2 x Funded PhD Studentships

Technological Development of Ion Pipette Aspiration

Supervision Team:
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Many types of microparticle are soft: they deform and even flow when they are squashed and squeezed. The mechanical (or more fully, rheological) behaviour of these particles turns out to be very important for very many research fields. For example, there are open research questions about the mechanics of the cells that make up our bodies, eggs used for in vitro fertilization, colloids that make up food and beverages, the zoospores of Kauri Dieback, and the liposomes that carry medical payloads such as the new RNA vaccines.

Researchers, clinicians and technicians working with these soft particles do not typically have the equipment to easily measure their mechanical properties. This project will develop portable, adaptable technology known as 'Ion Pipette Aspiration' for quick, accurate and effective mechanical measurements. During development, the technology will be deployed via collaborations with a network of experts across many academic disciplines, with the aim of producing a series of first-of-their-kind research studies.

Two fully-funded PhD studentships are available to support this project. This represents a rare opportunity to carry out transdisciplinary work collaborating with a range of highly-skilled academic groups. There will be opportunities for international travel, and we anticipate high-impact research outputs to go alongside technological developments. We are looking for students with a strong Honours or Masters degree in soft matter physics, physical or analytical chemistry, engineering, or a related field.

- **Student 1** will carry out collaborative experiments using small, soft microparticles, probing the limits of what can be achieved. They will use the resulting data to develop the models and methods required to measure mechanical properties.
- **Student 2** will focus on the hardware required for technological development, and will work to continuously improve the technology based on user feedback. This work will combine microfluidic fabrication with electronics, and eventually with optics.

The project is affiliated with two of New Zealand's Centres of Research Excellence (the MacDiarmid Institute and the Dodd-Walls Centre), providing access to excellent academic and practical training, and to a comprehensive range of tools and expertise throughout New Zealand. Students will benefit from the MacDiarmid Institute's thriving postgraduate community which delivers various opportunities for personal development. For example, the CRISP programme offers vocational training to enable a smooth transition into an exciting career beyond the PhD.

The project is funded by New Zealand's Ministry for Business, Innovation and Employment via a Smart Ideas grant, and studentships will be administered through the Department of Physics at the University of Auckland. The tax-free stipend is $33,000 NZD per year for three years and all tuition fees will be covered. Review of applications will start immediately and continue until the positions are filled, with the aim of commencing the project by the start of 2024. Applications should include a CV, academic transcripts, and a brief (1 page max) statement of research experience. Applicants should specify which of the two studentships they would prefer, and demonstrate that they fulfil the University of Auckland's English language requirements. They should provide the names of at least two people who can provide personal letters of reference. Students will be selected with attention to equity and diversity.

For further information and to apply, please contact:

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Profile and Research Pages
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