**IMI-La Trobe Joint Conference**

# Mathematics for Materials Science and Processing

Date: February 15 (Mon) – 17 (Wed), 2016

Venue: Institute for Advanced Study - Seminar Hall
La Trobe University, Melbourne Australia
http://www.latrobe.edu.au/

**February 15th (Mon)**

09:00-09:30 Conference Registration

09:30-09:45 Welcome to Conference

09:45-10:30 Graeme Wake (Massey University)
Fires in stored materials - assessment of risk

10:30-11:00 Morning Tea

11:00-11:45 Annette L. Worthy (University of Wollongong)
Various studies to generate and control solitons in nematic liquid crystals

11:45-12:30 Tony Guttmann (The University of Melbourne / ARC Centre of Excellence for Mathematics and Statistics of Complex Systems, MASCOS)
Polymers pulled from, and pushed towards, a walls

12:30-13:45 Lunch

13:45-14:30 David Boger (The University of Melbourne)
From Boger fluids to environmental rheology

14:30-15:15 Yasuhide Fukumoto (Kyushu University)
Topological idea combined with asymptotic expansions for vortex motion

15:15-15:45 Afternoon Tea

15:45-17:00 Student Poster Presentations

**February 16th (Tue)**

09:00-09:45 Bob Anderssen (CSIRO)
Food rheology: wheat grain hardness and wheat flour dough

09:45-10:45 Trina Dreher (Suez Oil & Gas Systems)
Electrostatic desalter optimization

Veronique Bonnelye (Suez Water & Treatment Solutions)
Water - new challenges

10:45-11:15 Morning Tea

11:15-12:00 Mark Nelson (University of Wollongong)
The biological treatment of wastewater

12:00-12:45 Bronwyn Hajek（University of South Australia）
Electrokinetic behaviour of concentrated colloidal suspensions

12:45-17:00 Lunch and Excursion

**February 17th (Wed)**

09:00-09:45 Shaun Hendy（University of Auckland)
Modelling micro and nanostructured surfaces

09:45-10:30 Keisuke Matsuya (Musashino University)
Spatial pattern of discrete and ultradiscrete Gray-Scott model

10:30-11:00 Morning Tea

11:00-11:45 Daisuke Tagami (Kyushu Univesity)
Finite element analysis of viscoelastic flow problems with application incorporating the Oldroyd-B model

11:45-12:30 Philip Broadbridge (La Trobe University)
Continuum modelling of grain boundary evolution on metal surfaces

12:30-13:30 Lunch

13:30-14:15 John E. Sader (The University of Melbourne)
Viscoelastic Flows Generated by Vibrating Nanoscale Structures in Simple Liquids

14:15-15:00 Aleksandar Staykov (Kyushu University)
Application of the non Eequilibrium Green's function method in the design of nanoelectronic devices

