

**MIMS Workshop on  
Modeling and Numerical Analysis of Nonlinear Phenomena:  
Fluid Dynamics, Motion of Interfaces, and Cell Biology**

Wednesday, December 6 — Friday, December 8, 2017  
Room 603, Nakano Campus, Meiji University, Tokyo, Japan  
<http://scheme.hn/mims2017/>

Supported by  
MIMS, Meiji University,  
A3 Foresight Program, and JST PRESTO.

Organizers:

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- \* *All lectures are given by invited speakers.*
- \* *Each lecture consists of 40 minutes talk and 10 minutes discussion.*

**Wednesday, December 6**

13:00 – 13:10 **Opening**

Session 1 (2 talks) Chair: H. Notsu

13:10 – 14:00 Mária Lukáčová-Medvid'ová (University of Mainz, Germany)  
*Energy stable linear schemes for viscoelastic phase separation*

14:00 – 14:50 Shuji Ishihara (The University of Tokyo, Japan)  
*Continuum model for epithelial tissue*

14:50 – 15:10 **Coffee break**

Session 2 (3 talks) Chair: X. Xu

15:10 – 16:00 Julien Dambrine (University of Poitiers, France)  
*Interface motion involving the Dirichlet-to-Neumann operator*

16:00 – 16:50 Hideru Togashi (Kobe University, Japan)  
*Cellular tessellation in sensory epithelia*

16:50 – 17:10 **Coffee break**

17:10 – 18:00 Amy Q. Shen (OIST-Okinawa Inst. Sci. Tech. Gr. Univ., Japan)  
*Elastic and inertial instabilities in microfluidic flows*

## Thursday, December 7

### Session 3 (3 talks) Chair: M. Lukáčová-Medvid'ová

09:30 – 10:20 Cassio M. Oishi (UNESP-Universidade Estadual Paulista, Brazil)  
*Computational simulation in complex flows of non-Newtonian fluids*

10:20 – 10:35 Coffee break

10:35 – 11:25 Yangjin Kim (Konkuk University, Korea)  
*Mathematical models of tumor invasion and OV/immune therapy*

11:25 – 11:40 Coffee break

11:40 – 12:30 Catherine Kublik (University of Dayton, USA)  
*Integration over implicitly defined interfaces and extension to unstructured point clouds*

12:30 – 14:00 Lunch break

### Session 4 (2 talks) Chair: J. Dambrine

14:00 – 14:50 Sungrim Seirin-Lee (Hiroshima University, Japan)  
*Pattern formation induced by a domain deformation: A mystery of remodeling process in nuclear architecture*

14:50 – 15:40 Makoto Sato (Kanazawa University, Japan)  
*Mathematical modeling and genetic analysis of fly visual system development*

15:40 – 16:00 Coffee break

### Session 5 (2 talks) Chair: H. Murakawa

16:00 – 16:50 Eliot Fried (OIST-Okinawa Inst. Sci. Tech. Gr. Univ., Japan)  
*Isogeometric phase-field analysis*

16:50 – 17:40 Danielle Hilhorst (Université de Paris-Sud / CNRS, France)  
*On a reaction-diffusion-ODE model for the neolithic dispersal of farmers and hunter-gatherers*

18:30 – 21:00 Dinner

## Friday, December 8

### Session 6 (3 talks) Chair: C. M. Oishi

09:30 – 10:20 Markus Schmidtchen (Imperial College London, UK)

*Convergence of splitting schemes and segregation in reaction-(cross-)diffusion systems*

10:20 – 10:35 Coffee break

10:35 – 11:25 Natsuhiko Yoshinaga (Tohoku University, Japan)

*Active soft materials: Self-propelled motion and its collective behaviours of colloids and liquid drops*

11:25 – 11:40 Coffee break

11:40 – 12:30 Xianmin Xu (Chinese Academy of Science, China)

*Modelling and computations for wetting on rough surfaces*

12:30 – 14:00 Lunch break

### Session 7 (2 talks) Chair: H. Notsu

14:00 – 14:50 Hirofumi Izuhara (Miyazaki University, Japan)

*Mathematical analysis on a nonlinear system for contact inhibition of cell growth*

14:50 – 15:40 Giulio G. Giusteri (OIST-Okinawa Inst. Sci. Tech. Gr. Univ., Japan)

*Rheometric and modeling frameworks for complex fluids*

15:40 – 16:00 Coffee break

### Session 8 (3 talks) Chair: K. Švadlenka

16:00 – 16:50 Yana Di (Chinese Academy of Science, China)

*Numerical methods for interfacial flows with surfactant*

16:50 – 17:15 Akihisa Yamamoto (iCeMS / Gr. Sch. Med., Kyoto Univ., Japan)

*Cancer progression alters morphological fluctuation and self-propelled motion of human gastric cells*

17:15 – 17:40 Ryo Suzuki (iCeMS / Gr. Sch. Med., Kyoto Univ., Japan)

*Active deformation and symmetry breaking in regenerating Hydra tissues*

17:40 – 17:50 Closing