



HR EXCELLENCE IN RESEARCH



THE ADAM MICKIEWICZ UNIVERSITY, POZNAN

ANNOUNCES

A COMPETITION

for the position of Postdoctoral Researcher

at the NanoBioMedical Centre

Basic information

- 1. Competition reference number:**
- 2. Research discipline (research field):**
Physics, Material Science and Engineering
- 3. Number of work hours per week including a task-based work schedule (if applicable):**
Full-time, 40 hours per week in a task-based work time system.
- 4. Type of an employment contract and expected duration of employment, i.e.: permanent/temporary/fixed-term contract for year/...years**
Fixed-term contract for 12 months - 1 year (An extension for an additional 12 months is considered according to performance)
- 5. Anticipated job starting date:**
01-11-2023
- 6. Workplace location:**
NanoBioMedical Centre, Wszechnicy Piastowskie 3, 61-614 Poznan.
- 7. Application deadline and process:**
Electronic submission to igoyat@amu.edu.pl Application deadline: 03.10.2023. Please note that the job reference number should be quoted in the application.

8. Required documents

- Application form/letter of the candidate addressed to the Vice-Rector announcing the competition;
- *Curriculum Vitae*;
- Diplomas or certificates issued by colleges and universities attesting to education and degrees or titles held (in case of academic degrees obtained abroad - the documents must meet the equivalence criteria set out in Article 328 of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2023, item 742 Polish: Dziennik Ustaw 2023 poz.742 t.j.);
- Information on the Applicant's research, teaching and organizational achievements,
- Other documents as determined by the competition committee.
- Consent to the processing of personal data as follows : *In accordance with Article 6 (1) (a) of the General Data Protection Regulation of 27 April 2016. (OJ EU L 119/1 of 4 May 2016) I consent to the processing of personal data other than: first name, (first names) and surname; parents' first names; date of birth; place of residence (mailing address); education; previous employment history, included in my job offer for the purpose of the current recruitment."*

Conditions of the competition determined by the competition committee

I) Determination of qualifications: (researcher profile) according to the Euraxess guidelines

X (R2) Recognised Researcher (PhD holders or equivalent who are not yet fully independent)

<https://euraxess.ec.europa.eu/europe/career-development/training-researchers/research-profiles-descriptors>

II) Job Offer description

The job offer refers to the position in the NCN SONATA BIS project (National Science Center) entitled Nanocomposites based on 1D semiconductors modified by MXene and ALD for efficient photoelectrochemical water splitting (Contract number: UMO-2020/38/E/ST5/000176).

Hydrogen (H₂) production via solar water splitting is one of the most ideal strategies for providing sustainable fuel because this requires only water and sunlight. In achieving high-yield production of H₂ as a recyclable energy carrier, the nanoscale design of novel nanocomposites plays a pivotal role in photoelectrochemical (PEC) water splitting reactions. In this context, the arrival of one-dimensional (1D) semiconductor nanocomposites modified by 2D materials (e.g. graphene, black phosphorous, Transition metal dichalcogenide - TMD, MXene etc.) with remarkable electronic and optical characteristics have attracted great attention for their application to PEC systems. The development of these nanocomposites can significantly enhance the PEC efficiencies via bandgap alteration, heterojunction formation and other effects.

The proposed project is a multidisciplinary proposal, based on different research areas related to the application of 1D semiconductor nanostructures modified by MXene and Atomic Layer Deposition (ALD) for solar water splitting. The project is devoted to the tailoring, understanding and application of the nanocomposites for PEC water splitting, via the control of their electrical/optical properties and the understanding of the changes induced by MXene and MXene/Metal oxide coatings on 1D semiconductor surfaces.

The main goal of the project is the development and investigation of novel nanocomposites based on 1D semiconductor materials (Si nanowires – SiNW, ZnO nanorods – ZnO-NR, and TiO₂ nanorods – TiO₂-NR) functionalized/modified by MXene (e.g. Ti₃C₂) and ALD metal oxides - MO_x (TiO₂, ZnO) layer for solar water splitting. The developed nanocomposites (SiNW/MXene/MO_x; ZnO-NR/MXene/MO_x and TiO₂-NR/MXene/MO_x) are expected to demonstrate new fundamental properties (high surface area,

enhanced charge carrier separation, stability, increased absorption) which will enhance the PEC efficiency of fabricated photoelectrodes.

