



<b>Job title</b>	Senior Research Fellow in novel metal hydrides solid-state hydrogen stores and compressors	<b>Job family and level</b>	Research and Teaching Level 5
<b>School/ Department</b>	Faculty of Engineering – Advanced Materials Research Group	<b>Location</b>	Research Acceleration and Demonstration (RAD) Building, Jubilee Campus

## Purpose of role

### Novel metal hydrides, solid-state hydrogen stores and compressors

We are recruiting a Senior Research Engineer for the Hydrogen Research Group currently consisting of 5 academics, 9 research fellows and 15 PhD students. The successful applicant will be joining a multidisciplinary research team collaborating on the optimisation of metal hydrides and/or the design of solid-state hydrogen stores and compressors.

This role will focus on multiple projects where the successful candidate will take a central role in managing and developing solid-state hydrogen technology, including building and utilisation of a one-of-a-kind high pressure Sieverts apparatus with a maximum pressure of 1000 bar, multiple stage metal hydride compressors, high performance metal hydride storage tanks and system integration, and involvement in developing next generation hydride materials.

	<b>Main responsibilities</b> (Primary accountabilities and responsibilities expected to fulfil the role)	<b>% time per year</b>
1	<b>Research activities:</b> Lead the laboratory and research initiatives including the design and development of unique facilities in the hydrogen group's solid state energy storage and compressor technologies. Examples include Design of a high-pressure Sieverts apparatus, high performance hydride stores and compressors. This also includes design and model of heat transfer solutions for more efficient energy stores as well as solid state compressors. Requires expertise in Multiphysics modelling of performance using COMSOL. The research includes the design, build and testing of these prototypes. Innovate, develop and integrate next generation hydrogen storage with applied systems to work with industry. Conduct extensive testing of hydride materials using the high-pressure Sieverts apparatus and prototype systems, providing empirical data for the validation of numerical models. Develop and fully characterise new hydride materials suitable for compressors and stores. Explore integration of systems across a wide range of stationery and transport applications. Collaborate external and internally and, lead and engage actively with other team members. Follow the Faculty health and safety procedures, ensuring experiments and the lab is a safe working environment.	50%

2	<p><b>Project management:</b> Take responsibility for managing day-to-day workload ensuring that work progresses to successfully meet deadlines for multiple local and multicentre project deliverables. In particular on WPs related to current and future projects. Take the lead in conducting design work, modelling, and experimental testing. Organise project delivery sequencing. Take the lead in writing and presenting reports and technical papers to the other researchers and stakeholders of the projects. Liaising with support staff and associate staff to ensure that work runs smoothly. Identify any CPD training to benefit the project and/or for career development.</p>	15%
3	<p><b>Dissemination:</b> Writing of research reports and papers in order to develop a track-record of published research findings in leading peer-reviewed journals. Preparing research presentations and papers in order to disseminate results, attending and presenting at internal/external seminars and national/international conferences.</p>	15%
4	<p><b>Further research:</b> Preparing material and costings to support new and follow-on research projects. Collaborating and co-leading with colleagues to prepare grant applications/proposals to external bodies to fund new research. Supporting career development such as prestigious fellowship applications.</p>	10%
6	<p><b>Community support:</b> supervision of UG/PGT project students and PhD students; training/mentoring for junior researchers; STEM outreach; being engaged with an interest group (examples Engineering Research Futures, researcher groups, BME Staff Network, Ignite EDI Network+)</p>	5%
7	<p><b>Miscellaneous:</b> You may occasionally be asked to perform other duties which are not included in the above but appropriate to the grade and consistent with the role</p>	5%

## Person specification

	Essential	Desirable
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Able to provide creative and imaginative solutions to meet technical objectives / engineering challenges</li> <li>• Use of COMSOL numerical model for the simulation of engineered devices/systems</li> <li>• Ability to analyse and present data</li> <li>• Ability to present complex information effectively to a range of audiences</li> <li>• Ability to work collaboratively in a diverse team</li> <li>• Leadership in developing new ideas and new project directions</li> <li>• able to lead the laboratory and research initiatives including the design and development of unique facilities in the hydrogen group's solid state energy storage and compressor technologies</li> <li>• Excellent verbal and written communication skills</li> <li>• Ability to work independently</li> </ul>	<ul style="list-style-type: none"> <li>• Fluency in MATLAB, LabVIEW, or similar data acquisition system languages</li> <li>• Experience in the building and use of Sieverts machines for the determination of hydrogen sorption properties and PCT's.</li> <li>• Demonstrated community support activity</li> </ul>
<b>Knowledge and experience</b>	<ul style="list-style-type: none"> <li>• Strong understanding of the properties of metal alloys / metal hydrides</li> <li>• the use of Multiphysics modelling software (such as COMSOL) to design and optimise thermal management strategies and metal hydride reaction kinetics</li> <li>• Extensive hands-on laboratory experience and knowledge of experimental methods related to solid state hydrogen storage, including building and testing.</li> <li>• Experience in applying processing engineering principles to hydrogen storage systems</li> <li>• Experience of the testing and performance of metal hydride reactor design including thermal management</li> <li>• Evidence of independent research development that has contributed to new understanding in the field of hydrogen or energy research; including writing grants in the field of hydrogen storage working with industry.</li> <li>• Evidence of collaborative and contract research involving</li> </ul>	<ul style="list-style-type: none"> <li>• Experience in initiatives that enhance the research environment</li> </ul>

	<p>commercial partners and other stakeholders.</p> <ul style="list-style-type: none"> <li>• Managing/supervising researchers and PhD students and demonstrating leadership in a research environment</li> <li>• experience of building lab scale and prototype solid-state hydrogen technology</li> <li>• building experimental equipment to characterise the thermodynamics and kinetics of hydrides</li> </ul>	
<p><b>Qualifications, certification and training (relevant to role)</b></p>	<ul style="list-style-type: none"> <li>• PhD awarded by an internationally recognised university in Mechanical Engineering, Chemical Engineering, Materials Engineering, Applied Physics, or another relevant field.</li> <li>• PDRA experience</li> </ul>	



## Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

- Valuing people** Is always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.
- Taking ownership** Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.
- Forward thinking** Driven to question the status quo and explore new ideas, supporting the team to "lead the way" in terms of know-how and learning.
- Professional pride** Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.
- Always inclusive** Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

## Key relationships with others

