ANNUAL REPORT
7/05 - 6/06

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Director's Statement

It may be difficult to believe, but the annual report for the *Institute for Mathematical Behavioral Science*s is one of the pleasures of being the IMBS director. After all, the explicit goal of the IMBS is to find ways to harness the power of mathematical reasoning to address the many pressing problems coming from the social and behavioral sciences. This annual report provides an opportunity to sit back and review what has been accomplished over the last year.

Rather than reading the report in the presented and admittedly bureaucratic order, a more productive approach to appreciate what is going on in the IMBS is to start with Section II-D, which summarizes some of the basic research findings of Institute members. Then jump to Section VI-B, which lists some of the publications, and Section VI-D, which describes some of the colloquia and invited talks delivered this last year by Institute members. A perusal of these sections will indicate the influence that IMBS members are having in these academic areas.

In order for IMBS to influence the manner in which research is done in these areas, we have developed an active program ranging from our several research conferences (Section IV-A), our weekly colloquium series (see Section IV-E for a listing of the IMBS colloquia speakers as well as a listing of the colloquia for our active research focus group on *Social Dynamics and Evolution*), to our various research seminars that address specific research issues (Section II-E). Both for budgetary reasons and by design so that we can ensure considerable discussions and interactions, our IMBS conferences tend to be small in size, large in talent, and highly interdisciplinary. A review of the agendas for these meetings (Section IV-A) will show that we usually have about eight or nine main speakers where most of them are internationally known in their field. Over the last year, these conferences tackled research questions ranging from how decisions and elections involving multiple variables can, and should be made, an understanding of social norms evolve, and a critical examination of where the area of mathematical economics could and should be headed.

Our research seminars also prove to be interdisciplinary. As an example, an ongoing debate in the psychological study of human color categorization and naming is whether universal tendencies exist in how different linguistic societies categorize and name perceptual color experiences. To address this issue, one of our groups pulled together mathematicians, cognitive scientists, and members from the philosophy of science department to examine how evolutionary game theory can provide answers. Based on their findings, a paper was written and a grant proposal for further research in this direction is being prepared. Another group, consisting of mathematicians working on problems of visualization and experts from cognitive science in vision, explored the connections between the mathematics of visualization and the problems of vision as identified by cognitive science. Also, as described in this report, one of our very active groups is the focused research unit on Social Dynamics and Evolution; for instance, check a description of their activities in Section II-E and the listing of their colloquia in Section IV-E.

Our graduate program, which is designed not only for our students but also to assist students with interests that are compatible with the IMBS, is growing. To ensure that all of these students will become involved in research at an early stage, last year the IMBS introduced a course on research issues where each week different students gave presentations

on their own work. The graduate students continue to organize an annual conference (agenda in Section IV-A) that attracts a large audience of graduate students and faculty. Each fall, those students that the IMBS supports in summer research have an opportunity to describe this work.

A very important part of the IMBS is Janet Phelps. Her responsibilities have grown to include all aspects of what the Institute does, from the planning and running of conferences, recruiting graduate students and faculty, and even fundraising and grants. She makes important contributions to what successes the IMBS enjoys.

2005-06 was an excellent year for the IMBS, and we are looking forward to 2006-07.

Sincerely,

Don Saari

I. ORGANIZATION AND ADMINISTRATION

A. Administration

The Director of the Institute for Mathematical Behavioral Sciences is Professor Donald G. Saari. He reports both to the Dean of the School of Social Sciences and to the Vice-Chancellor for Research and Graduate Studies. An Executive Committee for consultation and decision-making regarding the long-term direction of the Institute assists the Director. (Section B below).

The staff of the Director's office consists of one Administrator and a part-time Administrative Assistant. Presently, some bookkeeping and personnel matters are being taken care of by the School of Social Sciences.

Director:	Donald G. Saari, 2003-present
Previous Directors:	R. Duncan Luce, Founding Director, 1989-1998
	William H. Batchelder, 1999-2003
Graduate Advisor:	Louis Narens
Administrator:	Janet Phelps
Administrative Assistant:	Grace Lee

B. Executive Committee

Michael D'Zmura, Professor of Cognitive Sciences
Bernard Grofman, Professor of Political Science
Katherine Faust, Professor of Sociology
L. Robin Keller, Professor, Operations and Decisions Technologies
Mark Machina, Professor of Economics, UC San Diego
Stergios Skaperdas, Professor of Economics
Brian Skyrms, Professor of Philosophy

II. RESEARCH

A. Current Research Programs

The 59 members of the Institute for Mathematical Behavioral Sciences (IMBS) and their research interests are listed in Appendix A.

The IMBS is partitioned into five research clusters. These are listed below and are informal intellectual groupings, not highly formal structures.

***1. Measurement Theory, Foundational Issues, and Scaling Models*:** Antonelli, Barrett, Batchelder, Bennett, Burton, Falmagne, Luce, Maddy, Narens, Romney, and Skyrms

2. Statistical Modeling*:*

- ***Cognitive****:* Baldi, Batchelder, Dosher, Falmagne, Indow, Iverson, Riefer, Romney, Smyth, Steyvers, and Yellott
- ***Economic***: Brownstone, DeVany, Poirier, Saari, and Small
- ***Sociological/Anthropological***: Butts, Faust, Freeman, White

3. ***Individual Decision Making****:* Birnbaum, Keller, Luce, Machina, Narens, and Saari

4. ***Perception and Psychophysics***:
   - ***Vision****:* Braunstein, Cicerone, Chubb, DeFigueiredo, D'Zmura, Hoffman, Indow, Iverson, Romney, Sperling, Srinivasan, Yellott, and Zhao
   - ***Psychophysics and Response Times*****:** Brown, Falmagne, Iverson, Luce, Narens, and Yellott

5. ***Social and Economic Phenomena***:
   - ***Economics and Game Theory*****:** Branch, Brownstone, Burton, Garfinkel, Komarova, Kopylov, McBride, Poirier, Skaperdas, Skyrms, Saari, and Small.
   - ***Public Choice*****:** Cohen, Glazer, Grofman, Kaminski, Keller, McGann, and Uhlaner
   - ***Social Networks*****:** Batchelder, Butts, Boyd, Faust, Freeman, Romney, and White
   - ***Social Dynamics and Evolution:*** Butts, Narens, Romney, Saari, Skyrms, Smyth, Stern, and White

B. Publications

The members who have replied report a total 187 journal publications (published or in press) for the current academic year. These are listed in Appendix B.

The IMBS has a technical report series that is available to all members and qualified graduate students who are submitting a paper to a refereed journal or book. The series editor is Donald Saari. Appendix C lists the 10 technical reports issued during the academic year. Most papers can be found on the Insitute's web site at www.imbs.uci.edu.

C. Public Talks and Colloquia

IMBS members actively participated in numerous off-campus research seminars and conferences. The members who replied gave a total of 217 talks listed in Appendix D. Their awards and achievements for this year can be found in Appendix E.

D. Summaries of Significant Findings

An important aspect of the Institute is the research conclusions developed by its members. What follows is a sample of what has happened this year.

Measurement Theory, Foundational Issues, and Scaling Models

Statistical Modeling

William Batchelder

We have noted that there is a great deal of similarity in the data structures used by cognitive modelers and by psychometric test theorists, and further both groups develop parametric statistical models for their data. Despite these similarities, the statistical models the two groups use to analyze their data are quite different. The cognitive modelers tend to have

parameters that are interpreted in terms of basic information processing steps in completing a cognitive task, where as the psychometricians tend to have parameters that quantify individual differences in subject abilities and item difficulties. Psychometric models typically lack processes for how questions are answered and cognitive models typically lack statistical mechanisms for dealing with individual differences. Our group has been working to bridge these differences. We have been developing hierarchical Bayesian versions of multinomial processing tree (MPT) models that are designed to share the good features of both types of models.

Dale Poirier

Over this past year I finished working with Professors Gary Koop of the University of Leicester and Justin Tobias of Iowa State University on a textbook *Bayesian Econometrics* for the *Econometrics Exercises Series*, edited by K. Abadir, J. Magnus, and P. C. B. Phillips. Cambridge University Press has accepted this book for publication. I have also continued working with Professor Ivan Jeliazkov of UCI on "A Statistical Model of Intifada Fatalities" which models the daily fatality counts of Israelis and Palestinians during the ongoing Intifada. Finally, Professor Fabio Milani of UCI and me prepared a comment on an article to be published in *Econometric Reviews* on dynamic stochastic general equilibrium models. These models have become quite popular at numerous central banks for purposes of structural forecasting.

Decision Making

Robin Keller

In "A Multiple-Objective Decision Analysis for Terrorism Protection: Potassium Iodide Distribution in Nuclear Incidents," Tianjun Feng and L. Robin Keller present a multiple-objective decision analysis approach to qualitatively and quantitatively evaluate different potassium iodide (KI) distribution plans for a hypothetical local region. They developed this approach for a U.S. National Research Council committee which was charged with figuring out the best means for protecting people against potential thyroid cancer due to the release of radioactive iodine from nuclear incidents occurring due to terrorism or accidents. They first identify an objectives hierarchy and then develop the single attribute value functions and the weights for the objectives using a swing weight method. The identification of the largest value gaps between the *status quo* and the ideal situation helps to develop potential KI distribution plans. They then use an additive value function to assess the performance of these new alternatives with the *status quo* as a benchmark by computing their overall values. Finally, sensitivity analysis for the KI problem shows how this approach can create more key insights for the improvement of health and safety decision-making processes.

Natalia Komarova

I have been working in two main areas: mathematical modeling of cancer and mathematical modeling of human language. In my cancer modeling research, I concentrated on two main aspects: (1) spatial stochastic modeling of mutant spread and (2) probability distribution of the number of mutants in a tumor of a given size. In particular, I have developed an analytically tractable model of mutant invasion. In my language research, I have been working with a graduate student to try and understand the connection between syntax and semantics in the English language.

Vladimir Lefebvre

During this period I have been working on the development of the reflexive model of group behavior. In the framework of this approach, each agent has mental representation of the self and other agents. This model allows us to predict the patterns of agents' behavior in various situations, such as international conflicts.

R. Duncan Luce

A major focus in psychophysics has been: Just what sorts of number distortions occur? A global psychophysical theory of signal intensity, e.g., loudness, (Luce, 2002, 2004) led to a series of experimental tests with my collaborator (and ex-student) Ragnar Steingrimmson. Two 2005 articles sustained the major behavioral (i.e., testable) axioms of the theory, but left open the mathematical forms of two free functions: a psychophysical transformation of intensity into subjective intensity, and a weighting function that has a simple relation to judgments of ratio productions of subjective intervals. We first focused the form of the psychological function (Steingrimsson & Luce, 2006), whereas work this year concerned the weighting function W. A different axiomatization (Narens, 1966) led to a power function which was tested by Ellermeier and Faulhammer (2000) and soundly rejected. Little note was taken of the fact that one of Narens' axioms forced $W(1) = 1$. We dropped that assumption, found a modified behavioral equivalent for a general power function, and established experimentally that it accounted for the individual data of 9 of 11 respondents. We also studied a more general form--named for Prelec (1998) who first axiomatized it--that amounts to an exponential of a power of $-lnp$. When that power is 1, it reduces to a power function. That form was experimentally rejected, but again under the restrictive assumption that $W(1) =1$. Aczél and Luce (submitted) established a behavioral equivalent that did not force $W(1) = 1$. An experiment confirmed that the two respondents that did not satisfy the condition for a power functions did satisfy this condition.

