
Oscillations & Dynamic Instabilities in Chemical Systems

July 15-20, 2012
Colby College
Waterville, ME

Chair: Tomohiko Yamaguchi
Vice Chair: Dezső Horváth

Contributors



John A. Pojman



SUNDAY

- 2:00 pm - 9:00 pm Arrival and Check-in (Office Closed 6:00 pm - 7:00 pm)
- 6:00 pm Dinner
- 7:30 pm - 7:40 pm Welcome / Introductory Comments by GRC Site Staff
- 7:40 pm - 9:30 pm **Oscillations, Patterns and Instabilities: Past 30 Years and Future**
- 7:40 pm - 7:50 pm Discussion Leader: **Stephen Scott** (University of Leeds)
- 7:50 pm - 8:30 pm **Patrick De Kepper** (Centre de Recherche Paul Pascal, University of Bordeaux)
"Turing and Other Reaction-Diffusion Patterns in Solution Chemistry: Early Observations and Recent Designed Advances"
- 8:30 pm - 8:40 pm Discussion
- 8:40 pm - 9:20 pm **Kenichi Yoshikawa** (Kyoto University)
"How to Bridge Life and Matter Through Nonlinear Dynamics?"
- 9:20 pm - 9:30 pm Discussion

MONDAY

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **From the BZ Reaction to Present Chemical Oscillators**

9:00 am - 9:10 am Discussion Leader: **Richard J. Field** (University of Montana)

9:10 am - 9:50 am **Markus Hauser** (Otto-von-Guericke-Universität Magdeburg)
"3D Pattern Dynamics in the BZR"

9:50 am - 10:05 am Discussion

10:05 am - 10:40 am Group Photo / Coffee Break

10:40 am - 11:20 am **Irving Epstein** (Brandeis University)
"Searching for a Chemical Computer: BZ-microdroplets, Pulse-coupled Oscillators, Fuzzy-logic, 3D RD Patterns"

11:20 am - 11:35 am Discussion

11:35 am - 12:15 pm **Miklós Orbán** (Eötvös University)
"The pH-Oscillators: Their Variety and Applications"

12:15 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session I

6:00 pm Dinner

7:30 pm - 9:30 pm **Recent Highlights I**

Discussion Leader: **Takashi Amemiya** (Yokohama National University)

7:30 pm - 8:00 pm **Shigeru Kondo** (Osaka University)
"Turing Pattern without Diffusion"

8:00 pm - 8:15 pm Discussion

8:15 pm - 8:25 pm **Yannick De Decker** (Université Libre de Bruxelles)
"Reconstruction of Dynamical Systems from Nanoscale Experiments"

8:25 pm - 8:30 pm Discussion

8:30 pm - 8:40 pm **Jerzy Górecki** (Polish Academy of Science)
"Information Processing in a Medium Composed of Belousov-Zhabotinsky Droplets"

8:40 pm - 8:45 pm Discussion

8:45 pm - 8:55 pm **Mark Tinsley** (West Virginia University)
"Chimera and Phase Cluster States in Populations of Coupled Chemical Oscillators"

8:55 pm - 9:00 pm Discussion

9:00 pm - 9:10 pm **Jichang Wang** (University of Windsor)
"Complex Reaction Behavior and Great Photosensitivity in the Cerium-Bromate-Benzoquinone Reaction"

9:10 pm - 9:15 pm Discussion

9:15 pm - 9:25 pm **Glen Frerichs** (Westminster College)
"Batch pH Oscillations in Well-Known Chemical Oscillators"

9:25 pm - 9:30 pm Discussion

TUESDAY

- 7:30 am - 8:30 am Breakfast
- 9:00 am - 12:30 pm **Nonlinear Phenomena in Materials Science**
- 9:00 am - 9:10 am Discussion Leader: **John A. Pojman** (Louisiana State University)
- 9:10 am - 9:50 am **Qui Tran-Cong Miyata** (Kyoto Institute of Technology)
"Reaction-Diffusion Phenomena Driven by Polymerization in Ternary Polymer Mixtures"
- 9:50 am - 10:05 am Discussion
- 10:05 am - 10:40 am Coffee Break
- 10:40 am - 11:20 am **Anna C. Balazs** (University of Pittsburgh)
"Computational Modeling of Soft, Active Materials"
- 11:20 am - 11:35 am Discussion
- 11:35 am - 12:15 pm **Ryo Yoshida** (The University of Tokyo)
"Self-Oscillating Polymer Gels as Smart Materials: From Linear Polymer to Bulk Gel"
- 12:15 pm - 12:30 pm Discussion
- 12:30 pm Lunch
- 1:30 pm - 4:00 pm Free Time
- 4:00 pm - 6:00 pm Poster Session II
- 6:00 pm Dinner
- 7:30 pm - 9:30 pm **Entropy Production in Nonequilibrium Systems**
- 7:30 pm - 7:40 pm Discussion Leader: **Dilip Kondepudi** (Wake Forest University)
- 7:40 pm - 8:20 pm **Gregoire Nicolis** (Université Libre de Bruxelles)
"The Many Facets of Entropy Production"
- 8:20 pm - 8:35 pm Discussion
- 8:35 pm - 9:15 pm **Stefan C. Müller** (Otto-von-Guericke-Universität Magdeburg)
"On the Proposed Extremum Principles of Entropy Production"
- 9:15 pm - 9:30 pm Discussion

