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| Last updated: | July 2019 |

**JOB DESCRIPTION**

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| Post title: | **Research Fellow: Integrated ATR and Raman Photonic Chip for Rapid Bedside Biomarker Diagnostics** |
| School: | Optical Research Centre |
| Faculty: | Faculty of Engineering and Physical Sciences |
| Career pathway: | ERE\* | Level: | 4 |
| \*ERE category: | Research pathway |
| Posts responsible to: |  |
| Posts responsible for: | Some day-to-day supervision of PhD students |
| Post base: | Office-based/Non Office-based (see job hazard analysis) |

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| Job purpose |
| To undertake fundamental and applied research into optical chips (modelling, microfabrication and characterisation) for Mid-IR and Raman spectroscopies for biomedical diagnostics. |

| Key accountabilities/primary responsibilities | % Time |
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|  | To conduct individual research into integrated photonic devices and instrumentation for biomedical diagnostics and their application in the clinical environment, generating a substantial body of novel research results according to the agreed research programme.The responsibilities include (but not limited to) the following:* Electromagnetic modelling of optoelectronic devices such as microresonators and microprisms
* Materials selection and validation
* Microfabrication of photonic chips in the cleanroom environment
* Characterisation of these chips in the Visible, NIR and Mid-IR wavelengths
* Building a customised Mid-IR/Raman combo spectrometer suitable for the fabricated chips
* Evanescent wave spectroscopy (Mid-IR and Raman) – modelling and measurements
* Clinical application of Mid-IR and Raman spectroscopies using these chips
 | 65 % |
|  | To collaborate with researchers in the Optoelectronics Research Centre, the Faculty of Medicine and researchers in other institutions to achieve project goals. | 10 % |
|  | To disseminate findings by taking the lead in preparing publication materials for leading refereed journals and presenting results at international conferences, to engage in occasional public outreach activities and to contribute towards the generation and protection of intellectual property. | 10 % |
|  | To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control. | 5 % |
|  | To assist in the supervision of PhD students and carry out occasional undergraduate supervision, demonstrating or lecturing duties within own area of expertise, under the direct guidance of a member of academic staff. | 5 % |
|  | Any other duties as allocated by the line manager following consultation with the post holder. | 5 % |

| Internal and external relationships |
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| Responsible to Dr. Senthil Murugan Ganapathy as Principal Investigator. Close working with co-investigators Prof James Wilkinson, Prof Antony Postle and Prof Howard Clark.Working relationships with research staff, experimental officers, technicians and students throughout the ORC.Close links with Faculty of Medicine for collaborative research.Working links with University procurement staff and with equipment, consumables and software manufacturers and suppliers to ensure low-waste, high-quality provision of an up-to-date working environment. |

| Special Requirements |
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| *Applications for Research Fellow positions will be considered from candidates who are working towards or nearing completion of a relevant PhD qualification. The title of Research Fellow will be applied upon successful completion of the PhD. Prior to the qualification being awarded the title of* ***Senior Research Assistant*** *will be given.* |

**PERSON SPECIFICATION**

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| Criteria | Essential | Desirable | How to be assessed |
| Qualifications, knowledge and experience | PhD or equivalent professional qualifications in an appropriate scientific/engineering discipline.Detailed understanding and knowledge of photonics, spectroscopy and optical instrumentationSubstantial experimental research experienceIn-depth knowledge of optoelectronics, spectroscopy and optical instrumentation. Experience in microphotonic device modelling | Experience of software for instrumentation.Experience of cleanroom processes.Experience of Labview or equivalent. | Application/Interview |
| Planning and organising | Able to organise own research activities to deadline and quality standards |  | Interview |
| Problem solving and initiative | Able to develop understanding of complex problems and apply in-depth knowledge to address themAble to develop original techniques/methods |  | Application/InterviewApplication |
| Management and teamwork | Able to contribute to supervision of PhD studentsWork effectively in a team, understanding the strengths and weaknesses of others to help teamwork development | Able to contribute to school management and administrative processes | InterviewInterviewInterview |
| Communicating and influencing | Communicate new and complex information effectively, both verbally and in writing, engaging the interest and enthusiasm of the target audienceAble to present research results at group meetings and conferencesExcellent publication recordSuccessful research outcomesWork proactively with colleagues in other work areas/institutions, contributing specialist knowledge to achieve outcomes |  | Application/InterviewApplication/InterviewApplicationApplication/Interview |
| Other skills and behaviours | Understanding of relevant Health & Safety issuesPositive attitude to colleagues and students |  | InterviewInterview/References |
| Special requirements | Able to attend national and international conferences to present research resultsCleanroom working |  | Application/InterviewApplication/Interview |

**JOB HAZARD ANALYSIS**

**Is this an office-based post?**

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| [ ]  Yes | If this post is an office-based job with routine office hazards (eg: use of VDU), no further information needs to be supplied. Do not complete the section below. |
| [x]  No | If this post is not office-based or has some hazards other than routine office (eg: more than use of VDU) please complete the analysis below.Hiring managers are asked to complete this section as accurately as possible to ensure the safety of the post-holder. |

## - HR will send a full PEHQ to all applicants for this position. Please note, if full health clearance is required for a role, this will apply to all individuals, including existing members of staff.

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| **ENVIRONMENTAL EXPOSURES** | **Occasionally** (<30% of time) | **Frequently**(30-60% of time) | **Constantly**(> 60% of time) |
| Outside work  |  |  |  |
| Extremes of temperature (eg: fridge/ furnace) |  |  |  |
| ## Potential for exposure to body fluids |  |  |  |
| ## Noise (greater than 80 dba - 8 hrs twa) |  |  |  |
| ## Exposure to hazardous substances (eg: solvents, liquids, dust, fumes, biohazards). Specify below: |  | ✓ |  |
| Frequent hand washing |  |  |  |
| Ionising radiation  |  |  |  |
| **EQUIPMENT/TOOLS/MACHINES USED** |
| ## Food handling  |  |  |  |
| ## Driving university vehicles(eg: car/van/LGV/PCV)  |  |  |  |
| ## Use of latex gloves (prohibited unless specific clinical necessity) |  |  |  |
| ## Vibrating tools (eg: strimmers, hammer drill, lawnmowers)  |  |  |  |
| **PHYSICAL ABILITIES** |
| Load manual handling |  |  |  |
| Repetitive crouching/kneeling/stooping |  |  |  |
| Repetitive pulling/pushing |  |  |  |
| Repetitive lifting |  |  |  |
| Standing for prolonged periods |  | ✓ |  |
| Repetitive climbing (ie: steps, stools, ladders, stairs) |  |  |  |
| Fine motor grips (eg: pipetting) |  |  |  |
| Gross motor grips |  |  |  |
| Repetitive reaching below shoulder height |  |  |  |
| Repetitive reaching at shoulder height |  |  |  |
| Repetitive reaching above shoulder height |  |  |  |
| **PSYCHOSOCIAL ISSUES** |
| Face to face contact with public |  |  |  |
| Lone working |  |  |  |
| ## Shift work/night work/on call duties  |  |  |  |