



ČESKÉ VYSOKÉ UČENÍ TECHNICKÉ V PRAZE

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Fakulta Elektrotechnická  
Katedra Řídicí Techniky

**Postdoctoral position in  
“Ab initio investigation of the effect of heavy-ion irradiation on  
the mechanical properties of nanostructured alloys”  
Prague, Czech Republic**

**Job description**

Applications are invited for postdoctoral researchers in the [Advanced Materials Group](#) (AMG) at the [Department of Control Engineering, Faculty of Electrical Engineering, Czech Technical University in Prague](#), to work on the [ab initio investigation of the effect of heavy-ion irradiation on the mechanical properties of nanostructured alloys](#), under the supervision of Dr. Sener Hüseyin. AMG is a well-established group and consists of dynamic and motivated researchers leading international collaborations on broad interdisciplinary topics.

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.

**Job requirements**

Successful candidates must have a PhD in Physics, Chemistry, Materials Science or a closely related discipline obtained in the year 2015 or later. A strong background in solid-state density functional theory is mandatory. Experience in using large-scaling DFT methods represents a great advantage. Researchers are expected to perform calculations on Linux-based HPC architectures, as well as writing and submitting proposals to obtain access to HPC resources. Programming experience in widely-used scientific languages (Fortran, C, C++) together with knowledge of shell scripting in a UNIX environment is also desirable. Good knowledge of English, both written and oral, is compulsory.

**Contract details**

The positions will be available for up to two years upon successful completion of a probationary first year. The salary will be very competitive at 62200 CZK (~ 2400 EUR) gross per month.

**How to apply**

The call is open immediately and applications are received until 31.8.2021. Decision on the application will be taken by the end of September 2021. The expected starting date is 1.1.2022. Your application must include: letter of motivation, CV, list of publications, reference contacts and proof of completed PhD. Please direct all correspondence to [advamat@fel.cvut.cz](mailto:advamat@fel.cvut.cz) and to [drimkat@fel.cvut.cz](mailto:drimkat@fel.cvut.cz)