The 6th Understanding Complex Systems Symposium will be May 15-18, 2006 at the UIUC

5th UNDERSTANDING

C s O Y M S P T L E e M x S

Symposium

Focus this year: Computational Complexity and Bioinformatics

Video Summaries

Images 1, Images 2, Images 3 by Russ Abbott

Slides and Audio Files for each Session

Student Competition Results

May 16-19, 2005
Department of Physics
University of Illinois at Urbana-Champaign

The symposium **Understanding Complex Systems** is designed to bring together researchers from many academic disciplines and industry and stimulate cross-disciplinary research activities to build and advance the Complex Systems Research community. A small group of distinguished invited speakers will introduce key complex systems concepts in the context of their discipline. These invited plenary talks are on a 'Scientific American' level. Three hands-on tutorials are in parallel with technical sessions, covering the most recent research findings. The organizers will provide information about **funding opportunities** for complex systems research and promote linkages for interdisciplinary proposals.

Keywords: computational complexity, algorithmic complexity, minimal algorithms, NP-complete, cell as a system, genomics, proteomics, metabolomics, systems biology, informatics, chaos fractals, neural nets, genetic algorithms, nonlinear dynamics, cellular automata, avalanches, granular materials

The conference helps to **build the Complex Systems research**
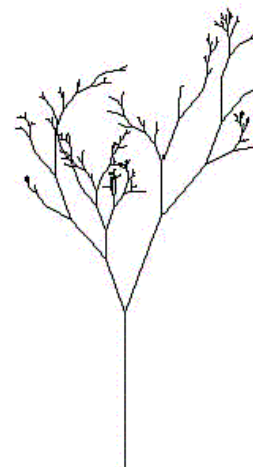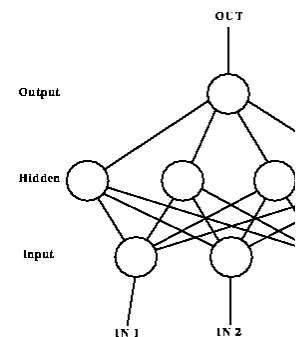
community. In addition, it offers all presenters of posters and talks an excellent opportunity to **publish high quality research quickly** in the journal Complexity through an accelerated referee process. Complexity is a leading journal in the field.

Opening Keynote Talk:
Paul Lauterbur, Nobel Prize in Physiology or Medicine, Chemistry, University of Illinois at Urbana-Champaign

Session Keynote Talks:
Eshel Ben-Jacob, Pro-President of the Israel Physical Society, Tel Aviv University, Israel
Bruce Wheeler, Interim Head of Bioengineering Dept., University of Illinois at Urbana-Champaign
Duane Johnson, Director of the Materials Computation Center, University of Illinois at Urbana-Champaign
Bruce R. Schatz, Director of the Community Architectures for Network Information Systems (CANIS) Laboratory, University of Illinois at Urbana-Champaign
Bill Greenough, Beckman Institute, Director of the Center for Advanced Studies, University of Illinois at Urbana-Champaign
Jonathan Sweedler, Director of the Biotechnology Center, University of Illinois at Urbana-Champaign

After Dinner Talk:
Charles Zukoski, Vice Chancellor for Research, University of Illinois at Urbana-Champaign

Plenary Talks:
Marc Snir, Head of Department of Computer Science, University of Illinois at Urbana-Champaign
Raissa D'Souza, Microsoft Research, Microsoft Corporation, Redmond, Washington
David Wolpert, Intelligent Systems Division, NASA Ames
Eric Jakobsson, Director of Center for Bioinformatics & Computational Biology, National Institutes of Health
Karl Koehler Deputy Director of 21st Century Research and Technology Fund
Hassan Aref, Dean of College of Engineering, Virigina Tech
Timothy G. Buchman, Past President of Society of Critical Care Medicine, School of Medicine, Washington University
Fred Cooper, Los Alamos National Lab and Interdisciplinary Research Program, Physics Division, National Science Foundation
Vernon L. Towle, Chair of Department of Neurology, The University of Chicago Hospitals
Herbert Levine, Physics, University of California at San Diego
Gottfried Mayer-Kress, Kinesiology, Pennsylvania State University
Frank Moss, Director of the Center for Neurodynamics, UMSL

