

<b>Position Title</b>	Research Fellow - Fluid Science and Resources
<b>Classification</b>	Level B
<b>School/Division</b>	School of Engineering
<b>Centre/Section</b>	Chemical Engineering
<b>Supervisor Title</b>	Professor
<b>Supervisor Position Number</b>	308999
<b>Position Number</b>	NEW

### Your work area

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The UWA School of Engineering is renowned for its award-winning researchers, teachers and facilities. It is a multidisciplinary school offering education and research in a number of engineering disciplines. This includes civil, environmental, mining, chemical mechanical, electrical and electronic engineering. Successful applicants will work primarily in the Fluid Science and Resources Research (FSRR) Group (<http://www.fsr.ecm.uwa.edu.au/>) which primarily conducts research across the resources industry as well as the Future Energy Exports CRC. The relevant theme to this project is the development of hydrogen production and export technology.

### Reporting structure

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Reports to: Professor

Dotted line reports to: Senior Research Fellow

### Your role

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Hydrogen liquefaction has emerged as a promising transportation method due to its high energy density and hydrogen purity, but it is currently prohibitively expensive. In this project, we will exploit the peculiar spin physics of hydrogen to alleviate liquefaction costs by providing controllable refrigeration (so-called 'cold energy') following regasification. In particular, the successful applicant will measure, optimise and exploit the highly endothermic catalysed conversion of para- to ortho-hydrogen, which can provide up to 525 kJ/kg of cooling at convenient temperatures. This project will require a substantial body of work to design and construct a novel plate-fin heat exchanger and execute various experiments required to both quantify the hydrogen para-ortho conversion kinetics as well as the heat transfer performance improvements realised.

### Your key responsibilities

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Conduct high-quality research on the project

Publication of research papers and presentations at international conferences and workshops

Manage the relationship with various collaborators on aspects of the project

Assist in the supervision of undergraduate, Masters and PhD students.

Participate in the research group's activities and contribute to group projects, meetings, and workshops.

Other duties as directed

### **Your specific work capabilities (selection criteria)**

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Have a PhD in Chemical Engineering

Strong track record of research publication relative to opportunity

Experience with ortho-para hydrogen characterisation using Raman spectroscopy and Raman imaging

Experience with high-pressure and cryogenic equipment and flammable gas handling

Experience with the design/development/construction of experimental apparatus based on

Hazard and operability (HAZOP) studies

Ability to manage research projects

### **Special requirements (selection criteria)**

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Occasional weekend work

### **Compliance**

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Ensure you are aware of and comply with legislation and University policy relevant to the duties undertaken, including:

The University's Code of Conduct [hr.uwa.edu.au/policies/policies/conduct/code/conduct](http://hr.uwa.edu.au/policies/policies/conduct/code/conduct)

Inclusion and Diversity [web.uwa.edu.au/inclusion-diversity](http://web.uwa.edu.au/inclusion-diversity)

Safety, health and wellbeing [safety.uwa.edu.au/](http://safety.uwa.edu.au/)