WEDNESDAY

- 7:30 am - 8:30 am Breakfast
- 9:00 am - 12:30 pm **Instabilities at Dissipative Interfaces**
- 9:00 am - 9:10 am Discussion Leader: **Anne De Wit** (Université Libre de Bruxelles)
- 9:10 am - 9:50 am **Oliver Steinbock** (Florida State University)
"Nonequilibrium Materials Synthesis: Reactive Interfaces and Macroscopic Structures"
- 9:50 am - 10:05 am Discussion
- 10:05 am - 10:40 am Coffee Break
- 10:40 am - 11:20 am **Véronique Pimienta** (University Paul Sabatier)
"Shapes and Motion of an Oil Drop on a Surfactant Solution"
- 11:20 am - 11:35 am Discussion

- 11:35 am - 12:15 pm **Satoshi Nakata** (Hiroshima University)
"Mode-switching of an Autonomous Motor"
- 12:15 pm - 12:30 pm Discussion
- 12:30 pm Lunch
- 1:30 pm - 4:00 pm Free Time
- 4:00 pm - 6:00 pm Poster Session III
- 6:00 pm Dinner
- 7:00 pm - 7:30 pm Business Meeting
Nominations for the next Vice Chair; Fill out Conference Evaluation Forms; Discuss future Site & Scheduling preferences; Election of the next Vice Chair
- 7:30 pm - 9:30 pm **Recent Highlights II**
Discussion Leader: **Vilmos Gáspár** (University of Debrecen)
- 7:30 pm - 7:40 pm **Nobuhiko Suematsu** (Meiji University)
"Localized Bioconvection of Photosynthetic Microorganisms"
- 7:40 pm - 7:45 pm Discussion
- 7:45 pm - 7:55 pm **Laurence Rongy** (Université Libre de Bruxelles)
"A + B -> C Reaction Fronts Propagating in Hele-Shaw Cells under Modulated Gravitational Acceleration"
- 7:55 pm - 8:00 pm Discussion
- 8:00 pm - 8:10 pm **Patrick Bunton** (William Jewell College)
"Molecular-probe Fluorescence Monitoring of Local Viscosity in a Hele-Shaw Cell"
- 8:10 pm - 8:15 pm Discussion
- 8:15 pm - 8:25 pm **Sergey Semenov** (Radboud University of Nijmegen)
"The role of ultrasensitivity in signal propagation of enzymatic reactions: an *in-vitro* model system"
- 8:25 pm - 8:30 pm Discussion
- 8:30 pm - 8:40 pm **Csaba Bagyinka** (Institute of Biophysics, Biological Research Centre)
"How Does the Hydrogenase Enzyme Work"
- 8:40 pm - 8:45 pm Discussion
- 8:45 pm - 8:55 pm **Nathaniel Wagner** (Ben-Gurion University of the Negev)
"Dynamical Behavior of Reversible Catalytic Networks"
- 8:55 pm - 9:00 pm Discussion
- 9:00 pm - 9:10 pm **Michael Aizenberg** (Harvard University)
"Autonomic Dynamic Materials Displaying Chemo-mechano-chemical Self-regulation"
- 9:10 pm - 9:15 pm Discussion
- 9:15 pm - 9:25 pm **Alberto Perez Muñozuri** (Univ. de Santiago de Compostela)
"Robotics Algorithms Based in Biological Waves"
- 9:25 pm - 9:30 pm Discussion

THURSDAY

- 7:30 am - 8:30 am Breakfast
- 9:00 am - 12:30 pm **Nonlinear Dynamics in Chemical Communication**
- 9:00 am - 9:10 am Discussion Leader: **Raymond Kapral** (University of Toronto)
- 9:10 am - 9:50 am **Anette Taylor** (University of Leeds)
"Collective Behaviour of Autocatalytic Micro-Particles"
- 9:50 am - 10:05 am Discussion
- 10:05 am - 10:40 am Coffee Break
- 10:40 am - 11:20 am **Punit Parmananda** (IIT Bombay)
"Noise Induced Regularity in Electrochemical Systems"
- 11:20 am - 11:35 am Discussion
- 11:35 am - 12:15 pm **István Kiss** (Saint Louis University)
"Synchronization of Small Networks of Electrochemical Oscillators on Macro- and Microscale"
- 12:15 pm - 12:30 pm Discussion
- 12:30 pm Lunch
- 1:30 pm - 4:00 pm Free Time
- 4:00 pm - 6:00 pm Poster Session IV
- 6:00 pm Dinner
- 7:30 pm - 9:30 pm **Design of 'Robots'**
- 7:30 pm - 7:40 pm Discussion Leader: **Kenneth Showalter** (West Virginia University)
- 7:40 pm - 8:20 pm **František Štěpánek** (Institute of Chemical Technology, Prague)
"Design, Synthesis and Functionality of Structured Microparticles for Chemical Robots"
- 8:20 pm - 8:35 pm Discussion
- 8:35 pm - 9:15 pm **Ryo Kobayashi** (Hiroshima University)
"Locomotion of Animals, Design of Robots, and Mathematics"
- 9:15 pm - 9:30 pm Discussion

FRIDAY

- 7:30 am - 8:30 am Breakfast
- 9:00 am Departure
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