Leonard M. Sander, Physics, University of Michigan
Cosma Shalizi, Center for the Study of Complex Systems, University of Michigan
Jonathan Machta, Physics, University of Massachusetts Amherst
Nigel Goldenfeld, Physics, Leader of Biocomplexity Program at The Institut for Genomic Biology, UIUC
Hava Siegelmann, Computer Science, University of Massachusetts Amherst
Kimberly Hill, Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign
Roy Adler, IBM Research Division, Thomas J. Watson Research Center
Eric Kostelich, Mathematics and Statistics, Arizona State University
Philip W. Phillips, Physics, University of Illinois at Urbana-Champaign
Victor M. Yakovenko, Physics, University of Maryland
Bruce J. West, Chief Scientist, Mathematical & Information Sciences Directorate US Army Research Office
Walter Goldburg, Physics, Pittsburgh University
Allen Hunt, Physics, Wright State University
Philip Maini, Oxford University, United Kingdom
James Glazier, Director of Biocomplexity Institute, Indiana University, Bloomington
Alex Travesset, Physics, Iowa State University
Jurgen Scheffran, Program in Arms Control, Disarmament, and International Security, University of Illinois at Urbana-Champaign
Bruce Hannon, Geography, University of Illinois at Urbana-Champaign
May Berenbaum, Head of Entomology, University of Illinois at Urbana-Champaign
Erik Luijten, Materials Science and Engineering, University of Illinois at Urbana-Champaign

Tutorials: There will be three 90 min hands-on tutorials that will teach basic concepts and build intuition. No prerequisite knowledge is required. - Tutorial I, May 17, 1:00pm, Chaos and Harmony - Tutorial II, May 18, 1:00pm, Tree-like Graphs and Fractals - Tutorial III, May 19, 1:00pm, Artificial Life - Cellular Automata, Genetic Algorithms, Neural Nets The tutorials are located in 141 Loomis Lab.

Schedule

List of Participants (Click here)

Please check the www page for the previous symposium. Click here for *2003 CONFERENCE PICTURES.*

<u>Call for Papers:</u> All participants are welcome to contribute a <u>30-min. talk</u>, or to present a <u>poster</u> in the poster session, or <u>communicate a paper</u> at the preprint table during the coffee breaks.

Please send a brief (<150 words) abstract as soon as possible by E-mail to a-hubler@uiuc.edu and indicate on your <u>registration form</u> the type of your presentation. The <u>conference schedule</u> will be updated daily.

The conference offers an excellent opportunity to publish high quality research quickly in the journal <u>COMPLEXITY</u> through an accelerated referee process. <u>COMPLEXITY</u> is a leading journal in the field.

If you intend to communicate a paper at the preprint table, please bring a sufficient number of copies of your paper to the symposium.

<u>Organizing Committee:</u>
<u>Eshel Ben-Jacob</u>, Physics, Tel Aviv University, Israel
<u>Jim Crutchfield</u>, Physics, UC Davis, U.S.A.
<u>Alfred W. Hubler</u>, Physics, UIUC, U.S.A. (chair)
<u>Eric Jakobsson</u>, Center for Bioinformatics & Computational Biology, National Institutes of Health, U.S.A.
<u>John Whitmarsh</u>, Mathematical Biology, National Institutes of Health, U.S.A.

