

Opis delovnega mesta mladega raziskovalca/ke (*Description of the Young Researcher's position*)

1. Članica UL (*UL member*):

Univerza v Ljubljani, Fakulteta za elektrotehniko
(*University of Ljubljana, Faculty of Electrical Engineering*)

2. Ime, priimek in elektronski naslov mentorja/ice (*Mentor's name, surname and email*):

Marko Jošt (marko.jost@fe.uni-lj.si)

3. Raziskovalno področje (*Research field*):

2.03.03 – Obnovljivi viri in tehnologije

4. Opis delovnega mesta mladega raziskovalca/ke (*Description of the Young Researcher's position*):

Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo:

Raziskovalno delo mladega raziskovalca bo umeščeno v širše področje fotovoltaike, ki tako v Evropi kot tudi v Sloveniji v preteklih letih beleži strm razvoj. Osredotočeno bo na izdelavo in karakterizacijo perovskitnih sončnih celic, nove fotovoltaične tehnologije, ki obeta, da bo v kratkem konkurenčna tehnolgiji silicijevih sončnih celic in da bo kmalu vstopila na trg.

Potek raziskovalnega dela se bo izvajal v več medsebojno povezanih fazah. Prva faza bo usmerjena v izdelavo visokoučinkovitih perovskitnih sončnih celic z različnimi kompozicijami in energijskimi režami. V drugi fazi bodo izdelane sončne celice podvržene naprednim karakterizacijskim testom stabilnosti pod različnimi pogoji delovanja, na podlagi katerih se bo določila ustreznost različnih perovskitnih sončnih celic za dolgoročno stabilno delovanje. Tretja faza bo osredotočena na poglobljeno analizo pridobljenih podatkov ter njihovo vključitev v modele energijskega izplena in pospešenega testiranja, za kar bodo uporabljene napredne simulacijske tehnike in tehnike strojnega učenja oziroma umetne inteligence. Rezultati raziskav bodo služili za optimizacijo obstoječih ter razvoj novih konceptov perovskitnih sončnih celic, kar bo vodilo v podaljšanje stabilnosti in razumevanje degradacije perovskitnih sončnih celic ter s tem v povečanje energijskega izplena tekom celotne življenjske dobe.

Mladi raziskovalec bo svoje delo opravljal v okviru Laboratorija za fotovoltaiko in optoelektroniko (LPVO) na Fakulteti za elektrotehniko Univerze v Ljubljani (UL FE). Njegovo raziskovalno delo bo tesno vpeto tako v raziskovalni program »Fotovoltaika in elektronika« (P2-0415) kot tudi v ostale tekoče mednarodne raziskovalne projekte, v sklopu katerih bo sodeloval z drugimi priznanimi raziskovalnimi organizacijami doma in v tujini.

Mladi raziskovalec bo vpisal doktorski študij Elektrotehnika na UL FE. Od kandidata se pričakuje visoka stopnja motiviranosti za delo, veselje do eksperimentalnega dela v laboratoriju,

suverenost v programiranju ter da obvlada angleški jezik.

eng:

The research activities of the young researcher will be focused on the area of photovoltaics, which has grown rapidly in the recent years both in Europe as well as in Slovenia. The specific tasks will involve fabrication and characterization of perovskite solar cells that have the potential to compete with silicon solar cell technology and to enter the PV market soon.

The research will be conducted in multiple interconnected phases. The first phase will focus on fabrication of highly efficient perovskite solar cells with different compositions and bandgaps. In the second phase, the fabricated solar cells will be subjected to advanced stability characterization tests under various operating conditions, based on which the suitability of various perovskite solar cells for long-term stable operation will be determined. The third phase will focus on the in-depth analysis of the obtained data and their inclusion in models of energy yield and accelerated testing, for which advanced simulation techniques and techniques of machine learning or artificial intelligence will be used. The results of the research will enable optimization of existing and the development of new concepts of perovskite solar cells, which will lead to improving of stability and understanding of degradation of perovskite solar cells, and thus to the increase of the energy yield during the entire lifetime.

The young researcher will carry out his research in the Laboratory of Photovoltaics and Optoelectronics (LPVO) at the Faculty of Electrical Engineering, University of Ljubljana (UL FE). His research activities will be tightly connected to the research programme »Photovoltaics and Electronics« (P2-0415) and other on-going international research projects, which will lead to cooperation with other renowned domestic and foreign research institutions.

The candidate will enroll to the doctoral program Electrical Engineering at UL FE. He is expected to exhibit a high level of motivation, joy for experimental work in the laboratory, be well versed in computer programming, and is an advanced user of the English language.