

Swarming by Nature and by Design

Monday February 27, 2006

- 8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:50–9:00 *Welcome and Opening Remarks*
- 9:00–10:00 **Stephen Simpson** (University of Sydney)
Mass marching in locusts and cannibal crickets: new insights into collective movement
- 10:00–10:30 *Break*
- 10:30–11:30 **Iain Couzin** (University of Oxford)
Collective Animal Behavior
- 11:30–1:30 *Lunch (on your own)*
- 1:30–2:30 **Emma Despland** (Concordia University)
Synchronization of behaviour in groups of locusts and caterpillars
- 2:30–3:30 **Andrea Bertozzi** (UCLA)
Swarming by Nature and by Design
- 3:30–4:00 *Break*
- 4:00–5:00 **Daniel Grunbaum** (University of Washington)
Key elements of individual behaviors causing diverse group and population-level dynamics in schooling fish.
- 5:00–12:00 *Poster Session*
- 5:00–6:30 *Wine/Cheese Reception (Hosted by IPAM)*

Tuesday February 28, 2006

- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Udo Erdmann** (Humboldt-Universität)
Dynamics of Swarms - A Physicists Approach
- 10:00–10:30 *Break*

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- 10:30–11:30 **Maria D’Orsogna** (UCLA)
The road to collapse: pattern formation, stability and collapse of 2D interacting particles
- 11:30–1:30 *Lunch (on your own)*
- 1:30–2:30 **John Baillieul** (Boston University)
Structured and Stochastic Rules for Motions of Groups of Robotic Agents
- 2:30–3:30 **Herbert Levine** (University of California, San Diego)
Self-engineering capabilities of bacterial colonies
- 3:30–4:00 *Break*
- 4:00–5:00 **Naomi Leonard** (Princeton University)
Collective Motion in Engineered and Natural Multi-Agent Systems

Wednesday March 1, 2006

- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Carolyn Boettcher** (Raytheon)
Experimental Results of Using Swarming Techniques for Real-time Tasking of UAVs
- 10:00–10:30 *Break*
- 10:30–11:30 **Francesco Bullo** (UC Santa Barbara)
Motion coordination for multi-agent networks
- 11:30–1:30 *Lunch (on your own)*
- 1:30–2:30
TBA
- 2:30–3:30 **Vijay Kumar** (University of Pennsylvania)
Scalable Approaches to Deploying Swarms of Multiple Vehicles
- 3:30–4:00 *Break*
- 4:00–5:00 **Eric Justh** (University of Maryland)
Natural frames and the design of interaction laws in three dimensions
- 5:00–6:30 *Dinner (Hosted by IPAM)*

Thursday March 2, 2006

- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **Claire Tomlin** (Stanford University)
Distributed Optimization for Multiple Aircraft and Airlines
- 10:00–10:30 *Break*
- 10:30–11:30 **A Morse** (Yale University)
Reaching a Consensus in a Dynamically Changing Environment
- 11:30–1:30 *Lunch (on your own)*
- 1:30–2:10 **Bruno Eckhardt** (Philipps-Universität Marburg)
Modelling Daphnia Swarming
- 2:10–2:50 **Edward Ott** (University of Maryland)
Dynamics of a Continuum Model of Swarms
- 2:50–3:30 **Bruno Eckhardt** (Philipps-Universität Marburg)
Crowd Synchronization on the London Millennium Bridge
- 3:30–4:00 *Break*
- 4:00–5:00 **Chad Higdon-Topaz** (UCLA)
Social biological organisms: aggregation patterns and localization

Friday March 3, 2006

- 8:30–9:00 *Continental Breakfast*
- 9:00–10:00 **P. S. Krishnaprasad** (University of Maryland)
Pursuit, Stealth and Cohesion: Lessons from Nature
- 10:00–10:30 *Break*
- 10:30–11:30 **Richard Murray** (California Institute of Technology)
Cooperative Control of Multi-Vehicle Systems
- 11:30–1:30 *Lunch (on your own)*
- 1:30–2:30 **Gordon Swartzman** (University of Washington)
A bird's eye view of fish schools
- 2:30–3:30 **Emilio Frazzoli** (UCLA)
Dynamic Task-Based Coordination of Vehicle Networks
- 3:30–4:00 *Break*

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4:00–5:00 **Bjorn Birnir** (UC Santa Barbara)
Simplicity and Swarming in Discrete and Continuous Models of Pelagic Fish