Both forms lead to a natural explanation of why, in magnitude production and estimation, sequential effects should be found, as they are. We are just beginning to explore this in some detail. Also, it has long been known in audition that when people match a second intensity to the first one, typically they do not match physically (time-order error). This is predicted by the model when $W(1) \neq 1$. We are in the process of investigating properties of the model and comparing them to existing data. It looks quite promising and may make more coherent the complex patterns of empirical results.

Louis Narens

During the last year I completed 2 book manuscripts: Introduction to the Theories of Measurement and Meaningfulness and the Use of Invariance in Science (In press). Qualitative and Subjective Probability (under review).

Donald Saari

My research for this year emphasized the consequences of using different decision rules ranging from voting to individual decisions. A second theme involved the development of a qualitative theory for evolutionary games.

Perception and Psychophysics

Scott Brown

In collaboration with Tony Marley (University of Victoria) and Andrew Heathcote (University of Newcastle) I established a new theory for how humans remember the sizes of objects in ordered sets ("absolute identification"). Previously, decisions on the magnitudes of such objects were considered to be "sequential" - that is, people were thought to consider each object only in relation to the objects considered recently. We showed that this account is flawed, and developed a new theory that puts the emphasis on the memory representation of such sets.

Barbara Dosher

My laboratory has studied how people's ability to perform perceptual tasks can be improved with practice or training, what kinds of inefficiencies in visual processing limit performance, and which are susceptible of improvement. One focus has been on the nature of the training environment and the role of feedback and the mix of task difficulty on the generality of perceptual training to other tasks. As part of this project, a model consisting of a visual processing analysis of orientation and spatial frequency tuned sensor is combined with a neural network architecture to predict complex patterns of perceptual learning in changing test environments.

Donald Hoffman

The possibility of spectrum inversion has been debated in the philosophy of mind since it was raised by Locke, and is still discussed because of its implications for functionalist theories of conscious experience. This paper provides a mathematical formulation of the question of spectrum inversion, and proves that such inversions, and indeed bijective color scramblings in general, are logically possible. Symmetries and asymmetries of color space are, for purposes of the proof, irrelevant. The proof entails that conscious experiences are not numerically identical with functional relations. It leaves open the empirical possibility that functional relations might, at least in part, be causally responsible for generating conscious experiences. Functionalists can propose causal accounts that meet the normal standards for scientific theories, including numerical precision and novel prediction; they cannot, however, claim that, because functional relationships and conscious experiences are identical, any attempt to construct such causal theories entails a category error.

Tarow Indow

The collaboration with Kimball Romney on the Munsell Color System is continued. The Munsell Color System is a collection of standard color chips painted according to the standard authorized by the Optical Society of America (OSA). Since 2003, we have published three articles on the analysis of spectral reflectance curves of Munsell standard chips in use in USA and this year we added one more. Now we have another set of spectral reflectance curves of standard Munsell color chips painted in Japan. Similar analyses of these data are now in progress. The ultimate purpose is to make explicit the relationship between the structure of physical specification standardized by OSA and the cognitive structure of human perception of colors.

Kim Romney

For some time in collaboration with Roy D'Andrade, James Fulton, Taro Indow, and others, I have been attempting to find out the best way to represent the reflectance spectra of 1269 Munsell color chips in Munsell conceptual space. Methods for doing this include: (a) The internationally accepted CIE L*a*b* system. (b) The D'Andrade/Romney method published in 2003 in *Proceedings of the National Academy of Sciences*, 100:6281-6286. (c) An *ad hoc* method derived from Romney and Indow's 2003 article in *Color Research and Application* 28:182-196 in which I first cube root the reflectance spectra and then calculate a Euclidean representation. (d) Currently I am working with Fulton on a prime color model. Independent researchers have mathematically proved that, given a set of color matching functions, there exists a unique set of three monochromatic spectral lights that optimizes luminous efficiency and color gamut. These lights are called prime colors. We present a method for transforming reflectance spectra into Munsell color space using hypothetical absorbance curves based on Gaussian approximations of the prime colors and a simplified version of opponent process theory. The derived color appearance system is represented as a three-dimensional color system that is qualitatively similar to a conceptual representation of the Munsell color system. A comparison of these four models demonstrates that they all converge on representations that are close to linear transformations of each other. The prime color model has the advantage of simplicity.

George Sperling

Nothing particularly mathematical this year. However, we (Chia-huei Tseng, Joetta Gobbel, Zhong-Lin Lu, and I) did create a special kind of stereo motion display in which a rapidly moving grating appears to be standing still. This phenomenon of motion standstill actually is most interesting for what it demonstrates about the interaction of motion and shape perception: When the visual system receives input from an object that is moving about in space, it abstracts, for conscious perception, a single representative (stationary) image of the moving object. To perceive motion, a separate computation by the motion system is required.

Jack Xin

(1) Found a many to one discrete auditory transform to mimic the mapping of sound from ear to brain of humans, and constructed a perceptually equivalent inversion. The inverted signal sounds the same as the input signal though mathematically different. (2) Proposed and carried out a first

principle (partial differential equation) based sound compensation scheme to simulate hearing aids gain functions in quiet and in noisy environment. This work provided a foundation for adaptive “smart” hearing aids design in the future. (3) Applied nonlinear ear models to perform various sound signal processing tasks (denoising, enhancement). (4) Established variational principle of reaction-diffusion front speeds in random shear flows under quadratic kinetics (Kolmogorov-Petrovsky-Piskunov). Further apply the variational principles to bound and compute front speed statistical properties without resolving the original stochastic partial differential equations over large space and temporal scales.

Jack Yellott

I have been studying the possibility of creating visual stimuli that are immune to the phase component of optical defocus in the human eye—the component that produces the contrast-reversal distortion known as “spurious resolution”. Preliminary computational work (reported at the 2005 OSA vision meeting) showed that for levels of defocus typical in presbyopic reading (ca. 3 diopters), correcting spurious resolution can produce a dramatic improvement in text legibility, and raised interesting questions about the mathematical properties of this kind of phase-only deconvolution. In particular, computation shows that the phase-corrected pointspread function for both geometrical and wave optics models of defocus has a distinctive form involving a ring of “negative light”, which imposes a fundamental limit on correction. In addition, considerations of physical realizability imply an intrinsic difference between the levels of improvement that can be achieved by pre-correcting objects for subsequent defocus (as envisioned by our “defocus –immunization” goal), and post-defocus correction (e.g., by computer processing of defocused images recorded by a camera). Now more recent work during the past year has revealed the geometrical structure of phase deconvolution, in which the Fourier spectrum of the sign of the eye's optical transfer function plays the key role. Such spectra involve variants of the derivatives of Dirac delta functions, and have only recently become well understood. I now have a complete theory of phase-deconvolution for defocused optical systems with square pupils (which explains the overall structure of the process for any pupil shape), and a nearly complete theory for circular pupils (frustrated only by the slightly irregular zeros of the Bessel function J1). This theory allows one to deduce the effects of various wrinkles on the correction process (e.g., the effect of incorrect parametric assumptions), rather than having to resort to new computational simulations for every case.

Zhao

Develop efficient and robust computer algorithm for solving partial differential equations. In particular an iterative method of optimal complexity, the fast sweeping method, has been further developed for a wide class of Hamilton-Jacobi equations, which has wide applications in optimal control, computer vision, geometric optics, etc. Also a direct imaging and recognition algorithm for extended objects is developed using scattered wave field. This method has applications in ultrasound imaging. Other progress has been made in computational physics.

Social and Economic Phenomena

(a) Economics and Game Theory

William Branch

In 1984 the volatility of GDP and inflation fell by one half. This has been a puzzle for monetary economists and policymakers at the Federal Reserve. Most monetary economists think that the conduct of better monetary policy during the 1980's and 1990's helped produce this "Great Moderation" but no formal channel has been established. Indeed, most macroeconomic models predict that lower inflation volatility comes at the cost of greater GDP volatility. In two recent papers I have examined whether limited information processing and heterogeneous beliefs on the part of private sector agents are important ingredients for explaining lower economic volatility. The key finding is that monetary policy has an indirect effect that can make agents less attentive to economic news. This "anchoring" of expectations tends to lower economic volatility.

David Brownstone

Most current estimates of the value of new transportation or environmental improvements are based on survey respondents' choices between hypothetical alternatives. Using new data we collected from the I15 toll road facility in San Diego, Seiji Steimetz, Tom Golob, and I have been comparing results based on commuters' actual and hypothetical choices. We find that the hypothetical choices yield much lower estimates of the critical value-of-time saved from taking the toll facility. Most importantly, we show that neither sample selection (the tendency for commuters with high value of time to always choose the toll road), perceived or real differences in safety, or model specification bias can explain these differences. Recent work with Kenneth Small has replicated this finding from different studies of commuter behavior on the SR 91 toll road connecting Riverside and Orange Counties. This work will clearly have an impact in transportation economics and environmental economics where responses to hypothetical questions are treated as if they were responses to actual market choices.

Ami Glazer

My working paper "Ideological Externalities, Social Pressures, and Political Parties" offers a novel, and I think insightful, explanation for the formation of political parties. Members of political parties talk to each other often, and may thereby influence each other. For example, a liberal in a party of moderates may moderate his views. At the same time, the moderates in the party may become more sympathetic to liberal views. Voters in a district may favor such effects if they care about the ideology of officeholders in other districts. They may therefore prefer a candidate who affiliates with a party over an independent with the same position.

Igor Kopylov

In joint work with L. Epstein, I developed a novel theoretic model of cognitive dissonance. This model portrays an agent who adjusts beliefs after taking an action so as to be more optimistic about its possible consequences. In particular, the ex-post choice of beliefs is a part of the

representation of preference and not a primitive assumption. Behavioral characterizations can be given to comparisons like 'agent 1 exhibits more dissonance than agent 2'. This work builds on one of my earlier papers "Temptations in General Settings".

Michael McBride

The past decade has witnessed an explosion of interest in the scientific study of happiness. Economists, in particular, find that happiness increases in income but decreases in income aspirations, and this work prompts examination of how aspirations form and adapt over time. In the first experiment of its kind, I studied of how various mechanisms-past payments, social comparisons, and expectations-influence aspiration formation and happiness (satisfaction). I found that expectations and social comparisons significantly affect happiness, and that subjects care more about social comparisons once they have achieved a satisfactory outcome. These findings support an aspirations-based theory of happiness.

Brian Skyrms

I work in applying tools of rational choice, evolutionary game theory, learning dynamics, and social networks in understanding the genesis of the social contract.

