

IMA6

6th Conference of the International Marangoni Association

Interfacial Fluid Dynamics and Processes

Technion – Israel Institute of Technology

June 18-21 Haifa Israel

Technical Program



משרד המדע והטכנולוגיה
Ministry of Science & Technology
وزارة العلوم والتكنولوجيا



TEL AVIV UNIVERSITY  אוניברסיטת תל-אביב

Reception and Registration Sunday 17/6 18:00-21:30

Monday 18/6 8:30-9:00 Registration and Coffee

Opening Session 9:00 -9:20 Chair: A. Oron

Session M1: Monday 18/6 9:30-10:30 Chair: R. Narayanan

9:30-9:45 R. Borcia and M. Bestehorn "Contact line dynamics, Marangoni flows and associated effects"

9:45-10:00 I. D. Borcia, R. Borcia, M. Bestehorn, C. Borcia, N. Dumitrascu "Contact lines in different geometries"

10:00-10:15 H. Riegler and S. Karpitschka "Marangoni effect from chemical gradients near contact lines"

10:15-10:30 S. Karpitschka and H. Riegler "Marangoni modified drop fusion and drop motion: thin film traveling wave description by asymptotic matching"

Session P1: Monday 18/6 10:30-11:00 Chair: A. Viviani

Short poster presentation (3 minutes each)

V.M. Starov and N. Ivanova "Surfactant-induced spreading of aqueous droplets over polymer substrates"

T. Lemee, R. Narayanan and G. Labrosse "Thermocapillarity instabilities in a free liquid film"

Y.-R. Li, L. Peng, and W.-Y. Shi "Flow pattern transition of thermocapillary convection in a differentially heated annular pool for moderate Prandtl number fluid under varying gravity level"

C. Hsueh, F. Doumenc and B. Guerrier "Evaporation of complex fluids in a Hele-Shaw cell"

L. Peng, L.-M. Zhou, Y.-R. Li and W.-Y. Shi "Global simulation of detached solidification under cusp magnetic field"

A. Ovcharova and N. Stankous "Influence of thermophysical properties of liquid on features of the rupture of film. The role of the Prandtl number"

A. Lobasov, A. Minakov and V. Rudyak "Investigation of wall slipping influence on mixing efficiency and pressure drop in T-shaped microchannel at high Reynolds numbers"

V. Shevtsova, Y. Gaponenko, A. Nepomnyashchy "Oscillatory instability of thermocapillary flow caused by gas stream along the interface"

T. Lyubimova and R. Skuridin "The influence of high-frequency vibrations on the stability of thermocapillary flow in the liquid zone"

K. Kanatani "Stability of a condensing liquid film of a binary vapor mixture"

Poster Session P1 and Coffee Break 11:00-11:45

Session M2: Monday 18/6 11:45-13:15 Chair: V. Pukhnachev

- 11:45-12:00 S. Semenov, V. M. Starov and R. G. Rubio "Evaporation of pinned sessile microdroplets of water: computer simulations"
- 12:00-12:15 F. Doumenc and B. Guerrier "Numerical simulation of an evaporative meniscus on a moving substrate"
- 12:15-12:30 F. Doumenc, E. Ch'enier, B. Trouette, and T. Boeck "Thermal and solutal Rayleigh-Benard- Marangoni convection induced by solvent evaporation in polymer solutions"
- 12:30-12:45 O. Goncharova and E. Rezanova "Mathematical modeling of the evaporating liquid films on the basis of the generalized interface conditions"
- 12:45-13:00 S. G. Yiantsios "Aspects of thermo-capillary and soluto-capillary instabilities in evaporating thin films"
- 13:00-13:15 A. Rednikov, H. Machrafi, P. C. Dauby and P. Colinet " Extremely unstable evaporative Benard-Marangoni systems: the role of transients in the gas"

Lunch 13:15-14:30

Session M3: Monday 18/6 14:30-16:00 Chair: G. P. Neitzel

- 14:30-14:45 A. B. Mikishev and A. A. Nepomnyashchy "Marangoni instability of a liquid layer with insoluble surfactant under heat flux modulation"
- 14:45-15:00 O. Haimovich and A. Oron "Nonlinear dynamics of a thin liquid film on an axially oscillating cylindrical surface subjected to double-frequency forcing"
- 15:00-15:15 M. Bestehorn and A. Oron "Thin film behavior under external vibrations"
- 15:15-15:30 I. Wertgeim, M. Kumachkov, and A. Mikishev "Parametrically excited Marangoni convection in a locally heated liquid layer"
- 15:30-15:45 D. Lyubimov and T. Lyubimova. "Long wave Rayleigh-Benard-Marangoni instability of a fluid layer with deformable free surface"

