

## COMPETITION ANNOUNCEMENT

The Dean of the Faculty of Physics, with the consent of the Rector of the University of Warsaw, announces a competition for the position of Assistant Professor<sup>1</sup> in the project NCN SONATA 20 "Lasing of nanoporous anodic alumina organic-fluorophore-infiltrated enabling an early-stage detection of neurodegenerative diseases".

### About the project:

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| <b>Title of project</b>       | <b>Lasing of nanoporous anodic alumina organic-fluorophore-infiltrated enabling an early-stage detection of neurodegenerative diseases</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Type of project</b>        | <b>SONATA 20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Funding institution</b>    | National Science Centre of Poland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Duration of project</b>    | 36 months                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Head of project</b>        | dr inż. Grzegorz Szwachta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description of project</b> | The project primarily focuses on the design and fabrication of an advanced oxide-based platform for the detection of aggregates (oligomers) using lasing spectroscopy. The aggregates associated with the early stages of Parkinson's and Alzheimer's diseases exhibit a range of nanoscale dimensions and occur at very low concentrations in physiological fluids. As an alternative to thin biosensing layers, droplet resonators, and liquids confined within resonant cavities, the proposed approach employs nanoporous anodic alumina platforms. The platforms will be surface-functionalised to enable the efficient capture and immobilisation of labelled aggregates within the nanopores. The pore diameter of the platform will be periodically varied, enabling the formation of internal light-scattering centres to provide additional enhancement of the laser signal. The proposed research will integrate nanotechnology, photonics, and surface chemistry. |

### Position details:

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| <b>Position title</b>                                                                         | <b>Assistant Professor</b>                                                  |
| <b>Organisational unit</b>                                                                    | Faculty of Physics                                                          |
| <b>Employment group</b>                                                                       | <b>Research (no teaching duties involved)</b>                               |
| <b>Position profile<sup>2</sup></b>                                                           | R2, researcher holding a PhD degree, building their scientific independence |
| <b>Academic discipline<sup>3</sup></b>                                                        | Physical sciences                                                           |
| <b>Number of positions</b>                                                                    | 1                                                                           |
| <b>Form of employment and length of working time (proportionally to full-time employment)</b> | Employment contract, full-time employment                                   |

<sup>1</sup> The nouns used in the announcement apply to people of all genders.

<sup>2</sup> Complete only in the case of competition for the position in the research employment group or the research and teaching employment group.

<sup>3</sup> Complete only in the case of competition for the position in the research employment group or the research and teaching employment group.

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| Expected date of commencement of work and employment period | 18 months, starting from 01.02.2027 or later.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Remuneration                                                | Basic remuneration 140 000 PLN gross gross/year (including the employer's costs, additional annual remuneration, allowance for years of service, etc.).<br>More information: <a href="#">link</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Other working conditions                                    | Workplace: Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland<br><br>The postdoctoral researcher will have the opportunity to conduct independent experimental research in the areas of nanofabrication, surface functionalisation, and the optical properties of nanostructures and photonic crystals based on anodic aluminium oxide. Participation in the project will facilitate the development of expertise in anodisation, spectrophotometry, fluorimetry, and surface functionalisation using aminosilanes. The postdoctoral researcher will have access to advanced research infrastructure at the University of Warsaw and will have the opportunity to collaborate with specialists in optics, photonics, advanced laser techniques, and surface chemistry. The project will also support the development of skills in independent research planning, data analysis, preparation of scientific publications, coordination of experimental activities, and supervision of junior researchers. The researcher is expected to participate in international scientific conferences and to develop scientific collaborations and new research directions at the interface of nanotechnology, photonics, and surface chemistry.<br><br>More information: <a href="#">link</a> |
| <b>Basic responsibilities and obligations</b>               | <ul style="list-style-type: none"> <li>– conducting technological work related to the anodisation of aluminium surfaces, as well as preparing and optimising the geometrical dimensions of the resulting nanopores;</li> <li>– functionalisation of anodic aluminium oxide surfaces using aminosilanes and related compounds, optimisation of functionalisation processes, and analysis of the obtained results;</li> <li>– optical characterisation of nanostructures and photonic crystals based on anodic alumina;</li> <li>– ensuring the continuity of technological work and providing periodic support to students involved in the project, particularly in the fabrication of nanostructures and photonic crystals;</li> <li>– close collaboration with the project leader, co-investigators, and other members of the research team in integrating technological processes with the characterisation of nanostructures and photonic crystals based on anodic aluminium oxide;</li> <li>– preparation of research reports, scientific publications, and conference presentations.</li> </ul> <p>More information: <a href="#">Scope of responsibilities of the academic teacher</a></p>                                                                                                             |
| <b>Conditions for entering the competition<sup>4</sup></b>  | The employment will take place in accordance with the NCN regulations and requirements set out in Article 113 of the Law on Higher Education and Science (Journal of Laws of 2024, item 1571). In particular, the person employed for this position must have a doctoral degree obtained no earlier than 12 years before the year of employment in the project. This period does not include breaks related to maternity leave, additional maternity leave, leave on the conditions of maternity leave, additional leave on the conditions of maternity leave, paternity leave, or parental leave granted on the terms specified in the provisions of the Labor Code or the receipt of sickness allowance or rehabilitation benefits in connection with incapacity for work, including those caused by diseases requiring medical rehabilitation. For women, the indicated 7-year period may be extended by 18 months for each child born or adopted. A woman can choose a more favourable way to indicate breaks in her scientific career.                                                                                                                                                                                                                                                                 |

