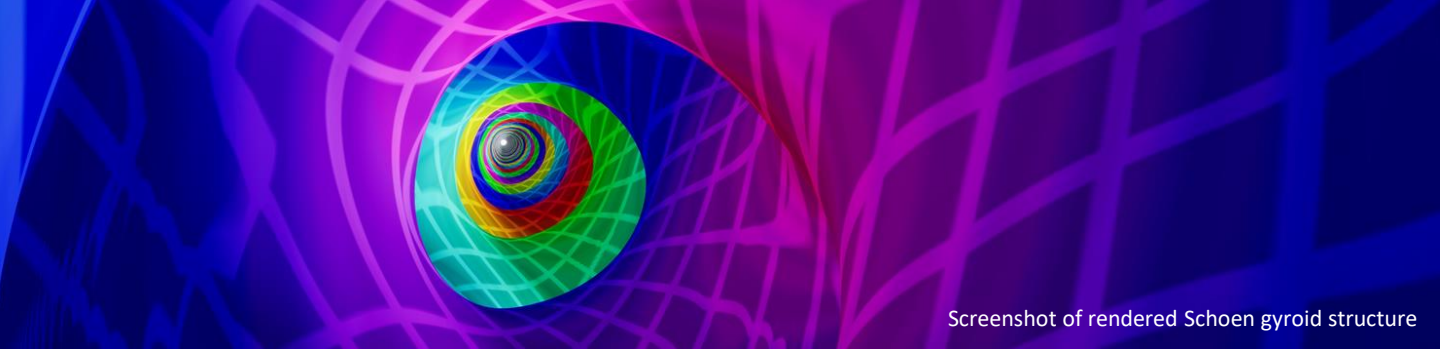


Screenshot of rendered Schoen gyroid structure

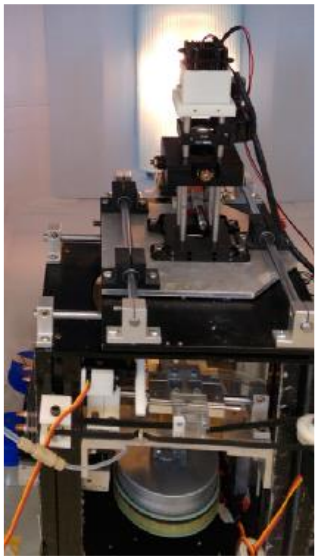
Are you a final year engineering, physics or computer science student or a recent graduate looking for your next opportunity?

Have you considered post-graduate research here in New Zealand?

We're seeking highly motivated PhD applicants to join our ambitious research programme exploring how 3D printing can revolutionise manufacturing processes in chemical engineering.

Heat exchanger, just one of the potential applications of our work

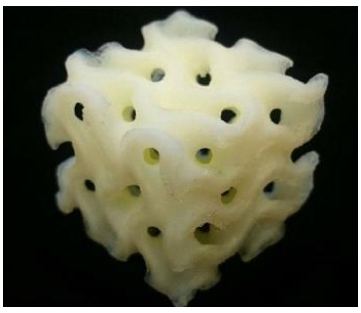
Typically, chemical engineering applications such as heat exchangers, reactors, adsorption and chromatography columns connect a fluid with a solid phase through fixed beds of randomly packed particles, known as porous media. Chemical engineering design then involves maximising the heat and/or mass transfer rate, whilst minimising the pressure drop. Traditionally, our design choices have been limited to changing the particle size and shape.



3D printer developed for 3D printing of cellulose hydrogels

Our research shows that 3D printing introduces new possibilities to the design of the solid phase, potentially enabling game changing performance in a variety of applications. However, there's a lot we don't yet know about how to apply the engineering science and computational tools to design and 3D print porous media.

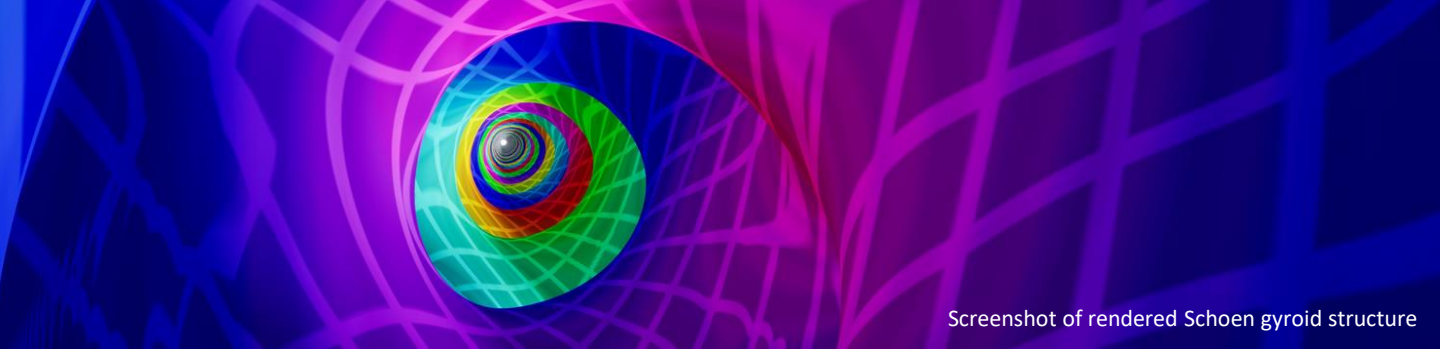
Our research programme addresses all aspects of 3D printing in chemical engineering, from the design of the pore structure and solid materials, to the design of the 3D printers themselves. Our ambitious and enthusiastic team comprises chemical engineers, mechanical engineers, biologists, computer scientists and materials scientists.



Gyroid triply periodic minimal surface lattice made by 3D printing

We're looking for talented, driven PhD applicants

We're looking for PhD applicants with excellent academic records and strong written skills. We want people who can demonstrate outstanding ability in numerical methods, lab-based measurements, machine learning or computer graphics, or some combination of these. You'll need to demonstrate an aptitude to learn a broad range of new skills, including those outside your existing discipline.



Screenshot of rendered Schoen gyroid structure

PhD topics available include

- Investigation of fluid flow inside 3D printed geometries by Magnetic Resonance Imaging (MRI)
- Optimisation of porous geometries using machine learning
- Developing efficient computational representations of fine porous structures for Computer Aided Design (CAD)
- Computational Fluid Dynamics (CFD) characterisation of heat and mass transfer in structured porous materials
- Design, fabrication and testing of 3D printed heat exchangers
- Developing and characterising applications of structured porous materials such as catalytic reactors, tissue scaffolds and purification processes

What we offer

We're offering a competitive tax-free stipend of $27,500 per year for three years. Funding also covers tuition fees and research project consumable costs.

The programme is a collaboration between the University of Canterbury in Christchurch, Victoria University in Wellington, the University of Otago in Dunedin and Callaghan Innovation. We're hosted by the Biomolecular Interaction Centre at the University of Canterbury. As a PhD student in our programme, you'll join an interdisciplinary team of more than 25 academics, post-docs and PhD students. Depending on your skillset and experience, combined with your research and career ambitions, we have opportunities based in Christchurch, Wellington and Dunedin.

Expressions of interest and to find out more

If you'd like to have an informal conversation to find out more about our work and the post-graduate opportunities available, please email ria.chapman@canterbury.ac.nz.

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