III) Requirements and qualifications

The competition is open to individuals who meet the requirements specified in Article 113 of the Law on Higher Education and Science of 20 July 2018 (Journal of Laws of 2023, item 742, Article 113 as amended) and who meet the following requirements:

1. PhD in physical sciences or materials engineering.
2. They fulfilled formal requirements regarding the date of obtaining the doctoral degree in accordance with the regulations of the National Science Center https://www.ncn.gov.pl/sites/default/files/pliki/uchwaly-rady/2021/uchwala81_2021-zal1.pdf . Persons who do not have a doctoral degree may apply, provided they plan their defence no later than 15 August 2022.
3. Proven record of productivity and publications in indexed journals.
4. Experience in thin films, and Nanotechnology.
5. Experience in some of the following techniques: SEM/TEM, AFM, and lithography.

IV) Required languages

1. **Language:** English - good
2. **Language:** Polish - fluent

V) Required research, teaching or mixed experience

- Proven experience in experimental techniques (SEM, AFM etc.).
- Experience with semiconductor materials or thin films.
- Independence, good organization of work, ability to work in a team.
- Experience in writing scientific publications and conference presentations.
- Excellent knowledge of relevant software such as: OriginLab, Labview, CorelDraw.
- Knowledge of nanofabrication and photoelectrochemistry will be an additional advantage.

VI) Benefits

- ✓ financial bonuses for high-impact publications
- ✓ an atmosphere of respect and cooperation
- ✓ supporting employees with disabilities
- ✓ flexible working hours
- ✓ co-financing of language learning courses
- ✓ co-financing of training and courses
- ✓ additional days off for education
- ✓ life insurance
- ✓ pension plan
- ✓ savings and investment fund
- ✓ preferential loans
- ✓ additional social benefits
- ✓ leisure-time funding
- ✓ subsidizing children's vacations
- ✓ "13th" salary

VII) Eligibility criteria

1. Matching the candidate's scientific profile with the advertisement.
2. Number and scientific level of the candidate's scientific publications.
3. Number, scientific level, and of the candidate's scientific conference presentations.
4. Grade on the diploma.
5. Internships and participation in research projects.

VIII) The selection process

1. Competition committee begins working no later than 14 days after the deadline for submission of documents.
2. Formal evaluation of submitted proposals.
3. Call to provide additional or missing documents if necessary.
4. Selection of candidates for the interview stage.
5. Interviews for candidates who meet the formal requirements.
6. The committee has the right to request external reviews of candidates' work or to ask candidates to conduct teaching assignments with an opportunity for student evaluation.
7. The chair of the competition committee announces the results and informs the candidates. This information will include justification with a reference to candidates' strengths and weaknesses. Submitted documents will be sent back to candidates.

IX) Prospects for professional development

- supervision in building a scientific profile through the publication in high-impact scientific journals,
- assistance in writing grant applications in domestic (FNP, NCN) and foreign (MSCA) research projects,
- establishing cooperation with renowned research centers in the world.

RODO Information Clause :

Pursuant to Article 13 of the General Data Protection Regulation of 27 April 2016. (Official Journal of the EU L 119 of 04.05.2016) we inform that:

1. The controller of your personal data is Adam Mickiewicz University, Poznań with the official seat: ul. Henryka Wieniawskiego 1, 61 - 712 Poznań.
2. The personal data controller has appointed a Data Protection Officer overseeing the correctness of the processing of personal data, who can be contacted via e-mail: iod@amu.edu.pl.
3. The purpose of processing your personal data is to carry out the recruitment process for the indicated job position.
4. The legal basis for the processing of your personal data is Article 6(1)(a) of the General Data Protection Regulation of 27 April 2016 and the Labour Code of 26 June 1974. (Journal of Laws of 1998 N21, item 94 as amended).
5. Your personal data will be stored for a period of 6 months from the end of the recruitment process.
6. Your personal data will not be made available to other entities, with the exception of entities authorized by law. Access to your data will be given to persons authorized by the Controller to process them in the performance of their duties.
7. You have the right to access your data and, subject to the law, the right to rectification, erasure, restriction of processing, the right to data portability, the right to object to processing, the right to withdraw consent at any time.
8. You have the right to lodge a complaint to the supervisory authority - the Chairman of the Office for Personal Data Protection, ul.Stawki 2, 00 - 193 Warsaw.
9. Providing personal data is mandatory under the law, otherwise it is voluntary.
10. Your personal data will not be processed by automated means and will not be subject to profiling.