<sup>4</sup> Required by the Act, the Law on Higher Education and Science, the Statute of the University of Warsaw, as well as necessary for the position.

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|                                                                   | <p>The employment will take place in accordance with the NCN regulations, in particular the employed person must meet the following conditions jointly:</p> <ul style="list-style-type: none"> <li>– the principal investigator was not a supervisor or assistant supervisor of their doctoral dissertation;</li> <li>– their PhD degree has been awarded by another institution than the one planned to employ them at this post or they have completed a continuous and evidenced post-doctoral fellowship of at least 10 months in another institution than the host institution for the project and in another country than the one in which they have been conferred a PhD degree;</li> <li>– at the time of receiving remuneration, they will not be receiving any other remuneration paid from the funds granted to research projects under NCN calls under the heading of direct costs;</li> <li>– in the period of receiving the remuneration they will be receiving no remuneration from another employer pursuant to an employment contract, including an employer with registered office outside of Poland;</li> <li>– during the period of receiving this remuneration, he will not receive retirement benefits from the social security system;</li> <li>– will be employed for at least 6 months.</li> </ul> <p>The candidate should have:</p> <ul style="list-style-type: none"> <li>– Fulfilment of the requirements set out in Article 113 of the Law on Higher Education and Science (Journal of Laws of 2024, item 1571, consolidated text)</li> <li>– significant scientific track record, including publications and conference presentations;</li> <li>– international research experience, including research internships, fellowships, and/or scientific collaborations;</li> <li>– practical experience in the anodisation of metal surfaces (e.g. aluminium, titanium, etc.) and/or in the functionalisation of metal surfaces using aminosilanes;</li> <li>– experience in material characterisation using UV–Vis spectrophotometry and/or fluorimetry;</li> <li>– ability to independently plan and conduct multi-stage experimental research involving the fabrication and characterisation of nanostructures and/or photonic crystals;</li> <li>– good command of English, both spoken and written, including the ability to prepare scientific publications.</li> </ul> |
| In addition, we expect <sup>5</sup>                               | <ul style="list-style-type: none"> <li>– experience working with a glovebox;</li> <li>– experience working with fluorescent dyes;</li> <li>– proficiency in Python programming;</li> <li>– experience in supervising PhD students and/or undergraduate students.</li> </ul> <p>If hired, we expect the University of Warsaw to be the primary workplace for the successful candidate.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Criteria for the assessment of candidates in a competition</b> | <p><b>1. Scientific track record (publications, projects, and presentations)</b></p> <ul style="list-style-type: none"> <li>– Number and quality of scientific publications, including publications in journals indexed in the Journal Citation Reports (JCR);</li> <li>– Participation in national and international research projects;</li> <li>– Presentations at scientific conferences.</li> </ul> <p><b>2. Research experience and competencies</b></p> <ul style="list-style-type: none"> <li>– Relevance of the candidate's research experience to the subject matter of the project;</li> <li>– Knowledge of tools, methods, and techniques relevant to the anodisation of metal surfaces, surface functionalisation, and the optical characterisation of nanostructures and photonic crystals;</li> <li>– Experience in the structural and optical characterisation of nanostructures and photonic crystals based on anodic alumina.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

<sup>5</sup> Additional conditions to be met; however, not meeting them will not lead to a negative formal assessment.

