

FiNZ 2021 Programme

Day 1: Wednesday 27 January

10:30 Registration, Engineering Core

11:00 Welcome, Lecture Theatre E5

Session 1: Biology & Microfluidics (chair: James Hewett)

11:15 Invited Speaker: Tracie Barber – *The fluid dynamics of arterio-venous fistulae for dialysis*

12:00 Sevgi Onal – *Mechanical cell stimulation and compression in a microfluidic device*

12:15 Yifei Ma and Jeffrey J. Wise – *Microfluidic systems for machine learning*

12:30 Lunch

Session 2: Non-Newtonian & Microfluidics (chair: Richard Clarke)

13:30 Samuel K. Irvine – *Granular flow in a two opening silo: extending the $\mu(I)$ model*

13:45 Megan Danczyk – *Numerical modelling of smooth sphere collisions in the pendular regime validated with experimental results*

14:00 Santhosh Kumar Pandian – *Non-Newtonian drop impacts: spread and retraction analysis on micropillars*

14:15 Miguel Moyers-Gonzalez – *To flow or not to flow: the Bingham (fluid) prerogative*

14:30 Sina Safaei – *Instability of slip-asymmetric Janus aggregates in shear flows: a molecular dynamics study*

14:45 Debolina Sarkar – *Can we prevent kauri dieback through the modification of electric fields in natural environment?*

15:00 Afternoon tea

Session 3: Multiphase (chair: Miguel Moyers Gonzalez)

15:30 Ayoub Abdollahi – *Impact of heated dairy droplets on surfaces*

15:45 Emilia Nowak – *Kinetics of polymerisation reaction of alginate gels*

16:00 Kirill Misiuk – *Development of coating-free super water-repellent micropatterned aluminium for spontaneous droplet motion*

16:15 Andrew J. L. Lange – *Modelling bubble growth in a burning metal droplet*

16:30 Ross G. Shepherd – *Optimal control of spin coating on a spherical substrate*

16:45 Mathieu Sellier – *Thin liquid film dynamics on a spinning ellipsoid*

17:00 Staff club drinks

Day 2: Thursday 28 January

Session 4: Earth Science I (chair: Mathieu Sellier)

- 09:00 Invited Speaker: Rosalind Archer – *Coupled models in geothermal energy – multiphysics and multiprocess models*
- 09:45 Elizabeth K. McGeorge – *Recovery of bedrock topography in ice flows: an exploration using optimisation methods*
- 10:00 Craig D. McConnochie – *Aspect ratio affects iceberg melting*
- 10:15 Matthew Hayward – *Numerically modelling waves of explosive origin with application on submarine volcanism*
- 10:30 Morning tea

Session 5: Earth Science II (chair: Sam Lowrey)

- 11:00 Kunal K. Dayal – *Mesoscale wind resource mapping of the small island developing state (SIDS) of Fiji*
- 11:15 Michael MacDonald – *DNS of the moist stably stratified surface layer: turbulence and fog formation*
- 11:30 Pouria Aghajannezhad – *The effects of surface roughness on the flow in discrete fracture networks*
- 11:45 Sid Becker – *Low-resolution magnetic resonance velocimetry to measure velocity in porous media*
- 12:00 Poster session
- 12:30 Lunch

Session 6: Hydrodynamics (chair: Phil Wilson)

- 13:30 Invited Speaker: Callum Shakespeare – *The world of waves beneath the sea: how internal waves influence the global ocean and climate system*
- 14:15 Shuen Law – *Large eddy simulation of desalination discharges*
- 14:30 Michael J. Coe – *Investigation of scaling laws for underwater locomotion and propulsion efficiency*
- 14:45 Raghu Ande – *Investigation on fluid properties of small, medium and large array size of beams oscillating in fluids*
- 15:00 Afternoon tea

Session 7: Aerodynamics (chair: John Cater)

- 15:30 Theresa Bischof – *The effect of vane parameters on buoyancy vortices*
- 15:45 Warit Chanprasert – *Impact of wake meandering and turbulence on offshore wind turbines under different inflow conditions*
- 16:00 Duc Nguyen – *Using CFD to examine the sensitivity of incident wind directions on flow dynamics through constructed coastal dune notches*
- 16:15 Illia Chyrva – *Experimental investigation of upward velocity region between adjacent counter-rotating rotors using SPIV technique*
- 16:30 Michael J. Kingan – *Noise from large and small propellers*

16:45 James R. Ramsay – *Designing porous skins to reduce drag on bluff bodies*

17:00 Break

18:00 Dinner

Day 3: Friday 29 January

Session 8: Industry & Combustion (chair: Alan Caughley)

09:00 Invited Speaker: Sam Hamilton – *Using CFD and parametric CAD to design a new generation of reverse ducts for waterjet propulsion*

Invited Speaker: Curtis Marsh – *Industrial CFD applications*

09:45 Tao Cai – *Enhancing thermal performance by implementing a bluff-body in a hydrogen-fueled power system*

10:00 Siliang Ni – *Mitigation of NO_x emission and energy conversion efficiency improvement study of ammonia powered micro-combustor with ring-shaped ribs in fuel-rich combustion*

10:15 Yuze Sun – *Effect of N₂ dilution on thermal performance and emission characteristics of an ammonia-oxygen micro-thermophotovoltaic system*

10:30 Morning tea

Session 9: Heat Transfer (chair: Sid Becker)

11:00 Gideon J. Gouws – *Evolution of substrate temperature and drop morphology during the evaporation of sessile milk drops*

11:15 Chris Hughes – *3D-printed anisotropic microchannels for improved water management in heat exchangers*

11:30 Diana Kommedal – *Analysis of the effect of infiltration in heat load calculations of a retrofitted office building in Christchurch – New Zealand*

11:45 Salma Radwan – *Empirical heat transfer correlation for expansion pulsed pressure mass transport regime*

12:00 James N. Hewett – *Natural shapes of melting ice blocks*

12:15 Closing

12:20 Annual meeting

Posters

Maryam Abdali – *Designing a PCM-based battery cooling system for an electric racing vehicle*

Ekaterina Lieshout – *Sit ski aerodynamics*

Sam Lowrey – *Experimental investigation of condensation on superhydrophobic surface tension gradients*

Kirill Misiuk – *Surface wetting phenomena on combined micro-milled and ion-beam processed aluminium*

William Power – *Seiche effects in Lake Tekapo in an Mw8.2 Alpine Fault earthquake*

Oscar Punch – *Collision dynamics of wetted roughened particles*

James Robinson – *The non-local $\phi(I)$ response*

Frederick Steven Wells – *Stretch, splash, spike: ferrofluid drop impacts in non-uniform fields*

Venue

Talks are inside Lecture Theatre E5 within the Engineering Core, and posters outside the theatre. The Staff Club is at the Ilam Homestead, a ten minute walk from the Engineering Core. The Curators House is at 7 Rolleston Avenue, Christchurch.

