Hosting offer for Marie Sklodowska-Curie Postdoctoral Fellowships (PF) 2022 at University of Rijeka

[MSCA Postdoctoral Fellowships](#) are individual research grants offering excellent postdoctoral researchers the chance to develop their skills by means of international mobility. Through the implementation of an original and personalised research project, MSCA Postdoctoral Fellowships aim to foster excellence through training and mobility and to equip researchers with new skills and competences in order to identify solutions to current and future challenges.

University of Rijeka, Croatia/precision engineering research group invites motivated postdoctoral researchers to jointly prepare an application for the [MSCA-PF-2022 call](#) [Marie Skłodowska-Curie Postdoctoral Fellowships](#) call ([MSCA-PF-2022](#)) with them as host organisation.

Description of Hosting organisation/group

Short description (preferably max. 0.5 page) of the host research group/host centre - strengths and scientific achievements and (if applicable) important infrastructure

Link to the webpage of the host group/host center

The Precision Engineering Laboratory (http://precenglab.riteh.uniri.hr/) research group of the Faculty of Engineering (RITEH - http://www.riteh.uniri.hr/en/) and the Centre for Micro- and Nano Sciences and Technologies (NANORI - https://nanori.uniri.hr/) of the University of Rijeka, Croatia (https://uniri.hr/en/home/), has a decades-long expertise in precision engineering and the micro- and nanosystems' technologies. In this frame, the research in the field of nanotribology focuses especially on the experimental characterisation and predictive modelling of the frictional phenomena in the nanometric domain. Our expertise is focused on the tribological characterisation of the surface and adhesive properties of technologically relevant thin-film materials depending on their elemental structure and used synthesis technologies. The experimental part of the research is based on Atomic Force Microscopy (AFM) and nanoindentation measurements in a set of points determined in the multidimensional experimental space via advanced Design-of-Experiments (DoE) methods. This advanced experimental equipment is available at the NANORI laboratory premises, which is also equipped with state-of-the-art experimental infrastructure for various types of spectroscopy analyses (SIMS, XPS), as well as with an Atomic Layer Deposition (ALD) device for synthesis of thin-films. Using the thus attained elaborate quantitative experimental data of nanoscale frictional values, advanced numerical models are then developed to obtain in-depth insights and predictive tools, which are increasingly based on novel machine learning and artificial intelligence paradigms, allowing to attain excellent predictive accuracy, but also to establish functional descriptions of the multidimensional dependence of the nano- and micro-scale friction on the variable parameters influencing it. A synthesis of the scientific achievements in this regard are outlined in https://sciencex.com/news/2021-03-valuable-insights-nanoscale-friction-ai-based.html, https://www.tribonet.org/friction-on-nanoscale-films/, https://www.eletimes.com/new-insights-on-nanoscale-friction-via-an-ai-based-predictive-model.

Your profile including Topics/expertise

Describe here in which research domains/topics you welcome postdoctoral candidates for an MSCA-PF application (preferably max. 0.5 page)

Postdoctoral candidates familiar with research domains of experimental measurement in mechanical engineering and especially precision engineering and physics (thin films, surface characterisation, atomic force microscopy (AFM), Lateral Force Microscopy (LFM), LFM calibration methods, spectroscopy, and microscopy methods, etc.), numerical (multi-scale) modelling and development of machine learning and/or artificial intelligence blackbox and whitebox models, are welcome to apply. Candidates' familiarity with topics of tribology, surface properties, adhesion, wear, thin-film synthesis and characterisation are also welcome. Familiarity with molecular dynamics modelling and multi-scale modelling is a plus.

Preferably you can list one or more potential supervisors and (a short) reference to their expertise

Prof. Saša Zelenika - https://orcid.org/0000-0003-1536-0132

Dr. Marko Perčić - https://orcid.org/0000-0002-5873-0263

- **Expected qualifications/expertise of the candidate:**
  The candidate must be qualified for laboratory work (with a preference for knowledge of experimental methods in nanotechnology), working with laboratory equipment, knowledgeable in using Matlab, Python or similar SW package, experience in the development of machine learning and artificial intelligence methods, applying advanced statistical analyses and metrics for models' predictive performance evaluation, data mining and pre- and post- processing of data.
  - **Please specify the required PhD degrees if applicable:**
    Mechanical Engineering or, alternatively, (solid-state) Physics
- You must have a completed PhD at the time of the call deadline (14 September 2022).
- Candidates must have a maximum of 8 years full-time research experience from the PhD award date until September 14, 2022. Periods of inactivity in research (e.g. unemployment, periods of employment outside research, parental or sick leave) do not count towards the time of research experience.
- For European fellowships, candidates can be of any nationality and must not have resided or carried out their main activity (work, studies, etc.) in Croatia for more than 12 months in the 36 months immediately before September 14, 2022.
- Highly motivated candidate with an excellent research track record appropriate to career stage, as evidenced by academic publications and other scientific output.

What we offer

- Support and guidance for the preparation of your MSCA PF proposal
- A stimulating, interdisciplinary environment for high-level research.

How to apply?

Indicate your interest by contacting the host institution as follows:

Please contact Dr. Marko Perčić (mpercic@riteh.hr) (c.c. szelenika@uniri.hr, tea.dimnjasevic@uniri.hr) by email with a short CV and motivation to indicate your interest to prepare a MSCA-PF application with a supervisor /host group/…

After the supervisor agrees to support you as a MSCA-PF candidate, you can start preparation of MSCA PF project proposal and will be supported further by the Research Support Office of the host university.

For more information please contact the MSCA coordinator of the host institution: Tea Dimnjasevic, tea.dimnjasevic@uniri.hr