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|  | <b>3. Interpersonal and organisational skills</b> <ul style="list-style-type: none"> <li>– Communication skills and ability to work effectively as part of a research team;</li> <li>– Ability to independently plan and conduct research.</li> </ul> |
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Position-related/not related<sup>6</sup> to activities covered by the protection of minors.

#### Competition rules:

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| <b>Announcement reference number</b>                    | <b>WF-1210-20/2026</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Keywords</b>                                         | nanophotonics, nanofabrication, anodisation, aluminium oxide, spectrophotometry, fluorimetry, surface functionalisation, fluorescent dyes, oxide-based platforms                                                                                                                                                                                                                                                                                                                               |
| <b>Deadline for submitting applications<sup>7</sup></b> | <b>30.11.2026</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Method of submitting an application</b>              | <b>Applications should be sent to the email address: <a href="mailto:grzegorz.szwachta@fuw.edu.pl">grzegorz.szwachta@fuw.edu.pl</a></b>                                                                                                                                                                                                                                                                                                                                                        |
| <b>Required documents</b>                               | <ul style="list-style-type: none"> <li>– Candidate's questionnaire <a href="#">link</a></li> <li>– Copy of the diploma confirming the required degree;</li> <li>– If applicable, information on the expected date of obtaining the PhD degree (the PhD degree must be obtained before submitting the documents required for employment);</li> <li>– Cover letter in English;</li> </ul> <p><b>Please ensure that your application is complete and submitted by the deadline indicated.</b></p> |

The competition is the first stage of the recruitment process, please read the Policy of Open, Transparent and Merit-Based Recruitment at the University of Warsaw [link](#)

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| <b>Stages of competition</b>                                                   | <p>The competition consists of the following stages:</p> <ul style="list-style-type: none"> <li>– Stage I - formal evaluation of documents,</li> <li>– Stage II - substantive evaluation on the basis of submitted documents,</li> <li>– Stage III - interview with selected candidates,</li> <li>– Stage IV - final evaluation of competence, experience and scientific achievements,</li> <li>– Stage V - adjudication of the competition and announcement of results.</li> </ul> |
| <b>Anticipated date and method of notification of the competition outcomes</b> | Candidates will be informed individually of the results of the selection process by email by 21 December 2026.                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Contact for any questions relating to the competition</b>                   | <p>By email to: <a href="mailto:grzegorz.szwachta@fuw.edu.pl">grzegorz.szwachta@fuw.edu.pl</a>, quoting the reference number of the announcement.</p> <p>Accessibility needs should be indicated on the Candidate's Questionnaire, in: Other relevant information from a candidate</p>                                                                                                                                                                                              |

<sup>6</sup> Delete as appropriate.

<sup>7</sup> Not sooner than 30 days from the date of publication of the announcement.

**Employing faculty/unit:**

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| Research profile of faculty /unit | <a href="https://www.fuw.edu.pl/">https://www.fuw.edu.pl/</a>                                                                                         |
| Teaching profile of faculty/unit  | <a href="https://www.fuw.edu.pl/informacje-ogolne.html">https://www.fuw.edu.pl/informacje-ogolne.html</a>                                             |
| Other information                 | Principal Investigator's website: <a href="https://optics.fuw.edu.pl/ludzie/szwachta-grzegorz">https://optics.fuw.edu.pl/ludzie/szwachta-grzegorz</a> |

The University of Warsaw has implemented the procedure for whistleblowers reporting cases of law violation and for undertaking follow-up actions. For **more information** about this topic and the processing of candidates' personal data please follow the [link](#)

The University of Warsaw is a winner of the HR Excellence in Research award granted by the European Commission to institutions adhering to the European Charter for Researchers.