Poster Session P1 and Coffee Break 15:45-16:30

Session M4: Monday 18/6 16:30-17:45 Chair: M. Bestehorn

- 16:30-16:45 T. Pollak, C. Heining, and N. Aksel "Pattern formation and mixing in three-dimensional film flow"
- 16:45-17:00 D. Melnikov, D. Pushkin, and V. Shevtsova "Coherent accumulation structures formed by small inertial particles in periodic flows"
- 17:00-17:15 H. C. Kuhlmann, F. H. Muldoon, and R. Mukin "On the different manifestations of particle accumulation structures (PAS) in thermocapillary flows"
- 17:15-17:30 A. Povitsky and S. Zhao "Hybrid continuum-molecular modeling of filtration flows in the transition flow regime"
- 17:30-17:45 K. Schwarzenberger, K. Eckert, and H. Linde "On the transitions from cellular into wave-like patterns during the mass transfer of weakly surface-active substances in liquid-liquid systems"

Session T1: Tuesday 19/6 9:00-10:45 Chair: A. Nepomnyashchy

- 9:00-9:15 W. Batson, F. Zoueshtiagh and R. Narayanan "Faraday wave dynamics of immiscible systems in finite cells"
- 9:15-9:30 O. Gottlieb, G. Habib, Z. Aginsky, and L. Ioffe "Model-based estimation of nonlinear dissipation mechanisms in free and modulated surface flows"
- 9:30-9:45 S. Duruk and A. Oron "Nonlinear dynamics of a liquid film on an axially oscillating cylindrical surface in the high-frequency limit"
- 9:45-10:00 A. Alexeev, W. Mao and A. Oron "Thermocapillary pumping by periodical heating"
- 10:00-10:15 Q.-S. Liu and Z. Ding "Oscillatory instability of thermocapillary convection in a bilayer liquid system"
- 10:15-10:30 A. A. Alabuzhev and M. Khennner "Large parametric instability of a Marangoni convection in a thin film"
- 10:30-10:45 A. Ye. Samoilova and N. I. Lobov "The buoyancy effect on oscillatory Marangoni instability in liquid layer"

Session P2: Tuesday 19/6 10:45-11:15 Chair: Q.-S. Liu

Short poster presentation (3 minutes each)

- D. Laroze, J. Martinez-Mardones, H. Pleiner "Benard-Marangoni instability in a viscoelastic magnetic fluid"
- S. Vasin, A. Filippov and E. Sherysheva "Movement of composite microcapsules in a viscous liquid"
- N. J. Alvarez and K. Uguz "Thermocapillary instability of three immiscible phases flowing through a channel"
- N. J. Alvarez, C. Jeppesen, K. Yvind, N. A. Mortensen, I. Teraoka and O. Hassager "The continuous separation of molecules on the basis of their polarizability using optical electric fields"
- K. E. Uguz and R. Narayanan "Instability in the presence of evaporation for binary liquids"
- K. Eckert and K. Schwarzenberger "On the interaction between Marangoni cells and double diffusive fingers in a reactive liquid-liquid system"
- W. Batson, F. Zoueshtiagh and R. Narayanan "Faraday wave dynamics of immiscible systems in finite cells"
- A. Nurocak and A. K. Uguz "Effect of the direction of the electric field on the interfacial instability between a Newtonian fluid and a viscoelastic polymer"
- M. Sellier "Droplet actuation induced by coalescence: experiments and modeling"
- T. Lyubimova and M. Alabuzheva "The influence of thermocapillary effect on the stability of fluid interface subjected to the horizontal vibrations"
- Z. Ding, R. Liu and Q.S. Liu "Stability of an evaporating falling film"

Poster Session P2 and Coffee Break 11:15-12:00

Session T2: Tuesday 19/6 12:00-13:00 Chair: H. C. Kuhlmann

- 12:00-12:15 M. Muraoka, T. Kamiyama, T. Wada, I. Ueno and H. Mizoguchi "Creeping motion and coalescence of droplets in a tube flow"
- 12:15-12:30 G. P. Neitzel and J. Black "Thermocapillary levitation of nanoliter-volume single- and compound-phase droplets"
- 12:30-12:45 M. Sellier "Droplet actuation induced by coalescence: experiments and modeling"
- 12:45-13:00 Y. Holenberg, U. Shavit, O. Lavrenteva and A. Nir "Translation of droplets in viscoplastic fluids"

Lunch 13:00-14:15

Session T3: Tuesday 19/6 14:15-15:45 Chair: A. Nir

- 14:15-14:30 A. Nurocak and A. K. Uguz "Effect of the direction of the electric field on the interfacial instability between a Newtonian fluid and a viscoelastic polymer"
- 14:30-14:45 W. Rohlf, G. F. Dietze, H. D. Haustein and R. Kneer "Experimental investigation of 3-dimensional wavy liquid films under the coupled influence of thermo-capillary and electrostatic forces"
- 14:45-15:00 N. J. Alvarez, C. Jeppesen, K. Yvind, N. A. Mortensen, I. Teraoka and O. Hassager "The continuous separation of molecules on the basis of their polarizability using optical electric fields"
- 15:00-15:15 K. Shvarts, J. Shvarts and N. Knutova "Effect of the influence of slow rotation to stability of thermocapillary incompressible liquid flow in infinite layer in microgravity situation"
- 15:15-15:30 W.-Y. Shi, J. Li, M. K. Ermakov and Y.-R. Li "Effect of system rotation on thermocapillary convection and stability of silicon melt in differential heated annular pools"
- 15:30-15:45 K. E. Davis, Y. Huang and B. C. Houchens "Investigation of instabilities in a thermocapillary-driven, low Prandtl number liquid bridge with magnetic stabilization using three-dimensional simulations and linear stability theory"

