



POSITION DESCRIPTION

Department of Chemical Engineering
Melbourne School of Engineering, The University of Melbourne

Research Fellow in Ceramic 3D Printing

POSITION NO	0049251
CLASSIFICATION	Research Fellow, Level A
SALARY	\$72,083 - \$97,812 p.a
SUPERANNUATION	Employer contribution of 9.5%
EMPLOYMENT TYPE	Full-time position available for 12 months <i>The Melbourne School of Engineering is strongly committed to supporting diversity and flexibility in the workplace. Applications for part-time or other flexible working arrangements will be welcomed and will be fully considered subject to meeting the inherent requirements of the position.</i>
OTHER BENEFITS	http://about.unimelb.edu.au/careers/working/benefits
HOW TO APPLY	Online applications are preferred. Go to http://hr.unimelb.edu.au/careers , under 'Job Search and Job Alerts', select the relevant option ('Current Staff' or 'Prospective Staff'), then find the position by title or number.
CONTACT FOR ENQUIRIES ONLY	Professor George Franks Tel: +61 8344 9020 Email: gvfranks@unimelb.edu.au <i>Please do not send your application to this contact</i>

For information about working for the University of Melbourne, visit our websites:

hr.unimelb.edu.au/careers
joining.unimelb.edu.au

The University of Melbourne

Established in 1853, the University of Melbourne is a public-spirited institution that makes distinctive contributions to society in research, learning and teaching and engagement. It's consistently ranked among the leading universities in the world, with international rankings of world universities placing it as number 1 in Australia and number 32 in the world (Times Higher Education World University Rankings 2017-2018).

<https://about.unimelb.edu.au/strategy/growing-esteem>

Melbourne School of Engineering

Melbourne School of Engineering (MSE) has been the leading Australian provider of engineering and IT education and research for over 150 years. We are a multidisciplinary School organised into three key areas; Computing and Information Systems (CIS), Chemical and Biomedical Engineering (CBE) and Electrical, Mechanical and Infrastructure Engineering (EMI). MSE continues to attract top staff and students with a global reputation and has a commitment to knowledge for the betterment of society.

Our ten-year strategy, MSE 2025, is our School's commitment to bring to life the University-wide strategy *Growing Esteem* and reinforce the University of Melbourne's position as one of the best in the world. Investment in new infrastructure, strengthening industry engagement and growing the size and diversity of our staff and student base to drive innovation and develop the transformative technologies of the future are all fundamental principles underpinning MSE 2025.

<http://www.eng.unimelb.edu.au/about/join-mse/why-join-mse>

School of Chemical and Biomedical Engineering (CBE)

The CBE School integrates the expertise and capabilities of the Chemical and the Biomedical Engineering Departments. The resulting mix of skills creates new horizons for engineering and enables the realisation of transformative new ideas into practical innovations. This ranges from the development of bionic prosthetic implants to remediation of Antarctic landscapes. The sweep of technological applications is vast, and we are focused on end-use inspired research.

We encompass mining, energy, material science, the environment, medical devices, medical imaging, drug delivery and food production. Our goal is to facilitate knowledge acquisition, research excellence, and its translation into technological, societal, industrial and medical innovation.

Position Summary

In this position you will play a key role in research projects in the field of colloidal ceramic powder processing working under the supervision of Professor George V. Franks. Our research aims to develop improved understanding of processing-structure-property relationships in ceramics produced by wet processing methods.

You will contribute to our research through developing a program to investigate the microstructure of ceramics and develop sintering conditions for densification of ceramics. You will create formulations and processing routes for producing paste ink formulations and determine printing parameters for 3D printed non-oxide ceramics via direct ink writing. You will characterise the phase composition and microstructure of advanced ceramic materials. These materials have application in the defence industries.

In this role you will publish your outcomes in peer reviewed journals and produce quarterly progress reports. Leading the day-to-day operation of a small research lab, including maintaining stocks of routine supplies, chemical safety documentation and inductions and co-supervising undergraduate and PhD research students. When required you may also undertake teaching and research supervision directly related to your area of research.