Ken Small

In seeking to relieve urban highway congestion, many areas have introduced special reserved (express) lanes: either for high occupancy vehicles only (HOV lanes) or, more recently, for HOVs and customers willing to pay a toll – thus, "high occupancy toll (HOT) lanes." These attempts have had very limited impact on congestion, yet more effective policies that would price more widely fail politically. In work with Clifford Winston (Brookings Institution) and former graduate student Jia Yan (Hong Kong Polytechnic University), Small sought to identify more efficient yet politically viable road pricing policies by analyzing the behavior of motorists traveling on California State Route 91 (SR91) in Orange County, California, which includes HOT lanes. Confirming earlier work, they find that users of SR91 have high average values of travel time and of travel-time reliability, and that the distributions of these values exhibit great dispersion. They then show that by designing differentiated pricing schemes for general and express lanes that cater to such varying preferences, it is possible to improve efficiency compared to HOV or HOT, while generating only moderate negative direct impacts on road users. The policy in question would charge all users, but would allow them to choose from a lower or higher rate.

(b) Public Choice

Bernard Grofman

Models of party competition building on Downs (1957) have recognized that there are centrifugal and centripetal forces in party competition; but one such force, the existence of party primaries, has been remarkably neglected in recent literature. In Owen and Grofman (forthcoming) we consider party/candidate policy divergence in two-party competition in one dimension where there is a two-stage electoral process, e.g., a primary election (or caucus) among party supporters

to select that party's candidate followed by a general election. We develop a model in which (some or all) voters in the primary election are concerned with the likelihood that the primary victor will be able to win the general election and being concerned with that candidate's policy position. This model is similar in all but technical details to that given in an almost totally neglected early paper in Public Choice Coleman (1971) 11:35–60, but we offer important new results on electoral dynamics for candidate locations. In addition to accounting for persistent party divergence by incorporating a more realistic model of the institutions that govern elections in the U.S., the model we offer gives rise to predictions that match a number of important aspects of empirical reality such as frequent victories for incumbents and greater than otherwise expected electoral success for the minority party in situations where that party has its supporters more closely clustered ideologically than the supporters of the larger party (in particular, with a concentration of voters between the party mean and the population mean).

Marek Kaminski

A few words on the special issue of the JCR: It brings together papers that were presented at the interdisciplinary conference "Transitional Justice," held at the UCI on October 29-31, 2004. Transitional justice refers to formal and informal procedures implemented by a group or institution of accepted legitimacy around the time of transition out of an oppressive or violent social order, for rendering justice to perpetrators and their collaborators, as well as their victims. The papers in the volume come from various disciplines, such as anthropology, history, political science, and sociology. They are united by their common analytical, rather than descriptive, approach to the subject.

Abstract to Parametric Rationing Methods: In a rationing problem, a single homogeneous good is allocated among agents with possibly complex characteristics, or types. When types are single positive numbers (agents' claims), Young's theorem says that in the presence of continuity, a method of rationing is consistent and symmetric if and only if it can be represented by a continuous parametric function. This theorem is generalized to all separable type spaces. Related results include a characterization of non-continuous parametric methods and a simple criterion for deciding when a two-agent method can be consistently extended to a multi-agent method. An application to the multi-category bankruptcy problem is described.

Anthony McGann

In *The Logic of Democracy* (to be published this summer) I show that the requirement of political equality logically requires very precise political institutions – proportional representation and simple majority rule (without checks and balances). I also argue that the phenomenon of majority rule cycling (the fact that typically there is not a single alternative that is majority preferred to all others, or alternatively, the fact that there are multiple, overlapping winning coalitions) is not destructive to democratic theory. Rather it is the fact of cycling that allows us to reconcile minority protection with majority rule, and that forces people to engage in reasonable deliberation. Far from being a problem for democracy, it is majority rule cycling that makes democracy as we know it possible.

(c) Social Networks

John Boyd

In the paper with W.J. Fitzgerald, M. Mahutga, and D.A. Smith we developed a new measure for core versus periphery in a network. We applied this to the trade between 94 countries and found that from 1965 to 2000 the size of the core increased. Korea had the fastest relative growth in this period, while the US, the UK, and Germany have the largest declines.

Mike Burton

This year was mainly spent on administration and on fighting an unusual neurological disorder, which has necessitated my taking a medical leave this quarer. I am mainly working on two book manuscripts, and it may be a year or two before I have publications, so my answer to all of the questions below is that I have no new activity, except for item 3- a paper presented at the Annual Meetings of the Association for Social Anthropology of Oceania in San Diego, this February, on Food Systems in Kosrae and Yap, Micronesia.

Carter Butts

Although the field response in the early hours of a disaster such as the World Trade Center may appear disorganized and fragmented to observers and participants alike, such appearances can be deceiving. Using police reports filed by officers of the Port Authority of New York and New Jersey regarding activities on 9/11/01, Miruna Petrescu-Prahova, Remy Cross, and I have investigated the connectivity of communication and interaction networks among officers at the World Trade Center disaster. By integrating reports from multiple officers using statistical methods originally pioneered by UCI colleagues Kim Romney and Bill Batchelder, we have estimated the underlying network of interaction among officers at Ground Zero. In contrast to the narrative accounts of a fragmented response, we find that the PA responder network was generally well-connected, with nearly all officers tightly bound together within a single large cluster (or “giant component”). We conjecture that responders' perception of isolation may have arisen from a focus on local conditions, together with a lack of information regarding other responders' interactions. Indeed, most responders' personal accounts *do* show a lack of local cohesion; the connectivity of the global response emerges only when those individual stories are assembled into a comprehensive whole. This global understanding allows us to make more accurate predictions regarding individual and organizational responses to disaster, and may help us anticipate where communications will (or will not) break down in future events. Our work also underscores the value of the mathematical sciences in revealing hidden patterns within complex data. Where the unaided observer sees only fragmentation, the lens of science shows an underlying unity.

Douglas White

In 2006 *Physical Review E* published my simulation model, done with Santa Fe Institute physicists, for investigating the occurrence of scale-free, navigable, and other types of feedback and feed-forward phenomena in networks. The model led to new understandings of network

dynamics and demonstrated the existence of a universality class of networks that generates many of the known empirical network topologies from processes consistent with generalized ('Tsallis')

entropy models for non-independent interactions. Realizing the significance of this finding, I applied the same measurement and modeling techniques to data on city-size distributions from 23 historical periods in the last millennium. This led to an entirely new way to describe and theorize urban hierarchies and their dynamics, described in terms of long periods of normal city hierarchies punctuated by rapid transitions to and eventually back from equally long periods of slumped 'city-quake' distributions. This and my further discoveries this year form part of the key insights in a chapter on "Markets and Hierarchy" for *A New Perspective on Innovation and Social Change*, edited by Santa Fe Institute scientists David Lane, Geoffrey West (Time magazine 100: "Top 10 Scientists and Thinkers category for 2006"), Sander van der Leeuw, and Denise Pumain, a book that gives the results of our 1 million Euro project on Information Society as a Complex System. One discovery was that cityrise/cityquake oscillations double in length those of population oscillations and associated conflicts in the decline phases of major world regions such as China or Europe. I also discovered how thee two types of major historical and demographic/economic processes, cityquake and population oscillations, are dynamically interlocked. I found similar contrasts found in new research work this year, with a Japanese colleague on industrial production networks in Tokyo's largest Industrial District, as to how two forms of hierarchical supply-chain organization and their competing market mechanisms coexist in the industrial network of 8,500 firms.

D. Research Seminars and Activities

The research activities of the Institute members often result in graduate research seminars. Among those this year were:

Mathematical Models of Cognitive Processes [Batchelder]
Macroeconomics graduate student reading group [Branch]
Cognitive Modeling [Brown & Steyvers]
Network Theory [Butts]
Social Networks Research Group [Butts]
Comparative Public Policy [Grofman]
Mind-body Problem [Hoffman]
Face Perception [Hoffman]
Public Choice [Kaminski]
Evolution of Signaling Systems [Narens] (described below)
Theory of Political Economics [Saari]
Dynamical Systems [Saari]
Methods and Models [Saari, Narens]
Transportation Economics I [Small]
Special Topics in Human Performance [Sperling]
Human Sciences and Complexity Videoconference Seminar [White]
Social Networks and Dynamics [White]
Global Networks [White]
Computational and Applied Math Seminar [Xin]
MBS Math Visualization Seminar [Xin, Zhao] (described below)

MATHEMATICAL VISUALIZATION

A weekly seminar organized by Professors Saari, Xin, and Zhao, with the active participation of Professors Romney, Chubb, Sperling, Palais, and researcher Ragnar Steingrimsson was held on "Mathematical Visualization". Professor Xin described the seminars' goals as follows: "Mathematical models have appeared in recent years on representation of perceptive quantities such as colors, sounds (e.g. pleasantness, intelligibility, naturalness), among others. These quantities live in lower dimensional spaces than their corresponding physical stimuli (light or sound signals). It is of fundamental interest to study the efficient and robust mathematical representations of various percepts, their universal properties, and applications. Such a study is often accompanied by modeling and experiments; hence there is the need for interdisciplinary discussions. We hope to bring related researchers on UCI campus to IMBS to discuss the mathematics of perception. IMBS provides the ideal venue for an informal get-together and initial scientific exchange."

Some of the areas that the group hoped to explore were:

-How do you use math to describe something at a high level?
-How does vision develop?
- How does the left brain work together with right brain?
-What about music comprehension?
-How do you use numbers to measure something like pleasantness?

Some of the topics that were discussed are:

"Perceptual Ambiguity", presented by Professors Charles Chubb and Dick Palais.
"Formalizing measures of image visibility" presented by Professor Hongkai Zhao.
"Perception and mathematics of auditory signal processing", presented by Professor Jack Xin.

EVOLUTION OF SIGNALING SYSTEMS

A working group on the Evolution of Signaling Systems was organized by Professor Louis Narens. The group also consisted of Professors Jeff Barrett, Natalia Komarova and Brian Skyrms, along with IMBS Project Scientist, Kimberly Jameson, and IMBS Researcher Ragnar Steingrimsson. In addition, two graduate students from the Department of Philosophy, Rory Smead and Kevin Zollman, actively participated in this working group and its research projects. Several publications are expected from this year's activities. One article by Komarova, Jameson, and Narens is already under review.

Weekly meetings applying evolutionary game theory to color category evolution were conducted by Louis Narens, Kimberly Jameson and Natalia Komarova. These sessions included faculty, post-doctoral students, and graduate students.

SOCIAL NETWORK RESEARCH GROUP

The objective of the UCI Social Network Research Group is to:

- provide an informal setting for discussion of current and ongoing network-related research at UCI (and elsewhere);
- facilitate the exchange of information regarding new techniques, tools, data sources, and research findings;
- support graduate student training in the network field; and
- encourage collaboration among faculty and students on network-related topics.

The Network Research Group holds weekly meetings during the academic year. Attendance is open to all interested members of the university community, and "drop-ins" are welcome. Special topics may be designated for certain meetings -- all other meetings are considered to be available for open discussion. In the latter case, participants are encouraged to bring along their intractable problems, difficult questions, and mysterious software bugs, as well as topics for more general discussion or debate.