Poster Session P2 and Coffee Break 15:45-16:30

Session T4: Tuesday 19/6 16:30-18:00 Chair: L. Pismen

- 16:30-16:45 R. Liu, Q.-S. Liu and O. Kabov "Effect of interfacial shear on the longwave Marangoni instability in a locally heated falling film"
- 16:45-17:00 P. H. Gaskell, D Slade, S Veremieiev and Y.-C. Lee "Thin film flow: rivulet formation, evolution and merger"
- 17:00-17:15 H. Haustein, G. Tebrugge, W. Rohlf, and R. Kneer "Preliminary results of the influence of thermo-capillary forces on two-dimensional wavy falling films of water"
- 17:15-17:30 S. Shklyaev, A. A. Nepomnyashchy and A. Oron "Modulation instability for a longwave oscillatory Marangoni convection"
- 17:30-17:45 T. Lemeec, R. Narayanan and G. Labrosse "Thermocapillary instabilities in a free liquid film"
- 17:45-18:00 Y. Gaponenko, T. Matsunaga and V. Shevtsova "Dynamic interface deformation under the actions of Marangoni convection and coaxial gas stream"

Wednesday 20/6 Day trip to and banquet in Jerusalem

Session Th1: Thursday 21/6 9:15-10:00 Chair: H. Riegler

- 9:15-9:30 S. Matsumoto, S. Yoda, A. Komiya, M. Kawaji and N. Imaishi "Onset of oscillatory thermocapillary convection in liquid bridge with various Pr numbers"
- 9:30-9:45 T. Yano, K. Nishino, H. Kawamura, I. Ueno and S. Matsumoto "Flow and temperature field associated with hydrothermal wave of Marangoni convection in liquid bridge under microgravity"
- 9:45-10:00 I. Ueno, F. Sato, H. Kawamura, K. Nishino, S. Matsumoto, M. Ohnishi and M. Sakurai, "Hydrothermal wave instability in $\Gamma \geq 2.0$ liquid bridge of high Prandtl number fluid"

Poster Session P3 and Coffee Break 10:00-11:00

Session Th2: Thursday 21/6 11:00-12:00 Chair: K. Nishino

- 11:00-11:15 I. Frankel and R. Shabtay "The internal fluid motion within highly viscous adherent droplets"
- 11:15-11:30 J. J. Feng "Moving contact lines: diffuse-interface model and applications"
- 11:30-11:45 M. Zabaranin, I. Smagin, O. Lavrenteva and A. Nir "Deformation of a viscous drop in compressional Stokes flow"
- 11:45-12:00 E. Katz, A. M. Leshansky, M. Haj, and A. Nepomnyashchy "Thermocapillary motion of a slender viscous droplet in a channel"

Presentation for IMA7 12:00-12:15

Lunch 12:15-14:00

Session Th3: Thursday 21/6 14:00-15:30 Chair: V. Shevtsova

- 14:00-14:15 O. A. Frolovskaya and A. A. Nepomnyashchy "Influence of density stratification on stability of a two-layer binary-fluid system with a diffuse interface"
- 14:15-14:30 S. Madruga, F. Bribesh and U. Thiele "Decomposition and interface evolution in films of binary mixtures"
- 14:30-14:45 K. Kanatani "Stability of a condensing liquid film of a binary vapor mixture"
- 14:45-15:00 M. Morozov, A. Oron and A. Nepomnyashchy "Marangoni convection in binary fluids with soluble surfactant"
- 15:00-15:15 O. V. Admaev, V. V. Pukhnachev and O. A. Frolovskaya "Cahn-Hilliard equation and anomalous Marangoni effect"
- 15:15-15:30 M. H. Kopf, S. V. Gurevich, and R. Friedrich "Micro- and nanoscale pattern formation in Langmuir-Blodgett transfer: Control mechanisms and bifurcation analysis"

Coffee Break 15:30-16:00

Session Th4: Thursday 21/6 16:00-16:45 Chair: V. Starov

- 16:00-16:15 A. Mizev, A. Trofimenko and A. Viviani "Instability of Marangoni flow in the presence of insoluble surfactant. Experiment"
- 16:15-16:30 K. G. Kostarev, M. O. Denisova, A.V. Shmyrov and A. Viviani "Surfactant transfer enhancement between the drop connected to the reservoir and the surrounding fluid due to Marangoni convection"
- 16:30-16:45 T. Horn, T. Gambaryan-Roisman and P. Stephan "Marangoni convection in liquid films on heated structured walls at normal and reduced gravity"

IMA6 Closing 16:45 Chair: A. Oron