<u>Local Organizing Committee:</u>
<u>Bruce Schatz</u>, Institute for Genomic Biology, UIUC, schatz@igb.uiuc.edu, (217) 244-0651
<u>Robert M. Clegg</u>, Physics, UIUC, rclegg@uiuc.edu, (217) 244-8143
<u>Alex Scheeline</u>, Chemistry, UIUC, scheelin@uiuc.edu, (217) 333-2999
<u>Karin Dahmen</u>, Physics, UIUC, dahmen@uiuc.edu, (217) 244-8873
<u>Samuel N. Beshers</u>, Entomology, UIUC, beshers@pop.life.uiuc.edu, (217) 333-4971
<u>Noshir Contractor</u>, Speech Communication & Psychology, UIUC, nosh@uiuc.edu, (217) 333-7780
<u>Tom Anastasio</u>, Molecular & Integrative Physiology, Biophysics, Computer Science, UIUC, tja@uiuc.edu, (217) 244-2895
<u>Alfred W. Hubler</u>, Physics, UIUC, a-hubler@uiuc.edu, (217) 244-5892

Event Coordinator: <u>Kirstin Phelps</u>, kphelps@uiuc.edu. (217) 433-3744

<u>Advisory Board</u>

Conference Staff (click here)

Paper Publications:

All registered participants are invited to submit a research paper.

Instant Online Publication. All submitted papers will be published within a few days on a web server with the date at which they were received. We accept all electronic file formats, but we recommend the use of PDF, MS Word, or HTML. The papers will stay online for a couple of years. The papers will be removed from the web server at the authors request.

Longterm Journal Publication. All registered participants are invited to submit a research paper for publication in the journal COMPLEXITY (click here for authors instructions) through an accelerated referee process. The conference papers will be in two issues of the journal Complexity. The deadline for research paper submissions for the first issue is September 30, 2005. The deadline for the second issue is November 15, 2005. The research papers should be submitted to the editorial office of Complexity by email (complexity2@comcast.net) or mail (Joleen Rocque-Frank, PO Box 6865, Santa Fe, NM 87502, U.S.A.) and labeled as "invited conference paper".

Typically authors will take advantage of both options for their paper.

Book table: There will be a display with Complex Systems text books and journals.

Location: 141 Loomis Lab (Green Street & Goodwin Ave) University of Illinois at Urbana-Champaign Urbana IL, 61801, USA

Mailing Address:
Alfred W. Hubler
Department of Physics
University of Illinois at Urbana-Champaign
1110 W Green Street
Urbana IL 61801

Transportation and Lodging: It is often very expensive to fly directly to Champaign-Urbana's local airport. Many visitors (particularly international visitors) choose instead to fly into the nearest major international airport, Chicago's O'Hare Airport, and then travel to Champaign-Urbana by a charter bus or by train. If you need maps or driving directions, click here.

You might also want to check today's Chicago area traffic congestion map.

The twin cities Urbana and Champaign have an Amtrak station, Greyhound station, and a regional airport (Willard Airport, airport abbreviation: CMI - Champaign).

Click here for Hotel Information for Urbana and for Champaign. Several hotels offer free shuttle from the Champaign airport.

The MTD is an excellent public bus system connecting the campus with the airport and other locations in town.

In addition there is a shuttle service from the Champaign airport to the university (reservation required: Corky's 217 - 352 3121).

Click here for Visitor Info, Complete Hotel Listing, Going Out, Weather

For questions about lodging and transportation please contact the event coordinator Kirstin Phelps, kphelps@uiuc.edu. (217) 433-3744.

Conference Fee:
The regular conference fee is $190 ($150 early registration before April 15, 2005) and includes six issues of the journal Complexity (contain conference papers), continental breakfast and lunch May 16-19 and the speaker appreciation dinner). The conference fee for students is $45 with speaker appreciation dinner and $20 without the appreciation dinner. For UIUC students and faculty there is no conference fee, but a $30 charge for the speaker appreciation dinner and a $7.75 charge for lunch tickets. Click here for registration and payment.

A limited travel fund is available. It will be used primarily to encourage participation by underrepresented minorities and women graduate students. To apply for travel support, please email event coordinator Kirstin Phelps, kphelps@uiuc.edu with

- a one paragraph summary of research or policy involvement with complex systems
- either a poster title or statement of why you wish to participate in the conference
- contact information.

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To register please click here. The sooner you register the better the time slot of your presentation. Flyer

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