SOCIAL DYNAMICS AND EVOLUTION RESEARCH GROUP

In January 2004, the IMBS created a new focus research group on "Social Dynamics and Evolution," chaired by Douglas White. Their activities this year include the first two issues of their new *Structure and Dynamics: eJournal of Anthropological and Related Sciences,* which is electronically peer reviewed through UC eScholarship publications under the IMBS auspices. This subscription-free journal already has had more than 4,500 full-text article pdf downloads. The Social Dynamics and Evolution group received a sizable grant from a benefactor non-profit foundation to cover copy editing of their journal, and to fund MBS graduate students and faculty to collaborate with other scientists through visits to the Santa Fe Institute and across UC campuses. The other program they initiated is the UC Multicampus Group in Human Sciences and Complexity (UC-HSC). Formed and led by the chair and members of the Social Dynamics and Evolution group, UC-HSC started running in fall 2005 with year-long HCS Seminars with quarterly MBS conferences with both graduate and undergraduate enrollments in cross-campus videoseminars. The HSC seminars will continue with course credit in coming years, and a four-campus minor is proposed by the faculty involved that will expand the scope of the current UCLA minor in Human Complex Systems.

III. GRADUATE TRAINING

A. Ph.D. and M.A. Students

Working with the faculty of the Institute are 56 Ph.D. students, of whom 17 advanced to candidacy during the year. They are listed in Appendix F. Of these, the following students were enrolled in the Ph.D. program in Mathematical Behavioral Sciences during the current academic year:

Dan Cavagnaro
Steve Doubleday
Brendan Purdy
Amy Escobar
Rolf Johnson
Joel Schwarzbart
Alex Strashny
Laurent Tambayong
Nathan Westbrook

In addition, 1 student will join the program in the Fall.

During the year, the Institute continued a program of recruiting students via a mass e-mail describing our program to the Chairs and Graduate Advisors of the major colleges and universities in the country.

Insofar as the Institute's budget allows, students in MBS as well as other students whose research relates to MBS are awarded summer stipends. This past year IMBS received 15 proposals requesting summer funds, and of those, the following 15 students were awarded funds in varying amounts:

Anna Bargagliotti – Mathematics
James Bono – Economics
Dan Cavagnaro – IMBS
Amy Escobar – IMBS
Steven Kies – Cognitive Sciences
Vimal Kumar – Economics
Lingfang "Ivy" Li – Economics
Iris Lien – Economics
Brendan Purdy – IMBS
Jay Simon – Graduate School of Management
Rory Smead – Logic and Philosophy of Science
Jared Smith – Cognitive Sciences
Laurent Tambayong – IMBS
Hisaaki Tabuchi – Cognitive Sciences
Kevin Zollman – Logic and Philosophy of Science

A condition of the support is that the student gives a talk during the academic year on his/her research. Below are the students who received support in the summer of 2005 and their topics:

Hao Jia – **"**Understanding the Heteroskedasticity consistent covariance matrix estimators: A Bayesian approach"
Dan Cavagnaro – "Projection of a Medium"
Rory Smead – "Local interaction and n-player cooperation"

Yogesh Uppal – "Regression discontinuity design"

Jared Smith – "Multinomial processing tree models"
Laurent Tambayong – "The effects of limited information theory in a stylized network formation model"
Lingfang (Ivy) Li – "Cooperation, trust, and social network"
Amer Aladhad – "Economic theories"
James Bono – **"**Heterogeneous Risk and initial wealth in promotion contests"

B. Graduate Advisory Council

This is the third year since the formation of the IMBS Graduate Advisory Council. The Council's purpose is to foster interaction between graduate students in research areas similar to MBS.

This past year the IMBS Graduate Council organized student meetings with colloquia speakers. This gave students an opportunity to interact and network with professors. They also conducted surveys of four graduate classes. The hope is to gain some insight into how students perceive IMBS and how to facilitate more involvement of the social science student body. The Council also cooperated with other graduate students in putting on the 4th Annual Graduate Student Conference. The conference agenda can be found in Appendix G.

Council Members:
Garret Asay (Co-Chair) - Economics
Dan Cavagnaro - IMBS
Amjad Toukan (Co-Chair) - Economics
James Bono - Economics

IV. COMMUNICATION

A. Conferences

This past year the IMBS held conferences on various topics. They are each listed here along with a brief synopsis and the agenda:

"SPATIAL VOTING: Choice Over Multidimensional Issues", December 9-11, 2005.
Spatial voting refers to the study of voting over multi-dimensional issue or policy spaces. Applications of spatial voting include the study of roll call votes in the U.S. Congress, committee decision-making, political party competition, and voting in multi-judge courts, such as the U.S. Supreme Court. Many of the basic issues in these areas require the use of various forms of mathematics to identify and resolve several subtle problems. As such, this was a most appropriate conference to be hosted by the IMBS.

"SPATIAL VOTING: CHOICE OVER MULTIDIMENSIONAL ISSUES
December 9-11, 2005

Friday, December 9

1:00- 1:15 Opening Comments by Donald Saari

1:15- 2:00 JOSEPH GODFREY, WinSet Group, LLC, "*A Tour of Spatial Voting Models Using CyberSenate"*

2-00- 2:15 Guillermo Owen, Discussant

2:15- 3:00 NICHOLAS MILLER, Univ. of Maryland, Political Science, *"In Search of the Uncovered Set"*

3-00- 3:15 Guillermo Owen, Discussant

3:15-3:30 BREAK

3:30-4:15 CRAIG TOVEY, Georgia Tech, Industrial and Systems Engineering, "*The Yolk's on US"*

4:15- 4:30 Jim Adams, Discussant

4:30- 5:15 ELIZABETH PENN, *Harvard Univ., Dept. of Government,* **"*The Legislative Calendar"***

5:15- 5:30 Jim Adams, Discussant

Saturday, December 10

9:00- 9:45 TIM GROSECLOSE, UCLA, Dept. of Political Sciences, *"Gatekeeping"*

9:45-10:00 Sam Merrill, Discussant

10:00-10:45 DONALD CAMPBELL, William & Mary Univ. Dept. of Econ., *"A Strategy-proofness characterization of generalized Weighted Voting"*

10:45-11:00 Sam Merrill, Discussant

11:00-11:15 BREAK

11:15-12:00 SCOTT FELD, Purdue Univ., Dept. of Sociology, and BERNARD GROFMAN, UCI, Political Science, *"Implications of Issue Salience for Political Competition"*

12:00-12:15 Tommy Ratliff, Discussant

12:15- 1:30 LUNCH

1:30- 2:15 CHARLES PLOTT, Caltech, Humanities and Social Science, *"Committee Processes as Information Aggregation, Mechanisms: Experimental Results"*

2:15- 2:30 Tommy Ratliff, Discussant

2:30- 3:15 DONALD SAARI, UCI, Director, Institute for Mathematical Behavioral Sciences; Dept. of Math & Econ, *"Finessing the core: A new solution concept"*

3:15- 3:30 John Patty, Discussant

3:30- 3:45 BREAK

3:45- 4:30 **ITAI SENED**, Washington Univ., Dept. of Political Sciences, *"Uncovering Minority Power Under Majority Rule"*

4:30-4:45 John Patty, Discussant

Sunday, December 11 - 9:00-11:00 General Discussion

"THE EVOLUTION OF NORMS", January 27-28, 2006.

Norms govern much of what we do. But whether social, behavioral, legal, or even biological, how do they evolve? These questions were explored during this conference and mathematics was used to provide insight and to answer pressing problems from the social and behavioral sciences.

CONFERENCE ON "THE EVOLUTION OF NORMS"

January 27 & 28, 2006

Friday, January 27

1:00-1:10 Opening Comments by Donald Saari

Session Chair--Walter Fitch, UCI Professor, Ecology and Evolutionary Biology

1:10-2:00 SIMON LEVIN, George M. Moffet Prof. of Biology, Princeton, *"The Emergence of Collective Decision-making"*

2:00-2:10 Discussion

2:10-3:00 **PAUL EHRLICH, Bing Prof. of Population Studies, Stanford, *"Two Approaches to Cultural Evolution"***

3:00-3:10 **Discussion**

3:10-3:30 **Break in SSPA 2142**

3:30-4:20 **STEVE FRANK, Prof. of Ecology and Evol. Biology, UC Irvine, *"Repression of Competition and the Evolution of Cooperation"***

4:20-4:30 **Discussion**

Saturday, January 28

9:00-9:50 **NATALIA KOMAROVA, Assistant Prof. of Mathematics, UC Irvine, *"Evolution and Learning of Language"***

9:50-10:00 **Discussion**

10:00-10:50 **ERIC MASKIN, Albert O. Hirschman Prof. of Soc. Science, Institute for Advanced Studies, Princeton, *"Evolution and Repeated Games"***

10:50-11:00 **Discussion**

11:00-11:20 **Break in SSPA 2142**

11:20-12:10 **JONATHAN BENDOR, Walter and Elise Haas Prof. of Political Economics, Stanford, *"Ascriptive vs. Universalistic Norms"***

12:10-12:20 **Discussion**

12:20-2:00 **LUNCH**

2:00-2:50 **BRIAN SKYRMS, UCI Distinguished Professor of Logic and Philosophy of Science, UC Irvine, *"Learning to Signal"***

2:50-3:00 **Discussion**

3:00-3:20 **Break in SSPA 2142**

3:20-4:10 **ALLAN GIBBARD, Richard B. Brandt Distinguished University Professor of Philosophy, Univ. of Michigan, *"Norms for Guilt and Moral Concepts"***

4:10-4:20 **Discussion**

"MATHEMATICAL ECONOMICS: WHAT'S NEXT?", May 12-14, 2006.
Some have even asserted that, for various reasons, the area of mathematical economics is not reaching its promise. This conference, which brought in several of the experts in this field, explored new directions and opportunities for mathematical economics.

Conference on "Mathematical Economics: What's Next?"
May 12, 13, & 14, 2006

Friday, May 12

1:00 – 1:30 Opening Comments by Donald Saari, Director of IMBS

1-30 – 2:30 Mordecai Kurz, Professor of Economics, Stanford, *"On Market Risk Premia"*

2:30 – 2:45 Discussant – Ted Bergstrom, Professor of Economics, UC Santa Barbara

2-45– 3:00 BREAK in SSPA 2142

3:00 – 4:00 Mark Satterthwaite, Prof. of Strategic Mgmt., Northwestern Univ., *"How Can Mathematical Economics Help Us Understand the Dynamic Behavior of Industries?"*

4:00 – 4:30 Discussant – Ted Bergstrom, Prof. of Economics, UC Santa Barbara

4:30 – 5:00 Hongkai Zhao, Professor of Mathematics, UC Irvine *"Views on mathematical techniques that may be valuable"*

Saturday, May 13

9:00 –10:00 John Ledyard, Humanities & Soc. Sci.Caltech, *"Dynamics and Non-Convexities"*

10:00 – 10:15 Discussant

10:15 – 10:30 BREAK in SSPA 2142

10:30 – 11:30 Mark Machina, Professor of Economics, UC San Diego, *"Objective Risk Preferences Implied by Attitudes Towards Ambiguity"*

11:30 – 11:45 Discussant

11:45 – 1:30 LUNCH

1:30 – 2:30 William Zame, Professor of Economics, UCLA, *"Markets with Hidden Information and Hidden Actions"*

2:30 – 2:45 Discussant – Charles Plott, Edward S. Harkness Professor, Economics & Political Science, Caltech

2:45 - 3:00 BREAK in SSPA 2142

3:00 – 4:00 Ivar Ekeland, Pacific Institute of Math. Sciences, Univ. of British Columbia *"Are We Asking the Right Questions?"*

4:00 – 4:15 Discussant – Charles Plott, Edward S. Harkness Professor, Economics & Political Science, Caltech

4:15 – 5:15 Donald Saari, Distinguished Prof. of Econ. & Math. and Director of IMBS, UC Irvine, *"Parts, Whole, and Evolution".*

4th ANNUAL GRADUATE STUDENT CONFERENCE, May 26, 2006.

