Development and characterization of fibrous geometries for composite reinforcement: computational modeling and experimental validation **Supervisor:** doc. Rajesh Kumar Mishra, Ph.D. • **Current position:** docent (Associate professor) • **Professional profile:** ✓ Number of published papers: 172 ✓ *Hirsch index – Web of Science (23), Scopus (25)* ✓ *Membership of a scientific org./boards – Member of textile bioengineering and informatics society, Institute of Engineers (India), Textile Institute (Manchester).* ✓ *Awards – Outstanding young researcher award from textile bioengineering and informatics society - 2019* ✓ *Number of promoted PhD students etc.*- 5 (successfully defended theses), 1 continuing

- **Professional experience:**

✓ *2019- present – Associate professor (docent) at Faculty of Engineering, Czech university of Life Sciences Prague.*

✓ *2013 - 2019 - Associate professor (docent), Technical University of Liberec, Faculty of Textile Engineering*

✓ *2009 - 2013- Assistant professor, Technical University of Liberec, Faculty of Textile Engineering*

✓ *2006 - 2009 – Research & Development Manager in Indian Textile Industry*

✓ *2003 - 2006 – Research Fellow at IIT Delhi*

✓ *1998 - 2003- Lecturer in Textile Engineering at Utkal University, INDIA*

- **Titles and education:**

✓ *2013 - docent, habilitation in textile technics and material engineering from Technical University of Liberec, Czech Republic.*

✓ *2006 - PhD with thesis titled "High quality woven fabric design engineering" from IIT, Delhi, India.*

✓ *1998 - B.Tech. from Textile faculty in Utkal University, India.*

Specialization: *Fiber reinforced composites, green composites, biological fillers for composites, nanocomposites, biomechanical engineering of fibrous structures, thermo-mechanical characterization of materials, thermal behavior of textile structures etc.*

Team members

1. **Team member: prof. Ing. Miroslav Müller, Ph.D.**

Specialization: *Polymer composite materials, hybrid adhesive bonds, material use of secondary renewable raw materials, i.e. waste, wear, material machining - waterjet technology.*

2. **Team member: Ing. Monika Hromasová, Ph.D.**

Specialization: *Scanning Electron Microscopy, Evaluation of fracture and morphology*

	3. **Team member: Ing. Viktor Kolář, Ph.D.** **Specialization:** *Mechanical characterization, quasi static testing, cyclic loading and evaluation of composites* 4. **Team member: doc. Ing. Michal Petrů, Ph.D.** **Specialization:** *Fiber reinforced composite, modeling and simulation, robotic winding, autonomous vehicles.* 5. **Team member: prof. Bijoya Kumar Behera, Ph.D.** **Specialization:** *Textile structural composites, Computational modeling, woven architecture* 6. **Team member: prof. Prasad Potluri, Ph.D.** **Specialization:** *Textile reinforced composites, braiding, numerical modeling*
Short description of Postdoctoral Fellowships programme	✓ The activities of the postdoctoral researcher will be focused on fiber reinforced composite materials. ✓ Computational tools e.g. FEM or FVM will be used to define the geometry of fiber based reinforcement structures. ✓ The mechanical performance with respect to maximum stress and strain levels will be predicted. ✓ The adhesive bonds and interfacial performance will be evaluated experimentally. ✓ Scanning electron microscopy will be used to analyze the internal structure and fracture in composite samples. ✓ Mechanical characterization of composite samples with respect to tensile, bending, compression and impact performance will be carried out. ✓ Cyclic loading behaviour will be investigated for developed samples. ✓ The study of degradation under varying conditions will be conducted. ✓ The thermomechanical performance will be studied using Dynamic mechanical analysis (DMA) and thermogravimetric analysis (TGA). ✓ Inclusion of nanoscale fillers in composites will be studied in detail. ✓ Possibilities of using bio-based fibers and fillers in hybrid composites will be explored. ✓ The postdoctoral researcher will be actively involved in modeling, sample development, characterization and evaluation of results.

	✓ Preparation of articles for publication in reputed scientific journals.
Contact Person/ Position in the Organisation/ Phone/ E-mail	Pavlina Ruzickova project manager email: ruzickova@tf.czu.cz phone: + 420 605 294 906
Deadline for Expressions of Interest from postdoctoral researchers	28 February 2022
Necessary documents from applicants	✓ CV ✓ List of publications ✓ Brief description of the project idea (a *project proposal will be made jointly by the researcher and a host institution*)
What we offer	✓ Full-time contract to work on a research project and enjoy advanced training, ✓ Competitive salary – (€ 5 080*0.791) = gross amount, including compulsory deductions under national law, such as employer and employee social security contributions and direct taxes; ✓ Mobility (€ 600) and Family allowances (if applicable - € 660); ✓ Budget for Research, Training and Networking costs (€ 1 000); ✓ Special needs allowance (if applicable).
Eligibility of Applicants	**Experience:** ✓Applicants should be in a possession of a doctoral degree at the call deadline (applicants who have successfully defended their doctoral thesis but who have not yet formally been awarded the doctoral degree will also be considered eligible to apply). ✓At the call deadline, supported researchers must have a maximum of 8 years full-time equivalent experience in research, measured from the date of award of the doctoral degree (exceptions that will not count towards the amount of research experience: career breaks, work outside research, research outside Europe for reintegrating researchers). **Mobility rule:** ✓researchers of any nationality ✓European Postdoctoral Fellowships - applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the beneficiary for more than 12 months in the 36 months immediately before the call deadline, ✓Global Postdoctoral Fellowships - applicants must not have resided or carried out their main activity (work,

	studies, etc.) in the country of the host organization for the outgoing phase for more than 12 months in the 36 months immediately before the call deadline. ✓ Researchers reintegrating from a TC must either be based in a TC at the call deadline or have moved directly from a TC to an EU MS or HE AC within the last 12 months before the call deadline.
Additional Funding Opportunity	**ERA Fellowships** ✓ It is open to researchers of any nationality who wish to engage in R&I projects by either coming to Europe from any country in the world or moving within Europe to a Widening Country. ✓ In order to apply for the ERA Fellowships call, applicants need to submit their proposal to the 2021 MSCA PF call. ✓ To be eligible to this call the host organisation must be located in an eligible widening country. ✓ The application to the MSCA PF call will be automatically resubmitted to this call-in case the proposal fails to reach an adequate place in the ranking to be funded.