The 81st Fujihara seminar
"Mathematical Aspects for Interfaces and Free Boundaries"

June 3 – June 6, 2024

Hilton Niseko Village, Hokkaido, Japan

All lectures will be held in the room "Annupuri" on the 3rd floor. ("Annupuri" is open until 22:00 Monday through Wednesday and until 21:00 on Thursday.)
Breakfast restaurant is "Melt" on the 2nd floor. Lunch and dinner will be served in the room "Higashiyama" on the 3rd floor, except for dinner on June 5 (Wednesday). Dinner on June 5 will be served at the restaurant "Sisam" on the 2nd floor. The photo session will take place outside the building.

(June 2, 2024: 19:00–21:00 Dinner)

Program

Monday, June 3, 2024

Breakfast

9:00–9:30   Opening presentation (Fujihara Foundation and Organizers)

9:30–10:15   Photo session and coffee break

10:15–10:35   **Charles M. Elliott** (University of Warwick) PDEs on evolving domains and evolving finite elements

10:45–11:05   **Marcel J. Rost** (Leiden University) Arrhenius follows Frumkin to describe atomic diffusion involved peaks in cyclic voltammograms: the reversible place-exchange on Pt(111)

11:15–11:30   Coffee break

11:30–11:50   **Michael Hinze** (University of Koblenz) Shape optimization with Lipschitz methods

12:00–12:20   **Masahiro Yamamoto** (The University of Tokyo) Uniqueness in inverse problem of determining shapes of sub-boundaries by nonstationary heat equations without initial conditions

12:30–12:45   Move for lunch after hand-washing

12:45–14:15   Lunch

15:15–15:45   Coffee and cookies

15:45–16:05   **Jeremy Louis Marzuola** (University of North Carolina at Chapel Hill) On 4th order nonlinear thin-film like PDEs describing crystal surface evolution

16:15–16:35   **Takayuki Nakamuro** (The University of Tokyo) Quantitative analysis around crystallization phenomena via molecular electron microscopy

16:45–17:15   Coffee break

17:15–17:35   **Tim Laux** (University of Regensburg) Stability of volume-preserving mean curvature flow & optimal convergence rates for the nonlocal Allen–Cahn equation

17:45–18:05   **Keisuke Takasao** (Kyoto University) On obstacle problem for Brakke's mean curvature flow with Neumann boundary condition

18:15–18:30   Move for dinner after hand-washing

18:30–20:00   Dinner

Tuesday, June 4, 2024

Breakfast

9:00–9:20   **Harald Garcke** (University of Regensburg) Parametric finite element approximation of two-phase Navier–Stokes flow with viscoelasticity

9:30–9:50   **Bjorn Stinner** (University of Warwick) Convergent finite element schemes with mesh smoothing for geometrically evolving curves and networks

10:00–10:20   **Koichi Sudoh** (Osaka University) Geometric model of nanoparticle-assisted nanopore formation on solid substrates

10:30–11:00   Coffee break

11:00–11:20   **Glen Wheeler** (University of Wollongong) A simple and effective PDE model for bushfires

11:30–11:50   **Michał Łasica** (Polish Academy of Sciences) Existence for a class of fourth-order quasilinear parabolic equations

12:00–12:20   **Hiroyoshi Mitake** (The University of Tokyo) On asymptotic growth rate of solutions to level-set forced mean curvature flows with evolving spirals

12:30–12:45   Move for lunch after hand-washing

12:45–14:15   Lunch

15:15–15:45   Coffee and cookies

15:45–16:05   **James A. Sethian** (University of California, Berkeley) Fluid interfaces and transport in industrial processes

16:15–16:35   **Hiroshi Watanabe** (Oita University) A constrained gradient system associated with 3D grain boundary motion

16:45–17:15   Coffee break

17:15–17:35   **Olivier Pierre-Louis** (CNRS, Claude Bernard Lyon 1 University, Institute of Light and Matter) Macroscopic avalanches in motion by curvature with many obstacles

17:45–18:05   **Koya Sakakibara** (Kanazawa University) Fractional time differential equation as a singular limit of the Kobayashi–Warren–Carter system

18:15–18:30   Move for dinner after hand-washing

18:30–20:00   Dinner

Wednesday, June 5, 2024

Breakfast

9:00–9:20   **Matthias Hieber** (Technical University of Darmstadt) Free boundary problems for viscous incompressible fluids via Da Prato–Grisvard theory

9:30–9:50   **Arnold Reusken** (RWTH Aachen University) On a new narrow band level set method

10:00–10:20   **Tatsu-Hiko Miura** (Hirosaki University) Error estimate for classical solutions to the heat equation in a moving thin domain and its limit equation

10:30–11:00   Coffee break

11:00–11:20   **John King** (University of Nottingham) Biological moving boundary problems

11:30–11:50   **Takeshi Ohtsuka** (Gunma University) A minimizing movement approach without using distance function for evolving spirals by crystalline curvature

12:00–12:20   **Shinya Okabe** (Tohoku University) Ideal curve flow with constraints on length

12:30–12:45   Move for lunch after hand-washing

12:45–14:15   Lunch

Free afternoon

17:45–18:00   Move for dinner after hand-washing

18:00–19:30   Dinner

20:00–21:00   Session for short communications

  Tokuhiro Eto (The University of Tokyo) Numerical computation for geometric evolution equations using deep learning

  Shodai Kubota (National Institute of Technology, Miyakonojo College) Numerical algorithms for optimal control problems governed by Kobayashi–Warren–Carter type systems

  Shuntaro Tsubouchi (The University of Tokyo) Gradient continuity for very singular equations with one-Laplacian

  Yuki Ueda (Hokkaido University) Numerical computation for 4th order total variation flow

Thursday, June 6, 2024

Breakfast

9:00–9:20   **Frédéric Flin** (National Centre for Meteorological Research) A snow isothermal metamorphism model applicable on microtomographic images

9:30–9:50   **Philip Herbert** (University of Sussex) A combined shape and topology optimisation using phase fields and the $W^{1,\infty}$ topology

10:00–10:20   **Masato Kimura** (Kanazawa University) Well-posedness of Hele–Shaw type moving boundary problem associated with gradient method for shape optimization

10:30–11:00   Coffee break

11:00–11:20   **Chandrasekhar Venkataraman** (University of Sussex) Moving boundary problems on moving cell boundaries

11:30–11:50   **Piotr Rybka** (University of Warsaw) Convergence of solutions of a one-phase Stefan problem with Neumann boundary data to a self-similar profile

12:00–12:20   **Masashi Mizuno** (Nihon University) Extension of the entropy dissipation method to inhomogeneous non-linear Fokker–Planck equations

12:30–12:45   Move for lunch after hand-washing

12:45–14:15   Lunch

15:15–15:45   Coffee and cookies

15:45–16:05   **Balázs Kovács** (Paderborn University) Numerical surgery for mean curvature flow of surfaces

16:15–16:35   **Tatsuya Miura** (Kyoto University) Migrating elastic flows

16:45–17:15   Coffee break

17:15–17:35   **Miyuki Koiso** (Kyushu University) A free boundary problem for anisotropic surface energy

17:45–18:05   **Chun Liu** (Illinois Institute of Technology) Active complex fluids

18:15–18:30   Move for dinner after hand-washing

18:30–20:00   Dinner

Organizers:
Charles M. Elliott (University of Warwick)
Yoshikazu Giga (The University of Tokyo)
Nao Hamamuki (Hokkaido University)
Michael Hinze (University of Koblenz)
Vanessa Styles (University of Sussex)
Etsuro Yokoyama (Gakushuin University)