**Job Description: Postdoctoral Research Associate**

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| **Faculty:** | ***Faculty of Science & Engineering*** |
| **Department/Subject:** | ***Centre for Integrative Semiconductor Materials (CISM)*** |
| **Salary:** | *Grade 8 (£39,335 - £45,413) per annum* |
| **Hours of work:** | ***Full time 35hours per week*** |
| **Number of positions:** | ***1*** |
| **Contract:** | **This is a fixed term position to 31st December 2027** |
| **Location:** | **This position will be based at the Bay Campus** |

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| **Main Purpose of Post** | The Department of Physics at Swansea University is seeking to appoint a Postdoctoral Research Associate (PDRA) in Semiconductor Physics and Terahertz Science and Technology. The successful candidate will join a thriving research effort in semiconductor science at Swansea University’s new Centre for Integrative Semiconductor Materials (CISM) and will contribute significantly to the EPSRC programme grant "Terahertz frequency devices and systems for ultrahigh capacity wireless communications (TERACOM)" (teracom.uk), EP/W028921/1. This is a collaborative project involving the Universities of Swansea, Leeds, and University College London.  The successful candidate will join a team of researchers aiming to realise next-generation communication systems operating in the terahertz range and participate in inter-site collaborations as well as regular meetings of the consortium that provide networking opportunities. As a research-focused University embedded in the South Wales Compound Semiconductor Cluster, Swansea provides excellent opportunities for applied research, semiconductor technology development, and industrial collaborations.  As the selected PDRA, you will be simulating, designing and developing terahertz devices that rely on novel physical phenomena to achieve unprecedented performance in terahertz modulation and detection. You will be fabricating the samples (field-effect transistor type terahertz devices with a focus on the gallium nitride material system) in the CISM cleanroom. You will be characterising the new devices on existing setups as well as expanding and building new experimental systems for their measurements with terahertz sources. You will present the results on regular project meetings, write up the research outcomes and publish them in international peer-reviewed journals.  More specifically, the responsibilities of the PDRA include:   1. Simulation of terahertz antennas and metamaterials using numerical finite-element analysis software. 2. Design of terahertz devices, systems, and experimental apparatus to carry out measurements in the terahertz range. 3. Fabrication of semiconductor devices in the CISM cleanroom. 4. Characterisation of terahertz modulators using terahertz time-domain spectroscopy. 5. Cryogenic measurements of terahertz detectors using quantum cascade lasers as terahertz sources. |
|  | 1. Pro-actively contribute to and conduct research, including gather, prepare, analyse and interpret data and present results, exhibiting a degree of independence in terms of specifying the focus and direction of that research. 2. Prepare reports, draft patents and papers describing the results of the research, both confidential and for publication. The appointee is expected to be actively engaged in the writing and publishing of research papers, particularly those intended for publication in refereed (e.g. international) journals or comparable as a normal part of their role. 3. Contribute to the supervision and training of undergraduate and postgraduate students. 4. Be self-motivated, creative, and leverage previous experience and knowledge, even if not related to the research area of this post, to come up with new ideas and explore interdisciplinary approaches to problem solving. 5. Taking responsibility for the operation of relevant lab equipment, i.e. supporting its up-keep and maintenance 6. Maintain and enhance scientific collaborations by interacting positively and professionally with partners within the faculty, elsewhere in the University and beyond both in industry/commerce and academia. 7. Contribute to the development of external funding applications to support their own work, that of others and the Faculty and the Institution in general, by writing or contributing to writing such applications. 8. Contribute to Faculty organisational matters to support its operations and to help raise its external research profile. 9. Stay up to date with developments in the field and the wider subject area. 10. Demonstrate own professional development including soft skills, with reference to Vitae Researcher Development Framework. 11. Observe best-practice protocols in maintenance and retention of research records as indicated by HEI and Research Councils records management guidance, upholding high research integrity standards.  This includes ensuring project log-book records, research data and software are deposited with the University/Principal Investigator on completion of the work. 12. Contribute to the Department’s efforts in making research known and accessible to the wider public, e.g., by participation and preparation of Science Festivals and Open Days of the University and press releases about the research outputs. |
| **General Duties** | 1. To promote equality and diversity in working practices and maintain positive working relationships. 2. To conduct the job role and all activities in accordance with safety, health and sustainability policies and management systems, to reduce risks and impacts arising from the work activity. 3. To ensure that risk management is an integral part of any decision-making process, by ensuring compliance with the University’s Risk Management Policy. 4. Any other duties as agreed by the Faculty / Directorate / Service Area. |
| **Person Specification** | **Essential criteria:**   1. A PhD in Physics or Electronic Engineering, 2. A track record of high performance in past education, evidenced by grades in academic transcripts and certificates 3. Evidence of active engagement, personal role, and contribution to developing and carrying out research, writing and publishing research papers, particularly for refereed journals. 4. Excellent interpersonal and communication skills in English. 5. Excellent organisational skills to meet deadlines and bring projects to a timely completion.   **Desirable Criteria**   1. Semiconductor fabrication experience in a cleanroom environment 2. Knowledge of radio-frequency measurements and design of radio-frequency circuits and printed circuit boards 3. Experience in electrical measurements and characterisation of terahertz detectors 4. Expertise in semiconductor device physics and electronics, relevant theory and numerical modelling 5. Ability to demonstrate independence in the research – determining ’what, why, when and with whom' to progress work. 6. Ability to supervise and mentor research students |
| **Welsh Language Level** | Level 1 – ‘a little’ - pronounce Welsh words. Able to answer the phone in Welsh (good morning / afternoon). Able to use very basic every-day words and phrases (thank you, please etc.). Level 1 can be reached by completing a one-hour training course.  For more information about the Welsh Language Levels please refer to the Welsh Language Skills Assessment web page, which is available [here](https://www.swansea.ac.uk/welsh-language-standards/compliance/recruitment/). |
| **Additional Information** | Informal enquiries: Professor David Ritchie ([d.a.ritchie@swansea.ac.uk](mailto:d.a.ritchie@swansea.ac.uk)) / Dr Wladislaw Michailow ([wm297@cam.ac.uk](mailto:wm297@cam.ac.uk)) |

  