This yearly conference brings together Ph.D. students from various disciplines. It gives students a chance to report on their current research areas and to share ideas.

The Fourth Annual Graduate Student Conference on Social Choice and Behavioral Sciences
May 26, 2006 -- Social Science Plaza A, room 2112

Session 1: Chair - Amjad Toukan

9:00 – 9:30 James Bono, Department of Economics, *"The Core of Cores"*

9:30 – 10:00 Hoa Jia, Department of Economics, *"On Group Self-Governance"*

10:00 – 10:30 Hyeok Ki Min, Department of Economics, *"Contest for Trade Policy"*

Session 2: Chair - Jason Kronewetter

10:45 – 11:15 Dan Cavagnaro, Department of Mathematical Behavioral Sciences, *"A Random Walk Model for the Evolution of Preferences"*

11:15 – 11:45 Ivy Li, Department of Economics, *"Dynamic Game among Traders in Online Commerce Market"*

11:45 – 12:15 Amy Escobar, Department of Mathematical Behavioral Sciences, *"Modeling face processing: Eigenfaces, a fragment-based approach and a new dimension"*

Session 3: Chair - Anna Bargagliotti

1:30 – 2:00 Nathan Fiala, Department of Economics, *"Economic and Environment Impact of Meat Consumption"*

2:00 – 2:30 Jay Simon, Operations and Decision Technologies Paul Merage School of Business, *"Prostate Cancer Decision Analyst: Choosing the Best Treatment"*

2:30 – 3:00 Vimal Kumar, Department of Economics, *"Product Cycle, Growth and Wage Inequality in a Closed Economy"*

Session 4: Chair - Garrett Assay

3:15 – 3:45 **Brendan Purdy, Mathematical Behavioral Sciences, *"Measuring the Sensory Order"***

3:45 – 4:15 **John Pyles, Department of Cognitive Sciences, "Brain activity evoked by perception of novel 'biological motion"**

4:15 – 4:45 **Ling Lin, Department of Cognitive Sciences, "Visual Sensory Memory: The Contrast of Visual Gratings"**

B. Conferences/Seminars organized by IMBS Members

William Batchelder

Organized with Professor Xiangen Hu of the University of Memphis a Symposium titled "Cognitive Psychometrics" at the Annual meeting of the Society for Mathematical Psychology, Memphis, TN., August 2005.

David Brownstone

Conference on Urban and Transportation Economics to honor Kenneth Small (with J. Brueckner, A. Glazer, and K. VanDender), UCI, February, 2006.

Chancellor's Fellow Distinguished visit of Prof. Jagdish Bhagwati (with W. Schonfeld), UCI, April, 2006.

Carter Butts

Co-organizer, Statnet Workshop, held at the 26th Sunbelt Network Conference (INSNA), Vancouver, BC, 2006.

Barbara Dosher

Organizing Committee: Eighth Conference on the Neurobiology of Learning and Memory: Memory and the Brain: Basic Mechanisms and Clinical Implications. March 11-14, 2006.

Michelle Garfinkel

Herschel Grossman's Memorial Conference, Brown University, April 2006.

Ami Glazer

Conference Politics of Special Interests, February 2006.

UCI Conference on Urban and Transportation Economics to honor Kenneth Small (with J. Brueckner, A. Glazer, and K. VanDender), February, 2006.

Bernard Grofman

Conference on Spatial Social Choice, by IMBS and the Center for the Study of Democracy (co-organized with Donald Saari), December 9-11.

Conference on Plurality and Runoff Methods in Canada, United States and United Kingdom (Canadian Embassy, $5,000, CSD supplemental funding, $5,000; with Shaun Bowler), February 17-20, 2006.

Louis Narens

Symposium for the Annual Mathematical Psychology Meeting, co-organzied another for the Annual Meeting of the International Society for Psychophysics, and gave presentations at both meetings.

George Sperling

31st Annual Interdisciplinary Conference, Jackson, WY, February 5-10, 2006.

Doug White

ECCS06 Satellite Workshop on Social and Historical Dynamics: Emergence, Robustness, Resilience, and Coevolution. European Complexity Conference, partial funding by the James Martin Institute for Science and Civilization. Oxford 2006.

Human Sciences and Complexity (UC-HSC) Multicampus Videoseminar Series, 2005-2006.

Hongkai Zhao

Program Committee of the 3rd IEEE Workshop on Variational, Geometric and Level Set Methods in Computer Vision, held in conjunction with the 10th International Conference in Computer Vision, Beijing, China. October 2005.

International Conference on Multiscale Methods and Partial Differential Equations, UCLA. August 2005.

Invited Minisymposium on Level Set Methods and Inverse Problems, SIAM annual meeting, New Orleans. July 2005.

C. Future Conferences

The Institute is planning at least two conferences next year: *"Evolutionary Processes"*, to be held in January, and a second conference on *"Sports, Decisions, and Rankings"*, to be held in February.

D. Visitors

The Institute hosted 5 visitors during the year. Some of their letters can be found in Appendix H.

Janós Aczél
Department of Pure Mathematics
University of Waterloo
Waterloo, Ontario, Canada

Kimberly Jameson
IMBS Visiting Specialist

Anthony A. J. Marley
Department of Psychology
McGill University

Verena Schmittman
Ph.D. Student in Psychology
University of Amsterdam
The Netherlands

Eric-Jan Wagenmakers
Department of Psychology
University of Amsterdam
The Netherlands

Next year the Institute will sponsor the visit of Professor Simon Levin, Moffett Professor of Biology and Director of the Center for BioComplexity at Princeton University.

E. Colloquia Series

During the academic year the Institute conducts a colloquia series with speakers both from inside as well as outside the Institute. For speakers outside California, we attempt, insofar as possible, to coordinate their visit with other travel to California. Some speakers are brought here jointly with UCLA's Marschak Colloquium where the speaker first talks at UCI on a Thursday and at UCLA on the following day. We distribute a relevant paper, when available, prior to each colloquium. Most papers are also downloadable from the IMBS web site at www.imbs.uci.edu.

The focus group in Social Dynamics and Evolution also held regular colloquia and these events are listed on their web site at http://eclectic.ss.uci.edu/ResFocusGrp.

Listed below are the IMBS colloquia as well as those in Social Dynamics and Evolution.

FALL COLLOQUIA SERIES

October 6
JOHN MORGAN, Haas School of Business and Department of Economics, *"Clock Games: Theory and Experiments".*

October 13|
DETLOF VON WINTERFELDT, Public Policy and management: Director Center for Risk and Economic Analysis of Terrorist Events, USC, *"Decision and Risk Analysis to Counter Terrorism".*

October 20
RICHARD YOUNG, General Motors, Human Vehicle Integration Core Group, *"Where is Color"?*

October 27
HAL STERN, Department of Statistics, UC Irvine, *"Bayesian Statistics for Experimental Scientists: ANOVA Examples".*

November 10
JACK YELLOTT, Cognitive Sciences, UC Irvine, *"Correcting Spurious Resolution".*

November 17
JAMES HONAKER, Department of Political Science, UCLA, *"The Ecology of Preference".*

December 1
WILLIAM ZAME, Department of Economics, UCLA, *"Asset Pricing in the laboratory".*

WINTER COLLOQUIA SERIES

January 12
KATIE FAUST, Department of Sociology, UC Irvine, *"Very Local Structure in Social Networks".*

January 19
PATRICK SUPPES, Department of Philosophy, Stanford University, *"A Theory of Rational Choice Based on Habits and Associations Rather Than Preferences".*

January 20
EDUARDO ZAMBRANO, Department of Finance, Notre Dame, *"An Impossible Trinity for Interactive Epistemology".*

January 26
LRICH SCHMIDT, Department of Financial Economics, Univ. of Hannover, *"Reference Points and Loss Aversion".*

February 2
ERIC JAN WAGENMAKERS, Department of Psychology, Univ. of Amsterdam, *"A Statistical Perspective on the Peculiar Properties and Pervasive Problems of p-Values".*

February 13
MICHEL REGENWETTER, Department of Psychology and Political Science, Univ. of Illinois, *"*Tversky's *Intransitivity of Preference* Revisited*".*

February 23
ANTHONY MCGANN, Department of Political Science, UCI, *" Proportional Representation Within the Limits of Liberalism Alone".*

March 2
GEORGE SPERLING & JIAN DING, Department of Cognitive Sciences, *"How the two eyes combine information: A neurally-plausible mathematical theory and some supporting evidence".*

SPRING 2005

April 13
MICHAEL LAMPORT COMMONS, Department of Psychiatry, Harvard Medical School, *"Hierarchical Complexity and Approximate G".*

April 20
STEPHEN MORRIS and HYUN SONG SHIN, Department of Economics, Princeton University, *"Coordination without Common Knowledge".*

April 27
NATALIA KOMAROVA, Department of Mathematics, UCI, "*Cancer as somatic evolution".*

May 4
JOEL SOBEL, Department of Economics, UCSD, *"Information Aggregation and Group Decisions".*

May 11
DONALD HOFFMAN, Department of Cognitive Sciences, UC Irvine, *"Perception, Evolution, and the Mind Body Problem".*

May 18
JAMES FOWLER, Department of Political Science, UC Davis, *"Network Analysis and the Law: Measuring the Legal Importance of Supreme Court Precedents".*

May 25
DUNCAN WATTS, Department of Sociology, Columbia University, "*Dynamic Network Analysis of a University Community".*

June 1
JOHN BOYD, Department of Anthropology, UCI, *"The census of signed, directed triads using the Polya enumeration theorem".*

June 8
NOAH FRIEDKIN, Department of Sociology, UC Santa Barbara, *"Social Influence Network Theory".*

SOCIAL DYNAMICS AND EVOLUTION COLLOQUIA

September 30
DOUG WHITE, UC Irvine Department of Anthropology, "*Civilizations as dynamic networks : Cities, hinterlands, populations, industries, trade and conflict"*

October 14
CHRIS CHASE-DUNN, Department of Sociology, UC Riverside, *"Rise, fall and upward sweeps: the emergence of a global state".*

October 28
DWIGHT READ, Professor of Anthropology, UCLA, *"The Evolution of Cultural Kinship: A non-Darwinian Odyssey".*

November 4
DARREN SCHREIBER, Assistant Professor of Anthropology, UCLA, *Humans are by nature political animals: New evidence and arguments.*

January 13
XIAOYI JIN, **DU HAIFENG, and SHUZHUO** LI, *"Network Study of Rural-Urban Migration in China***".**

February 3
HENRY WRIGHT, Department of anthropology, University of Michigan, **"***Recent Research on Mesopotamian State Emergence".*

February 10
MICHALIS FALOUTSOS, UC Riverside Computer Science, "*Network Models of Internet and Industry*".

February 24
ADAM KUPER, Professor of Anthropology, Brunel University, London, "*Structural endogamy in European educated bourgeoisies*".

