



<b>Job title</b>	Research Fellow in supercritical fluid modelling	<b>Job family and level</b>	Research and Teaching Level 4
<b>School/ Department</b>	Faculty of Engineering – Advanced Materials Research Group	<b>Location</b>	University Park

## Purpose of role

A postdoctoral researcher is required to work on an EPSRC project focussed on the delivery of artificial intelligence self-optimising continuous hydrothermal reactors for the synthesis of nanomaterials. The project will be partly around the build and operation of the reactors themselves and also around the modelling of the mixing dynamics inside the reactors.

	<b>Main responsibilities</b> (Primary accountabilities and responsibilities expected to fulfil the role)	<b>% time per year</b>
1	To build supercritical water rigs and operate them to synthesis nanomaterials. The model supercritical fluid mixing using image analysis and pseudo fluid mixing systems. To develop IA based models to link synthesis with mixing and other variables inside a supercritical water continuous flow reactor.	70%
2	Production of reports, publications, presentations and travel to meetings with industry and scientific community.	10%
3	Liaison meetings with project sponsor and its subsidiaries.	5%
4	Supervision of project students.	5%
5	Any other duties appropriate to this post as required by their line manager.	5%
6	Any other duties appropriate to this post as required by their line manager	5%



## Person specification

	Essential	Desirable
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Skills in matlab and computational modelling.</li> <li>• Strong organisational skills and project management.</li> <li>• Ability to find, read, assess, and summarise published relevant research literature.</li> <li>• Excellent communication and presentation skills</li> <li>• Interpersonal skills</li> <li>• Programming skills</li> <li>• Skills in visual modelling of scientific information</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical engineering background</li> <li>• Programming skills</li> </ul>
<b>Knowledge and experience</b>	<ul style="list-style-type: none"> <li>• Experience in building high pressure reactors</li> <li>• Process control systems for high pressure reactors</li> <li>• Experience in the use of relevant software based modelling, using MATLAB-Simulink.</li> <li>• proven publishing track record</li> <li>• Experience in 'flow based chemistry', hydrothermal flow chemistry</li> <li>• Knowledge of image analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Experience of writing MATLAB code</li> <li>• Closely liaising with external partners.</li> </ul>
<b>Qualifications, certification and training (relevant to role)</b>	<ul style="list-style-type: none"> <li>• PhD in Chemistry, Flow Chemistry or Chemical Sciences</li> </ul>	<ul style="list-style-type: none"> <li>• PhD with synthesis of materials in supercritical fluids</li> </ul>



The University strongly endorses Athena SWAN principles, with commitment from all levels of the organisation in furthering women's careers. It is our mission to ensure equal opportunity, best working practices and fair policies for all.

## 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:

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|---------------------------|--|
| <b>Valuing people</b>     | 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.   |
| <b>Taking ownership</b>   | 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.  |
| <b>Forward thinking</b>   | Driven to question the status quo and explore new ideas, supporting the team to "lead the way" in terms of know-how and learning.  |
| <b>Professional pride</b> | 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.   |
| <b>Always inclusive</b>   | 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