15:00-15:15 Conference Closing Remarks

| | Monday 15th February | Tuesday 16th February | Wednesday 17th February | |
|---|---|---|---|---|
| 9:00 am | Conference Registration | **Bob Anderssen**<br>Food rheology: wheat grain hardness and wheat flour dough | **Shaun Hendy**<br>Modelling micro and nanostructured surfaces | 9:00 am |
| 9:15 am | | | | 9:15 am |
| 9:30 am | Welcome to Conference | | | 9:30 am |
| 9:45 am | **Graeme Wake**<br>Fires in stored materials - assessment of risk | **Trina Dreher**<br>Electrostatic desalter optimisation<br><br>**Veronique Bonnelye**<br>Water - new challenges | **Keisuke Matsuya**<br>Spatial pattern of discrete and ultradiscrete Gray-Scott model | 9:45 am |
| 10:00 am | | | | 10:00 am |
| 10:15 am | | | | 10:15 am |
| 10:30 am | Morning Tea | | Morning Tea | 10:30 am |
| 10:45 am | | Morning Tea | | 10:45 am |
| 11:00 am | **Annette Worthy**<br>Various studies to generate and control solitons in nematic liquid crystals | | **Daisuke Tagami**<br>Finite element analysis of viscoelastic flow problems with application incorporating the Oldroyd-B model | 11:00 am |
| 11:15 am | | **Mark Nelson**<br>The biological treatment of wastewater | | 11:15 am |
| 11:30 am | | | | 11:30 am |
| 11:45 am | **Tony Guttmann**<br>Polymers pulled from, and pushed towards, a wall | | **Philip Broadbridge**<br>Continuum modelling of grain boundary evolution on metal surfaces | 11:45 am |
| 12:00 pm | | **Bronwyn Hajek**<br>Electrokinetic behaviour of concentrated colloidal suspensions | | 12:00 pm |
| 12:15 pm | | | | 12:15 pm |
| 12:30 pm | Lunch (included in registration) | | Lunch (included in registration) | 12:30 pm |
| 12:45 pm | | Boxed lunch (included in registration) | | 12:45 pm |
| 1:00 pm | | Excursion - Bus leaves La Trobe for Healsville Sanctuary | | 1:00 pm |
| 1:15 pm | | | | 1:15 pm |
| 1:30 pm | | | **John Sader**<br>Viscoelastic flows generated by vibrating nanoscale structures in simple liquids | 1:30 pm |
| 1:45 pm | **David Boger**<br>From Boger fluids to environmental rheology | | | 1:45 pm |
| 2:00 pm | | | | 2:00 pm |
| 2:15 pm | | | **Aleksandar Staykov**<br>Application of the non-equilibrium Green's function method in the design of nanoelectronic devices | 2:15 pm |
| 2:30 pm | **Yasuhide Fukumoto**<br>Topological idea combined with asymptotic expansions for vortex motion | | | 2:30 pm |
| 2:45 pm | | | | 2:45 pm |
| 3:00 pm | | | Conference Closing Remarks | 3:00 pm |
| 3:15 pm | Afternoon Tea | | | 3:15 pm |
| 3:30 pm | | | | 3:30 pm |
| 3:45 pm | Student Poster Presentations | | | 3:45 pm |
| 4:00 pm | | | | 4:00 pm |
| 4:15 pm | | | | 4:15 pm |
| 4:30 pm | | | | 4:30 pm |
| 4:45 pm | | | | 4:45 pm |
| 5:00 pm | | Excursion - Bus leaves Sanctuary | | 5:00 pm |

**IMI-La Trobe Joint Conference "Mathematics for Materials Science and Processing"**

# POSTER SESSION

15:45-17:00, Feb.15(Mon), 2016

| No. | Presenter | Affiliation | Grade | Title |
|---|---|---|---|---|
| 1 | Ryoto Ozaki | Graduate school of Mathematics Kyushu University | M1 | Change-point model selection via AIC for ARCH model |
| 2 | Takayuki Kanemori | Graduate school of Mathematics Kyushu University | M1 | AIC for propensity score methods in covariance structure analysis |
| 3 | Yusuke Shimizu | Graduate school of Mathematics Kyushu University | D2 | Progressive estimation for diffusion parameter observed at high frequency |
| 4 | Yang Guo | Graduate school of Mathematics Kyushu University | M1 | Comparison of Babai's nearest planeand rounding algorithms in Laine-Lauter's key recovery attack for LWE |
| 5 | Tatsuya Yamaguchi | Graduate school of Mathematics Kyushu University | D1 | A non-Hebbian Learning Model for Periodic Activities with Synchronization of Phase Oscillators |
| 6 | Minsup Lee | Graduate school of Mathematics Kyushu University | M1 | A Criterion for Global Existence of Solutions to a Parabolic-Elliptic Keller-Segel System |
| 7 | Shoichi Eguchi | Graduate school of Mathematics Kyushu University | D1 | Bayesian model comparison for dependent generalized linear model |
| 8 | Uuganbayar Zunderiya | Graduate school of Mathematics Kyushu University | - | Generalized Hypergeometric systems |
| 9 | Yuki Miyachi | Graduate school of Mathematics Kyushu University | D1 | Mechanical analogue of a rotating flow of a stratified fluid confined in an obliquely tilted ellipsoid. |
| 10 | Fermín Franco-Medrano | Graduate school of Mathematics Kyushu University | D3 | Theoretical derivation of the gas entrainment rate coefficient of an atomizing liquid jet |
| 11 | Wang Kun | Graduate school of Mathematics Kyushu University | M1 | Solving Discrete Logarithm Problem over $\mathbb{F}\boldsymbol{p}\times$ Using Number Field Sieve |