You will be an active member of CBE collaborating with other researchers. With strong interpersonal skills that will be imperative in assisting you to form productive working relationships with key stakeholders internally and with our Industry partners.

1. Selection Criteria

1.1 ESSENTIAL

- ▶ PhD in Materials, Chemistry, Physics or Engineering; with a track record in research, and sound publication record
- ▶ Extensive experience in ceramic powder processing, and experience in microstructural characterisation and ceramic 3D printing
- ▶ Excellent problem-solving skills with experience in combining information from many different analytical tools in pursuit of the solution to important problems in materials engineering
- ▶ Experience in working with minimal supervision, and ability to prioritise tasks to achieve project objectives within timelines.
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- ▶ Outstanding communication skills, both oral and written.
- ▶ Highly developed interpersonal skills including demonstrated ability to work co-operatively in a multi-disciplinary team environment and liaise with associates from diverse backgrounds.
- ▶ Desire to work on defence related research.

1.2 DESIRABLE

- ▶ Experience in laboratory scale processing and characterisation equipment design, procurement and commissioning.
- ▶ Demonstrated understanding of the general principles of colloid and surface chemistry.
- ▶ Ability to undertake studies in suspension rheology.
- ▶ Experience in the characterization of ceramic powder and colloidal systems.
- ▶ Familiarity with ceramic 3D printing via Direct Ink Writing (paste extrusion) technique.
- ▶ Familiarity with mechanical property characterisation of ceramics.
- ▶ High level of computer literacy and experience.
- ▶ Experience in producing virtual representation of 3D objects for input to 3D printers
- ▶ Refereed publications in international journals arising from their research
- ▶ Experience in postgraduate student supervision
- ▶ A track record in the preparation of grant applications
- ▶ Experience as a member or leader of a research team
- ▶ Australian or allied Citizenship or permanent residency

2. Key Responsibilities

- ▶ Develop formulations and printing parameters for 3D printing multiscale porous ceramics via direct ink writing of paste formulations.
- ▶ Operating and maintaining 3D printing apparatus.
- ▶ Characterise non-oxide ceramics microstructure and phase analysis using SEM, XRD, density etc.
- ▶ Responsible for the safe day-to-day operation and management of the laboratory including ordering and storing chemicals.
- ▶ Maintaining safety documentation in the lab including, MSDS sheets, chemical handling and storage, routine inspections, inductions and risk assessments.
- ▶ Operating and maintaining ceramic sintering furnaces.
- ▶ Maintain confidentiality regarding results that are of defence or commercial interest.
- ▶ Contribution to the preparation, or where appropriate individual preparation, of research proposal submissions to external funding bodies.
- ▶ Involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise.
- ▶ Administrative functions primarily connected with his/her area of research.

The position description should be read alongside [Academic Career Benchmarks and Indicators](#)

2.1 RESEARCH AND RESEARCH TRAINING

- ▶ Participate in research independently and as a member of a research team.
- ▶ Develop experimental methods and standard operating procedures.
- ▶ Conduct experiments in a safe and careful manner, paying attention to experimental error
- ▶ Produce publications arising from research in peer reviewed journals.
- ▶ Supervision or co-supervision of Masters student research projects within the research area.

2.2 LEADERSHIP AND SERVICE

- ▶ Active participation in the communication and dissemination of research.
- ▶ Identification of sources of funding to support individual or collaborative projects.
- ▶ Active participation within the research group and Departmental committees as required.

2.3 ENGAGEMENT

- ▶ Active participation in outreach activities relating to the research, including promotion of the research through media channels and advocacy groups.
- ▶ Effective liaison with external networks to foster collaborative partnerships.
- ▶ Involvement in professional activities, including consultations and referrals.
- ▶ Occupational Health and Safety (OH&S) and Environmental Health and Safety (EH&S) responsibilities as outlined in section 3.

3. Occupational Health and Safety (OHS)

All staff are required to take reasonable care for their own health and safety and that of other personnel who may be affected by their conduct.

OHS responsibilities applicable to positions are published at:

<http://safety.unimelb.edu.au/topics/responsibilities/>

These include general staff responsibilities and those additional responsibilities that apply for Managers and Supervisors and other Personnel.