March 10
MIKE AGAR, International Institute for Qualitative Methodology, University of Alberta "*Telling It Like It (Subjunctively) Is: Organizational Complexity, Linguistic Anthropology, and Narrative*"

March 30
ART GRIFFIN, UCLA, and **CHARLES STANISH**, UCLA Cotsen Institute of Archaeology Director "*A simulation model of Lake Titicaca Basin settlement patterns circa 2500 BC - AD 1000" and* **PAUL JORION**, UCLA, "*Adam Smith's 'Invisible hand' revisited: A simulation".*

April 7
STEVEN BANKES, Evolving Logic Inc, Rand Pardee School, UCLA Human Complex Systems, "*Computational Exploration in Long Term Policy Analysis for Social and Organizational Complex Systems"*

April 21
TSUTOMU (TOM) NAKANO, Kwansei Gakuin University/External Affiliated Faculty, Center on Organizational Innovation, Columbia University, and **DOUG WHIT**E, IMBS, UCI "Networks-Affect-Pricing Theory in Modern Production Industry: Three Network Studies of the Giant Industrial District of Tokyo".

May 5
JEAN ENSMINGER, Department of Anthropology, Cal Tech, "The Co-Evolution of Pro-Social Norms and the Market".

May 19
DARREN SCHREIBER, Political Science, UCSD, "The Emergence of Parties: An Agent-Based Simulation".

V. BUDGET

A. Appropriations and Expenditures

Appropriations:

IMBS 2005-06 Budget allocation	$100,597
IMBS 2004-05 Carry Forward	$ 61,252
Conference Support	$ 2,000
Donation	320
Total budget for 05-06	**$164,169**

Expenditures:

Salaries (Director, Staff)	$ 47,708
School Administrative Support	$ 7,500
Conference/Colloquia	$ 29,431
Equipment	$ 616
Supplies & Expenses	$ 5,365
Graduate Student Support	$ 1,000
Total Expenditures:	**$ 91,620**

Carry Forward to 2006-07 ***$72,549***

2006-07 Encumbrances:

Graduate Student Support	$20,000
Administrative support	$ 7,500
Conference/Colloquia	$35,000
Equipment	$10,000

B. Extramural Funding Activity

IMBS faculty research was supported by 42 research grants. At present, 5 individual grants are pending. Following is a detailed breakdown of the extramural funding.

GRANTS AWARDED AND ACTIVE:

PI	Source	Amount	Dates
Batchelder	NSF	$300,000	7/02-6/06
*Research in the Foundations and practice of Social measurement, w*ith A. K. Romney			
Batchelder	NSF	$240,000	7/05-6/06
Multinomial processing Tree Models: New projects and Implementations, with Xiangen Hu			
Batchelder	Alzheimer's Assoc.	$ 185,000	2/03-1/06
Developing Culturally Appropriate Screening Tools for Dementia, with E. Batchelder			
Birnbaum	APA	$24,000	7/05-6/06
Advanced Training Workshops.			
Birnbaum	NSF	$99,324	7/00-6/06
Judgement and Decision-making on the Internet.			
Brown/Steyvers	AFRL/AFOSR	$380,000	7/03-6/06
Inference in Dynamic Environments: An empirical and theoretical investigation into dynamic decision making environments.			
Brownstone	CA. Dept. of Trans.	$133,000	9/04-12/05
Evaluation of Incorporating Hybrid Vehicle Use of HOV Lanes, with W. Recker and T. Golub.			
Brownstone	CA. Dept. of Trans.	$161,150	6/06-9/07
Extension of Hybrid HOV Lane Microsimulation Model to Incorporate: 1) HOT Lanes and 2) Non Buffer-separated Part-time HOV Lanes", with W. Recker and T. Golob.			
Brownstone	NSF	$550,000	10/05-9/08
AOC: Globalization and Offshore Sourcing of Knowledge Work: Economic, Relational and ICT Dynamics, with K. Kraemer, et. al.			
Butts	NSG ITR	$8, 957,651.00	10/03-9/08
Collaborative Research: Responding to the Unexpected. Mehrotra, Sharad (PI); Butts, Carter T. (Co-PI); Eguchi, Ronald (Co-PI); Venkatasubramanian, Nalini (Co-PI); and Winslett, Marianne (Co-PI).			

Butts NSF CHE $69,372 2/06-1/07
SGER: Collaborative Research: Mapping and Analyzing Emergent Multiorganizational Networks in the Hurricane Katrina Response.

Chubb NSF $300,003 8/03 – 7/06
Semantic Biological Image Management and Analysis. Co-PIs: P. Sheu, C. Cotman.

Chubb NINDS $688,560 9/03 – 5/08
Effects of Temporal Lobectomy on Sensory Deficits in TLE. PI A. Grant. Co-PIs C. Chubb, G. Hickok, F-G Zeng.

Chubb NSF $300,003 8/03 – 7/06
Semantic Biological Image Management and Analysis. CoPI's: P. Sheu, C. Cotman, C. Chubb

Dosher NIH $1,600,000 6/06
Functions and Mechanisms of Perceptual Learning

Keller NSF & U. of AZ $6,900,000 9/04-8/09
Decision Center for a Desert City. Serve on decision research team with Craig Kirkwood, Don Keefer, and Bill Verdini of ASU.

Komarova NIH $299,564 7/05-6/10
Specificity and spatial dynamics of cell signaling: theory and experiment

Komarova NIH $299,564 7/05-6/11
Mathematical modeling of programmed CT proliferation

Komarova Sloan Fellowship $45,000 7/05-6/06
Cancer cell research

Luce NSF $215,000 4/05-3/08
Algebraic and Stochastic Models of Structures arising in Utility Theory and Psychophysics

McBride Ctr. for Study of Democracy $2,000 2/06-3/07
Conflict and the Shadow of the Future, with S. Skaperdas

Saari NSF $100,000 8/06-7/08
SGER / Collaborative Reseach: Multiscale Modeling: Finding Strengths, Avoiding Weaknesses

Saari NSF $300,000 9/06-9/09
A Mathematical Foundation for Voting and Decision

Skaperdas CSD & GPACS $3,500 05-06
Globalization and Conflict, with M. McBride

Skaperdas CSD & GPACS $4,000 06-07

Conflict and the Shadow of the Future, with M. McBride

Small UC Energy Institute. $ 35,000 7/05-6/06
The Impact of Transportation Fuel Conservation Strategies in California

Sperling AFO: Scientific. Res. $438,624 4/04-12/06
Deriving a Computational Theory of Visual Spatial Attention.

Sperling NIH $1,459,618 11/03-12/06
Dynamic Neuroimaging.

Srinivasan NIMH $1,473,000 4/04-12/05
Dynamic Neuroimaging with high-resolution SSVEPs

Stern NIH - NCRR $25,000,000 10/05-9/09
Functional Imaging Research on schizophrenia Testbed. Chair of Statistics Working Group; S. G. Potkin (PI))

Steyvers NSF-DARPA-NSA $300,000 7/06 – 6/07
Entity-Topic Modeling, Querying, and Analysis. PI (Smyth). Role: Co-I

Steyvers NSF-ARMY $120,000 7/06 – 6/07
Online Topic Extraction and Change Detection from Massive Multilingual Text Streams. PI (Smyth). Role: Co-I

Steyvers NSF-DARPA-NSA $762,000 7/02 – 6/06
Entity-Based Data Mining from Spatiotemporal and Text-Based Data Streams. Co-PI with P. Smyth

White EU Grant $10,000 1/02-12/05
*Society as a Complex System (*PIs on the main grant are Profs. Sander van der Leeuw, David *Lane and Geoffrey West (sub-contract component).*

White Agency National de Recherche (France) 150,000 euro 1/06-12/08
Informatic Treatment of Kinship Phenomena: An Integrated Approach in Anthropology and History

Xin NSF/ITR $452,536 9/02-8/06

Xin NSF/DMS $105,000 9/05-8/08

Xin Ctr. for Hearing Research - UCI $4,000 2/06-3/07

Xin UCI Multi-Investigator Res. Grant (CORCL) $17,593 7/06-8/07

Zhao ONR $560,000 2/06-11/09
Time Reversal and Imaging in a Multiscale Environment and Applications to Imaging and Communications.

Zhao DARPA $840,000 5/06-2/09
Time Reversal and Imaging in a Multiscale Environment and Applications to Imaging and Communications. (Co-PI, Phase II)

Zhao NSF $180,000 7/05-7/08
Efficient numerical methods for material transport on moving interface and Hamilton-Jacobi equations.

INDIVIDUAL PROPOSALS PENDING

Butts NSF HD $749,999
AOC: Improvisation in Emergency Response: Linking Cognition, Behavior and Social Interaction. Mendonca, David; Butts, Carter T.; and Webb, Gary

Hoffman McDonnell $445,988
Perception, evolution, and the mind-body problem

Grofman Canadian Embassy $5,000
Economic Growth and the Production of Spiritual Capital (with $5,000 supplemental funding from UCI Center, with Stergios Skaperdas)

Komarova NIH
Experimentally validated mathematical modeling of oncolytic virus infection

McBride U.S. Instit. of Peace $43,710
Conflict and the Shadow of the Future: An Experimental Study

VI. APPENDICES

APPENDIX A
CURRENT FACULTY MEMBERS

MEMBERS

Aldo Antonelli, (Ph.D Philosophy, University of Pittsburgh). Professor of Philosophy, University of California, Irvine. Research areas: knowledge representation an non-monotonic reasoning, non-standard set theories, especially Quine's "New Foundations", logical foundations of game theory and applications to distributed artificial intelligence.

Pierre F. Baldi, (Ph.D. Mathematics, California Institute of Technology). Professor, Information and Computer Science, Director of the Institute for Genomics and Bioinformatics. Research areas: Bioinformatics/Computational Biology, Probabilistic Modeling/Machine Learning.

Jeffrey Barrett, (Ph.D. Philosophy, Columbia University). Professor of Philosophy, University of California, Irvine. Research areas: philosophy of science and the theory of knowledge, philosophy of physics.

William H. Batchelder, (Ph.D. Psychology, Stanford University). Professor of Cognitive Sciences, University of California, Irvine. Research areas: Mathematical modeling and measurement methodology in the social and behavioral sciences.

Michael H. Birnbaum, (Ph.D. Psychology, University of California, Los Angeles). Professor of Psychology, California State University, Fullerton. Research areas: Human judgment, decision-making, and utility measurement.

John P. Boyd, (Ph.D. Communication Sciences, University of Michigan). Professor of Anthropology, University of California, Irvine. Research areas: Algebraic models of social relations, quantitative methods, and sociobiology.

Myron L. Braunstein, (Ph.D. Psychology, University of Michigan). Professor of Psychology, University of California, Irvine. Research areas: Visual perception, especially depth and motion perception.

William Branch, (Ph.D. Economics, University of Oregon). Assistant Professor of Economics, University of California, Irvine. Research areas: Macroeconomics, economic theory.

Scott Brown, (Ph.D. Mathematics, University of Newcastle). Assistant Professor of Cognitive Sciences. Research areas: Mathematical models of reaction time and practice.

