Funded PhD Studentship

Connecting Structure and Rheology in Dairy Protein Concentrates

Supervision Team:
Assoc. Prof. Geoff Willmott (The University of Auckland)
Dr. Davoud Zare (Fonterra Research and Development Center, Palmerston North)
Assoc. Prof. Catherine Whitby (Massey University)

Location: Fonterra Research and Development Center, Palmerston North, New Zealand

Dairy protein concentrates are soft colloidal suspensions which interact with each other, forming complex microstructures with properties that depend on the solid content. New and improved concentrated dairy products are constantly being designed for their nutritional value and health benefits. Improvements to protein manufacturing are also very important for global sustainability goals. Effective processing and handling of newly-developed dairy products is an important issue, and this PhD project is focussed on fundamental aspects of the structure and rheology of these products.

The goal of the project is to use both theory and experiments to develop physics-based (rather than empirical) rheological models for emerging products. Models will be validated using experimental data available in the literature and/or using in-house experiments. Therefore, we are looking for a student with a strong Honours or Masters degree in soft matter physics, materials science, physical chemistry, engineering or a related field. Experience with rheology (and especially rheological models) would be an advantage.

The project is funded by Fonterra, one of the world's largest dairy companies. It represents a rare opportunity to carry out research embedded with the expert team at Fonterra's Research and Development Center, in Palmerston North, New Zealand. See manawatunz.co.nz to learn more about Palmerston North and the Manawatū region. The project is also affiliated with the MacDiarmid Institute for Advanced Materials and Nanotechnology (www.macdiarmid.ac.nz), one of New Zealand's Centres of Research Excellence, and the interdisciplinary supervision team will provide access to a comprehensive range of materials characterization tools and expertise throughout New Zealand. The studentship will be administered through the Department of Physics at the University of Auckland.

The student will benefit from extensive collaboration and a thriving postgraduate community within The MacDiarmid Institute. Aside from excellent academic and practical training in advanced materials science, they will have opportunities for international travel and

collaborations, and there will be various other opportunities for personal development. As one example, MacDiarmid Institute's CRISP programme provides vocational training to enable a smooth transition into an exciting career in science.

The tax-free stipend is $35,000 NZD per year for three years and all tuition fees will be covered. Applications will be reviewed on an ongoing basis, with a deadline of 1 July 2022 and with the aim of commencing the project later in 2022. Applications should include a CV, academic transcripts, and a brief (1 page max) statement of research experience. Applicants should demonstrate that they fulfil the University of Auckland's English language requirements and should provide the names of at least two people who can provide personal letters of reference.

For further information and to apply, please contact:

Geoff Willmott (g.willmott@auckland.ac.nz)
Associate Professor, The Departments of Physics and Chemistry, The University of Auckland
Deputy Director, Commercialization and Industry Engagement, The MacDiarmid Institute for Advanced Materials and Nanotechnology