



## CTU Global Postdoc Fellowship

### CTU Global Postdoc Fellowship Round II at the Faculty of Electrical Engineering

The Vice-Chancellor of the Czech Technical University in Prague invites applications for the [CTU Global Postdoc Fellowship Program](#), Round II at the Faculty of Electrical Engineering of CTU.

This new and attractive two-year fellowship-program offers excellent researchers who have recently completed their PhD the chance to continue their research career at CTU. Fellows will receive a two-year fellowship and become members of a team led by a mentor.

The fellowship aims primarily at external international scientists who are currently conducting research abroad. Applicants must prove completion of their PhD within the last seven years (i.e., 2015 or later), no later than the start date of their employment contract. The fellowship aims at authors (co-authors) of two or more publications in a journal with IF. The mentor has a strong vote in the selection process.

The CTU Global Postdoc Fellowship is open to topics listed below in this document. Researchers are invited to apply directly to the Faculty of Electrical Engineering. Applicants who successfully passed the Round I interview and were not eligible due to not proving a successful completion of their PhD may also be considered.

**Expected start date:** Spring 2022

**Application deadline:** December 31, 2021

Research topic #3-1

1 Topic	Ab initio investigation of the effect of heavy-ion irradiation on the mechanical properties of nanostructured alloys
2 Link to topic / project page	<a href="https://nano.cvut.cz/jobs-opportunities/ab-initio-investigation-of-the-effect-of-heavy-ion-irradiation-on-the-mechanical-properties-of-nanostructured-alloys">https://nano.cvut.cz/jobs-opportunities/ab-initio-investigation-of-the-effect-of-heavy-ion-irradiation-on-the-mechanical-properties-of-nanostructured-alloys</a>
3 Short description of topic	Ions implantation leads primarily to the formation of vacancy type of defects and self-interstitial atoms (SIAs). With increasing ions fluence, temperature, and time, these point defects migrate and eventually cluster, forming dislocation loops, voids, and stacking faults in metals. When the density of these defects is high, coalescence will occur and some detrimental effects will appear such as swelling, hardening, embrittlement, blisters, and exfoliation, and direct failure. It is well established in a single crystal that strains and stresses can strongly influence the defect growth and impurity migration, and can consequently play a major role in the microstructural transformations of materials under irradiation. A full understanding of these phenomena and reliable prediction of a material lifetime is required in multilayer systems. The successful candidate is expected to perform ab initio simulations to reveal the effect of radiation damage on the mechanical properties of metallic multilayers such as created strain, elastic properties, Vicker’s hardness, and fracture toughness.
4 Description of ideal candidate	Successful candidates must have a PhD in Physics, Chemistry, Materials Science, or closely related disciplines. Experience with magnetron sputtering and thin film characterization (structure, mechanical properties) is mandatory. Previous experience in the HiPIMS process, theoretical or experimental, is welcome. Good knowledge of English, both written and oral, is compulsory.

Mentor

Huseyin Sener Sen	Faculty of Electrical Engineering	Department of Control Engineering	<a href="mailto:senhusey@fel.cvut.cz">senhusey@fel.cvut.cz</a>
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Salary: CZK 62 200 per month

Research topic #3-3

1 Topic	Adaptive Force Matching for Materials Science
2 Link to topic / project page	<a href="https://nano.cvut.cz/jobs-opportunities/adaptive-force-matching-for-materials-science">https://nano.cvut.cz/jobs-opportunities/adaptive-force-matching-for-materials-science</a>
3 Short description of topic	The Adaptive Force Matching scheme will be implemented and used in order to refine and/or parameterize ex-novo interaction potentials for materials relevant to tribological applications. The method consists of alternating classical and ab initio simulations in order to explore relevant regions of the phase space, and produce a training set of configurations and forces, respectively. Particular focus will be put to reactive force fields, i.e. able to describe breaking/formation of chemical bonds. The generated force fields will then be extensively tested in order to assess their performance in terms of ability to predict structural, elastic and dynamical target properties
4 Description of ideal candidate	Successful candidates must have a PhD in Physics, Chemistry, Materials Science or closely related disciplines. Experience with classical molecular dynamics simulations or electronic structure calculations is mandatory. Previous experience on the development of classical force fields and/or with the QM/MM method represents a plus. Researchers are expected to perform calculations on Linux-based HPC centers. Good knowledge of English, both written and oral, is compulsory