David Brownstone, (Ph.D. Econometrics and Applied Microeconomics, University of California, Berkeley). Professor of Economics, University of California, Irvine. Research areas: Computer-intensive analysis of statistical estimation strategies and applied econometrics.

Michael L. Burton, (Ph.D. Anthropology, Stanford University). Professor of Anthropology, University of California, Irvine. Research areas: Economics anthropology, cognitive anthropology, and cross-cultural research methods.

Carter Butts, (Ph.D. Sociology, Carnegie Mellon University). Assistant Professor of Sociology. Research areas: Computational and Mathematical Organization Theory, Games and Economic Behavior.

Linda Cohen, (Ph.D. Social Sciences, California Institute of Technology). Professor of Economics, University of California, Irvine. Research areas: Political economy, public choice, and governmental regulation of business.

Charles Chubb, (Ph.D. Experimental Psychology, New York University). Professor of Psychology, University of California, Irvine. Research areas: neural networks, perceptual learning, visual coding, visual short-term memory, and human choice behavior.

Rui De Figueiredo, (Ph.D. Applied Mathematics, Harvard University). Professor of Electrical and Computer Engineering and Mathematics, University of California, Irvine. Research areas: Mathematical foundations of neural networks, contextual feedback models for automated image understanding.

Barbara Dosher, (Ph.D. Experimental Psychology, University of Oregon). Professor of Cognitive Sciences, University of California, Irvine. Research areas: Memory, visual perception, and depth from visual motion.

Michael D'Zmura, (Ph.D. Psychology, University of Rochester). Professor of Cognitive Sciences, University of California, Irvine. Research areas: Visual perception, color, image understanding, and attention.

Jean-Claude Falmagne, (Ph.D. Psychological Sciences, University of Brussels). Professor of Cognitive Sciences, University of California, Irvine. Research areas: Assessment of knowledge, measurement theory, psychophysics, and mathematical psychology.

Katherine Faust, (Ph.D. Social Science, University of California, Irvine). Professor of Sociology, University of California, Irvine. Research areas: Social Networks, research methods.

Linton C. Freeman, (Ph.D. Sociology, Northwestern University). Research Professor of Social Sciences, University of California, Irvine. Research areas: Cognition of social structure, social networks.

Michelle Garfinkel, (Ph.D. Economics, Brown University). Professor of Economics, University of California, Irvine. Research areas: Strategic aspects of Monetary and Fiscal Policies.

Amihai Glazer, (Ph.D. Economics, Yale University). Professor of Economics, University of California, Irvine. Research areas: Public Choice, especially concerning commitment problems.

Bernard Grofman, (Ph.D. Political Science, University of Chicago). Professor of Political Science and Social Psychology, University of California, Irvine. Research areas: Models of group decision making, models of individual choice, electoral competition.

Donald Hoffman, (Ph.D. Computational Psychology, Massachusetts Institute of Technology). Professor of Cognitive Sciences and Information and Computer Science, University of California, Irvine. Research areas: Formal theories of perception, human and machine vision, recovery of depth from images.

Tarow Indow, (Ph.D. Psychology, Keio University, Tokyo). Professor Emeritus of Cognitive Sciences, University of California, Irvine. Research areas: Quantitative analysis and mathematical models in space perception, color perception, and retrieval from long-term memory.

Geoffrey Iverson, (Ph.D. Theoretical Physics, University of Adelaide, Australia; Ph.D. Experimental Psychology, New York University). Professor of Cognitive Sciences, University of California, Irvine. Research areas: Psychophysics, statistical estimation/testing of ordinal models.

L. Robin Keller, (Ph.D. Management Sciences, University of California, Los Angeles.) Professor of Administration and Social Sciences, Graduate School of Management, University of California, Irvine. Research areas: Individual decision-making, risk analysis, decision problem structuring.

Natalia Komarova, (Ph.D. Applied Mathematics, University of Arizona), Assistant Professor, Department of Mathematics and Ecology & Evolutionary Biology. Research areas: Mathematical modeling and biology, virus dynamics, cancer modeling.

Vladimir A. Lefebvre, (Ph.D. Psychology, Lomonosov Moscow State University). Researcher for Cognitive Sciences, University of California, Irvine. Research areas: Human reflexion, mathematical modeling of human inner world, military psychology.

R. Duncan Luce, (Ph.D. Mathematics, Massachusetts Institute of Technology). Distinguished Research Professor of Cognitive Sciences, and Research Professor of Economics, University of California, Irvine. Research areas: Axiomatic theories of measurement, probabilistic choice and response time models, individual decision making.

Mark J. Machina, (Ph.D. Economics, Massachusetts Institute of Technology). Professor of Economics, University of California, San Diego. Research areas: Utility, decision making, risk behavior.

Penelope Maddy, (Ph.D. Philosophy, Princeton). Professor of Logic and Philosophy of Science, University of California, Irvine. Research areas: Philosophy of mathematics, especially the philosophy of set theory.

Michael McBride, (Ph.D. Economics, Yale University). Assistant Professor of Economics. Research areas: Microeconomics, game theory, and political economy.

Anthony McGann, (Ph.D. Political Science, Duke University). Assistant Professor of Political Science, University of California, Irvine. Research areas: party systems, democratic theory, formal models of political systems, European government.

Louis E. Narens, (Ph.D. Mathematics, University of California, Los Angeles). Professor of Cognitive Sciences, and Psychiatry and Human Behavior, University of California, Irvine. Research areas: Measurement theory, foundations of science, decision theory.

Dale Poirier, (Ph.D. Economics, University of Wisconsin). Professor of Economics, University of California, Irvine. Research areas: econometrics, both theoretical and empirical, specializing in Bayesian econometrics.

David M. Riefer, (Ph.D. Psychology, University of California, Irvine). Professor of Psychology, California State University at San Bernardino. Research areas: Memory, cognitive science, and mathematical psychology.

A. Kimball Romney, (Ph.D. Social Anthropology, Harvard University). Research Professor of Anthropology, University of California, Irvine. Research areas: Cognitive anthropology, cultural consensus, quantitative methods.

Donald G. Saari, (Ph.D. Mathematics, Purdue University). Distinguished Professor of Mathematics and Economics, University of California, Irvine. Research areas: Mathematics and application of dynamical system to social sciences; decision theory.

Stergios Skaperdas, (Ph.D. Economics, Johns Hopkins University). Professor of Economics, University of California, Irvine. Research areas: Bargaining models, applications of non-cooperative game theory, bilateral exchange.

Brian Skyrms, (Ph.D. Philosophy, University of Pittsburgh). Professor of Philosophy, University of California, Irvine. Research areas: Probability, induction, causation, rational choice.

Kenneth Small, (Ph.D. Economics, University of California, Berkeley). Professor of Economics, University of California, Irvine. Research areas: Urban economics, transportation economics, discrete-choice econometrics, and energy.

Padhraic Smyth, (Ph.D. Electrical Engineering, California Institute of Technology). Professor, Information and Computer Science, University of California, Irvine. Research areas: Statistical pattern recognition, probabilistic learning, information theory, artificial intelligence, image and time-series modeling.

George Sperling, (Ph.D. Psychology, Harvard University). Distinguished Professor of Cognitive Sciences, University of California, Irvine. Research areas: Human information processing, vision and visual perception, computer vision and image processing.

Ramesh Srinivasan, (Ph.D. Biomedical Engineering, Tulane University). Assistant Professor of Cognitive Sciences, University of California. Research areas: Perception, development and cortical dynamics.

Hal Stern, (Ph.D. Statistics, Stanford University). Professor of Statistics, Department of Statistics, University of California, Irvine. Research areas: Bayesian methods, model diagnostics, statistical computing, applications to biological and social sciences, sports and statistics.

Mark Steyvers, (Ph.D. Psychology, Indiana University). Associate Professor of Cognitive Sciences, University of California, Irvine. Research areas: Computational models of memory, reasoning and perceptions.

Carole Uhlaner, (Ph.D. Political Science, Harvard University). Associate Professor of Political Science, University of California, Irvine. Research areas: Rational actor models and statistical analyses of political behavior, especially participation and voting; decision theory; comparative politics.

Douglas White, (Ph.D. Anthropology/Social Theory, University of Minnesota). Professor of Anthropology, University of California, Irvine. Research areas: Social theory, complexity, evolutionary theory, organization, networks, long-term field studies and social dynamics, world-system impacts on local communities, ethnosociology, comparative studies, quantitative methods; Mexico, Europe.

Charles (Ted) Wright, (Ph.D. Experimental psychology, University of Michigan). Associate Professor of Cognitive Science, University of California, Irvine. Research areas: Acquisition and cognitive representation of human skills, speed-accuracy trade-offs, models for shape of trajectories.

Jack Xin, (Ph.D. Courant Institute, New York University). Professor of Mathematics. Research areas: Partial Differential Equations (PDE), Asymptotic Analysis, Scientific Computation, and their Applications in Fluid Dynamics, Voice Signal Processing, Biology, Nonlinear Optics and Geoscience.

John I. Yellott, Jr. (Ph.D. Psychology, Stanford University). Professor Emeritus of Cognitive Sciences, University of California, Irvine. Research areas: Vision, probabilistic choice models.

Hongkai Zhao, (Ph.D. Mathematics, University of California, Los Angeles). Associate Professor of Mathematics, University of California, Irvine. Research areas: Applied and computational mathematics with applications in physics, engineering, imaging science and computer vision.

APPENDIX B
SCIENTIFIC PUBLICATIONS OF MEMBERS, ACADEMIC 2004-05[1]

Pierre Baldi

C. Azencott, A. Ksikes, S. Joshua Swamidass, J. Chen, L. Ralaivola, and P. Baldi. (2006). One- to Four- Dimensional Kernels for Small Molecules and Predictive Regression of Physical, Chemical, and Biological Properties. *Bioinformatics*, submitted.

Y. Dou, K. Fox-Walsh, P. Baldi, and K. Hertel. Frequent Alternative Splicing Close to Dominant Splice Sites Reveals Imprecision During the Splicing Reaction. Submitted.

Suman Sundaresh, Denise L. Doolan, Siddiqua Hirst, Yunxiang Mu, Berkay Unal, D. Huw Davies, Phil Felgner, and Pierre Baldi. Identification of Humoral Immune Responses in Protein Microarrays using DNA Microarray Data Analysis Techniques. *Bioinformatics*, in press.

M. Brandon, P. Baldi, and D. C. Wallace. Mitochondrial Mutations in Cancer. *Oncogene*, in press.

J. Cheng and P. Baldi. A Machine Learning Information Retrieval Approach to Protein Fold Recognition. *Bioinformatics*, in press.

C. V. Lopes, A. Haghighat, A. Mandal, P. Baldi, and T. Givargis. Localization of Off-the-Shelf Mobile Devices Using Audible Sound: Architectures, Protocols and Performance Assessment. ACM SIGMOBILE Mobile Computing and Communications Review, in press.

C. Tagwerker, K. Flick1, M. Cui, C. Guerrero, Y. Dou, B. Auer, P. Baldi, L. Huang, and Peter Kaiser. A tandem-affinity tag for two-step purification under fully denaturing conditions: Application in ubiquitin profiling and protein complex identification combined with in vivo cross-linking. *Molecular and Cellular Proteomics*, in press.

