



Candidate Information

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| Position: | Research Fellows in Heterogeneous Integration |
| School/Department: | Centre for Quantum Materials and Technology (CQMT) |
| Reference: | 23/111481 |
| Closing Date: | Monday 15 January 2024 |
| Salary: | £37,841 - £41,331 per annum |
| Anticipated Interview Date: | Monday 5 February 2024 |
| Duration: | Fixed term until 30 November 2026 |

JOB PURPOSE:

To be a highly productive, ambitious and collaborative member of the UKRI Strength in Places Fund Programme Smart Nano NI who will assist in the delivery of research, designs and prototypes of photonic devices.

The research and development will encompass the integration processes and packaging approaches for photonic, imaging and microfluidics structures and systems to tackle challenges from telecommunications, data storage and medtech.

You will have experience in electronics, photonics or microfluidics research augmented by characterisation, metrology and test. Your track record will have an understanding and hands on experience of dicing tools, die bonders, ball and wedge bonding, bond testing, reflow ovens etc. This should be supported with knowledge of integration process and performance evaluation. Successful applicants will have responsibilities in independent research, supervision, planning, day to day lab management and experience liaising with external suppliers and fabricators to realise finished, deliverable projects for industrial collaborations supporting the Smart Nano NI project.

MAJOR DUTIES:

1. To lead on the research/development of heterogeneous integration processes and equipment to enable components/prototypes to be fabricated for photonic, biosensing and medical imaging devices.
2. To develop research and development plans to support creation of new idea/concepts and devices.
3. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
4. Identify and develop opportunities to develop impact case studies arising from the research.
5. Disseminate research findings at appropriate national and international technical events and conferences.
6. Within the research project, take the lead in setting research objectives and programme of implementation.
7. Direct, coach and develop more junior research staff and technical support where appropriate.
8. Ensure that research projects are completed on time and within budget.
9. Contribute through limited teaching such as undergraduate project supervision.
10. Be responsible for practical work where applicable and advise students on techniques.

ESSENTIAL CRITERIA:

1. A degree in physics, mechanical, electrical or biomedical engineering or a related discipline.
Normally have, or be about to obtain, a PhD/EngD in physics, mechanical, electrical or biomedical engineering or a related discipline or have an at least 3 years relevant industrial experience.
(NB 'About to obtain' is normally defined as within 3 months of application date).

2. Specific, relevant research/development experience to include:
 - Demonstrated expertise photonic, electronic or other integrated device fabrication that goes beyond basic thin film synthesis or trivial structures.
 - Demonstrated expertise in device integration processes.
 - Experience performing original research, demonstrated through a record of invention, original publications in top-tier journals, and conference papers and presentations or IP filings.
3. Ability to devise, advise on and manage related research programmes.
4. Experience, achievement and growing reputation in the discipline, reflected in relevant national committee memberships and/or involvement in national research events.
5. Ability to supervise work of others in research team.
6. Ability to communicate complex concepts/ information effectively verbally and through appropriate presentation modes.
7. Ability to manage resources.
8. Demonstrable intellectual ability.
9. Commitment to continuous professional development.

DESIRABLE CRITERIA:

1. A PhD/EngD background of research/development in the area of optical / photonic devices/systems.
2. Evidence or demonstrated experience of optical/photonic device/systems in medtech.
3. Evidence of experience with electronic device packaging.
4. Evidence of experience with microfabrication process development.
5. Evidence of experience with process integration.
6. Evidence of experience with metrology, electrical characterization, and failure analysis.
7. Evidence of experience with photomask layout, PCB-layout, and/or mechanical design (SolidWorks or Fusion 360).
8. Experience with design of experiments, device testing, data and analysis acquisition, and/or programming (MATLAB, Python, LabView).
9. Evidence of experience in using software for optical/photonic device simulations using, for example, COMSOL, Zemax Optical Design, Matlab/Simulink, Ansys/Lumerical codes etc.
10. A sense of commercial awareness, with knowledge and experience of procedures involving filing a patent and licence agreement.
11. Evidence of engagement in education activities such as undergraduate teaching support or project supervision or its direct support or other recognised teaching duties
12. Evidence or experience of working with or developing industry collaborative projects/programmes.
13. Contributed/invited talks at significant international conferences.
14. Presentations to non-specialist audiences.
15. Evidence of delegated resource management responsibility.
16. Evidence of assuming roles within a larger research team.