Mentor

Alessandro, Di Pierro	Faculty of Electrical Engineering	Department of Control Engineering	<a href="mailto:dipieale@fel.cvut.cz">dipieale@fel.cvut.cz</a>
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Salary: CZK 62 200 per month

## Research topic #3-6

1 Topic	Multiple MIMO optical camera communication based sensor network
2 Link to topic / project page	<a href="https://elmag.fel.cvut.cz/en/research-groups/optics/">https://elmag.fel.cvut.cz/en/research-groups/optics/</a> under cooperation with partners from European project COST Action CA19111 NEWFOCUS <a href="https://www.newfocus-cost.eu/action/">https://www.newfocus-cost.eu/action/</a>
3 Short description of topic	<p>Optical camera communication (OCC) can be considered a convenient and versatile communication technology within the framework of optical wireless communications. OCC is a pragmatic version of Visible Light Communication (VLC, LiFi) based on a smart device camera that allows easier implementation of various services in smart devices. OCC can be a more favourable solution in indoor environments and for outdoor. Camera allows to detect signal from multiple transmitters at once allowing multiple input multiple output (MIMO) communication. The main task will be to develop multiple MIMO OCC technology with using multiple MIMO channels in terms number of transmitters and cameras for indoor and outdoor sensor networks with focus on mitigation of propagation/channel impairments, atmospheric influences, advanced image processing techniques and implementation using mobiles and industrial cameras</p>
4 Description of ideal candidate	<p>Candidate should - Research within visible light communications, processing images from cameras, research in OCC is advantage - have more than 5 impact journal papers as a main author, - h-index equal or higher than 5, - early stage researcher with maximum 3 years after the defense of PhD (expected to have PhD with start of the postdoc) - have PhD from different institution than MSc</p>

## Mentor

Stanislav Zvánovec	Faculty of Electrical Engineering	Department of Electromagnetic Field	<a href="mailto:xzvanove@fel.cvut.cz">xzvanove@fel.cvut.cz</a>
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Salary: CZK 70 000 per month



## CTU Global Postdoc Fellowship

### Applications process

To apply for the CTU Global Postdoc Fellowship you need to provide the following documents in English electronically to Ing. Kateřina Dřimalová, [drimakat@fel.cvut.cz](mailto:drimakat@fel.cvut.cz) with the **topic title** as the **subject of the email**:

- CV, including list of publications (max. 4 pages). At least two IF<sup>1</sup> journal publications are expected. Papers accepted for publication yet waiting to be printed do count if a proof of acceptance is provided.
- Motivation letter (max. 2 pages).
- PhD certificate (copy).
- You may attach other documents supporting your application such as recommendation letters etc.

Applicants are advised to contact mentors for more details.

### Selection process

The applications will be assessed by a committee based on the sent documents and an (online) interview with prospective candidates, which will take place preferably in the first half on January 2022. The mentor has a strong vote in the selection process.

The final decision of the committee will be communicated to applicants by January 31, 2022.

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<sup>1</sup> Impact Factor according to the Web of Science [Journal Citation Reports](#)



## CTU Global Postdoc Fellowship

### Application for CTU Global Postdoc Fellowship

1. Applicant

Name(s)	Surname	e-mail	Mailing address
Date and place of birth	Country(ies) of citizenship	Skype or similar contact(s) for interview	

2. Topic (selected from the list)

Research topic #	Topic

3. List of accompanying documents:

- a. CV including list of publications (mandatory)
- b. PhD certificate (copy) (mandatory)
- c. Motivation letter
- d. ....

4. I apply for the CTU Global Postdoc Fellowship.

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Date, signature