T. Lin, M. Melgar, S. J. Swamidass, J. Purdon, T. Tseng, G. Gago, D. Kurth, P. Baldi, H. Gramajo, and S. Tsai. (2006). Structure-Based Inhibitor Design of AccD5, an Essential acyl-CoA Carboxylase Carboxyltransferase Domain of *Mycobacterium tuberculosis*. *Proceedings of the National Academy of Sciences USA*, 103, 9, 3072-3077.

G. Pollastri, A. Vullo, P. Frasconi, and P. Baldi. Modular DAG-RNN Architectures for Assembling Coarse Protein Structures. *Journal of Computational Biology*, in press.

J. Cheng, M. J. Sweredoski, and P. Baldi. DOMpro: Protein Domain Prediction Using Profiles, Secondary Structure, Relative Solvent Accessibility, and Recursive Neural Networks. *Data Mining and Knowledge Discovery*. In press.

[1] Those members not listed failed to respond to our request for information.

J. Cheng, A. Randall, and P. Baldi. (2006). Prediction of Protein Stability Changes for Single Site Mutations Using Support Vector Machines. *Proteins*, 62, 4, 1125-1132.

E. T. Wang, G. Kodama, P. Baldi, and R. K. Moyzis. (2006). Global Landscape of Recent Inferred Darwinian Selection for *Homo Sapiens*. *Proceedings of the National Academy of Sciences USA*, 103, 135-140.

J. Cheng, H. Saigo, and P. Baldi. (2006). Large-Scale Prediction of Disulphide Bridges Using Kernel Methods, Two-Dimensional Recursive Neural Networks, and Weighted Graph Matching. *Proteins*, 62, 3, 617-629.

Kristi L. Fox-Walsh1, Yimeng Dou, Bianca J. Lam1, She-pin Hung, Pierre F. Baldi, and Klemens J. Hertel. (2005). The Architecture of pre-mRNAs Affects Mechanisms of Splice-Site Pairing. *Proceedings of the National Academy of Sciences USA,* 102, 16176-16181.

J. Chen, S. J. Swamidass, Y. Dou, J. Bruand, and P. Baldi. (2005). ChemDB: A Public Database of Small Molecules and Related Chemoinformatics Resources. *Bioinformatics*, 21, 4133-4139.

S. A. Danziger, S. J. Swamidass, J. Zeng, L. R. Dearth, Q. Lu, J. H. Chen, J. Cheng, V. P. Hoang, H. Saigo, R. Luo, P. Baldi, Rainer K. Brachmann, and Richard H. Lathrop. Functional Census of Mutation Sequence Spaces: The Example of p53 Cancer Rescue Mutants. *IEEE Transactions on Computational Biology and Bioinformatics*. In press.

D. M. Chung, Y. Dou, P. Bald**i**, and J. S. Nowick. (2005). The Absence of Favorable Aromatic Interactions between Beta-Sheet Peptides. *Journal of the American Chemical Society*,127 (28), 9998-9999.

J. Cheng and P. Baldi. (2005). Three-Stage Prediction of Protein Beta-Sheets by Neural Networks, Alignments, and Graph Algorithms. Proceedings of the 2005 Conference on Intelligent Systems for Molecular Biology, ISMB 05. *Bioinformatics*, 21, Supplement 1, i75-84.

William Batchelder

Alex Strashny, William H. Batchelder, A. Kimball Romney (Accepted). A Cultural Consensus Model for Aggregating Continuous Responses in a Finite Interval. *Journal of Mathematical Psychology.*

Batchelder, W.H., and Riefer, D.M.. Using Multinomial Processing Tree Models to Measure Cognitive Deficits in Clinical Populations, In R. Neufeld (Ed.). *Advances in Clinical Cognitive Science*. Washington, D.C. American Psychological Association Books, in press.

Batchelder, W.H. . Cognitive Psychometrics: Using Multinomial Processing Tree Models as Measurement Tools. S. Embretson and J. Roberts (Eds.) *New Directions in Psychological Measurement with Model Based Approaches*. American Psychological Association Books. To appear.

Batchelder, W.H., and Batchelder, E. Meta-cognitive Guessing Strategies in Source Monitoring. In J. Dunlosky and R.A. Bjork (Eds.). Handbook of Memory and Metacognition. LEA Books. To appear.

John Boyd

Boyd, J.P., William J. Fitzgerald, and Robert J. Beck. (2006). Computing Core/Periphery Structures and Permutation Tests for Social Relations Data. *Social Networks* 28:165–178.

William Branch

Intrinsic Heterogeneity in Expectation Formation, (with George W. Evans) *Journal of Economic Theory*, 2006, 127, 264-295.

A Simple Recursive Forecasting Model, (with George W. Evans). 2006. E*conomics Letters*, 91, 2.

Branch, W. Replicator Dynamics in a Cobweb Model with Rationally Heterogeneous Expectations. Journal *of Economic Behavior and Organization,* forthcoming.

Branch, W. Sticky Information and Model Uncertainty in Survey Data on Inflation Expectations. Forthcoming in *Journal of Economic Dynamics and Control*.

Branch, W. Restricted Perceptions Equilibria and Learning in Macroeconomics. Forthcoming in *Post Walrasian Macroeconomics: Beyond the Dynamic Stochastic General Equilibrium Model*, ed. David Colander, Cambridge University Press.

Mike Braunstein

Bian, Z., Braunstein, M. L., & Andersen, G. J. The ground dominance effect in the perception of relative distance in 3-D scenes is mainly due to characteristics of the ground surface. *Perception & Psychophysics* . In press.

Bocheva, N., & Braunstein, M. L. (2006). Effects of surface markings on judgments of motion direction. *Perception, 35,* 723-748.

Ni, R., Braunstein, M. L., & Andersen, G. J. Scene layout from ground contact, occlusion, and motion parallax. *Visual Cognition.* In press.

Scott Brown

Brown, S., Ratcliff, R., & Smith, P.L. Evaluating methods for approximating stochastic differential equations. Journal of Mathematical Psychology.

Brown, S.D., Lehmann, C., & Poboka, D. (2006). A critical test of the failure-to-engage theory of task-switching. Psychonomic Bulletin & Review, 13, 152-159.

Steyvers, M. & Brown, S.D. (2005). Prediction and Change Detection. Advances in Neural Information Processing Systems, 18.

Brown, S.D. & Steyvers, M. (2005). The dynamics of experimentally induced criterion shifts. Journal of Experimental Psychology: Learning, Memory & Cognition, 31, 587-599.

David Brownstone

"Estimating Commuters' "Value of Time" with Noisy Data: a Multiple Imputation Approach" (with S. Steimetz), *Transportation Research B*, 39, 865-889, 2005.

"Recent Progress on Endogeneity in Choice Modeling" (with J Louviere, K Train, M Ben-Akiva, C Bhat, T A Cameron, R. Carson, J.R. DeShazo, D Fiebig, W Greene, D Hensher, and D Waldman), *Marketing Letters*, 16 (3-4), 2005.

Carter Butts

Butts, Carter T. (2006). "Permutation Models for Relational Data." *Sociological Methodology*, forthcoming.

Butts, Carter T. and Carley, Kathleen M. (2006). ``Structural Change and Homeostasis in Organizations: A Decision-Theoretic Approach." *Journal of Mathematical Sociology*, forthcoming.

Butts, Carter T. and Cross, B. Remy. (2006). "Change and External Events in Computer-Mediated Citation Networks: English Language Weblogs and the 2004 U.S. Electoral Cycle." *Journal of Social Structure*, forthcoming.

Butts, Carter T.; Petrescu-Prahova, Miruna; and Cross, B. Remy. (2006). "Responder Communication Networks in the World Trade Center Disaster: Implications for Modeling of Communication Within Emergency Settings." *Journal of Mathematical Sociology*, forthcoming.

Charles Chubb

Chubb, C, Y. Inagaki, P. Sheu, B. Cummings, A. Wasserman, E. Head, C. Cotman, "BioVision: an application for the automated image analysis of histological sections." *Neurobiology of Aging*, in press.

Morgan, M., C. Chubb, J.A. Solomon, "Predicting the motion after-effect from sensitivity loss," *Vision Research*, 46, 2412-2420, 2006.

Barbara Dosher

Lu, Z., Chu, W., & Dosher, B. (2005). Independent perceptual learning in monocular and binocular motion systems. *Proceedings of the National Academy of Sciences, USA,* 102, 5624-5629.

Dosher, B., & Lu, Z. (2005). Perceptual learning in clear displays optimizes performance: Learning the limiting process. *Proceedings of the National Academy of Sciences, USA* 104, 5286-5290.

Lu, Z.-L., Chu, W., Dosher, B., & Lee, S. (2005). Perceptual learning of Gabor orientation identification in visual periphery: Complete inter-ocular transfer of learning mechanisms, *Vision Research*, 45, 2500-2510.

Petrov, A. A., Dosher, B., & Lu, Z. (2005). The dynamics of perceptual learning: An incremental reweighting model. *Psychological Review,* 112, 715-743.

Lu, Z., Neuse, J., Madigan, S., & Dosher, B. (2005). Fast decay of iconic memory in observers with mild cognitive impairment. *Proceedings of the National Academy of Sciences*, USA, 102, 1797-1802.

Lu, Z.-L. & Dosher, B. (2005). Brain mechanisms of attention. In Cognitive Neuroscience *(translated into Chinese),* Edited by Y.-J. Luo, J. Yang and K. Cheng. Peking University Press, Beijing, China.

Dosher, B., & Lu, Z.-L. (2006). Levels and mechanisms of perceptual learning: Learning 1st order luminance and 2nd order texture objects. *Vision Research.*

Lu, Z.-L., Chu, W., & Dosher, B. (2006). Perceptual learning of motion direction discrimination in fovea: Separate mechanisms. *Vision Research*.

Petrov, A., Dosher, B., & Lu, Z.-L. (2006, in press). Perceptual learning without feedback in non-stationary environments: Data and model. *Vision Research.*

Lesmes, L., Jeon, S.-T., Lu, Z.-L., & Dosher, B. (2006, in press). Bayesian adaptive estimation of threshold versus contrast external noise functions. *Vision Research.*

Dao, D. Y., Lu, Z.-L., & Dosher, B. (2006, in press). Adaptation to sine wave gratings selectively reduces the sensory gain of the adapted stimulus. *Journal of Vision.*

Jean-Claude Falmagne

Hsu, Y.F., Regenwetter, M., and Falmagne, J.-Cl, (2005). The tune in-and-out model: a random walk and its application to a presidential election survey. *Journal of Mathematical Psychology*, 49(4), 276-289.

Falmagne, J.-Cl. (2005). Mathematical psychology: A perspective *Journal of Mathematical Psychology*, 49(6), 436-439.

Falmagne, J.-Cl., Cosyn, E., Doignon, J.-P., and Thiery, Nicolas (2006). The assessment of knowledge, in theory and in practice. In B. Ganter and L. Kwuida (Eds.): ICFCA 2006, LNAI 3874, pp. 6179.

Michele Garfinkel

Garfinkel, M. Reprinted article: "Global Threats and the Domestic Struggle for Power," in *The Economic Analysis of Terrorism*, edited by Tilman Brueck (London: Routledge, forthcoming 2006).

Amihai Glazer

Glazer, Amihai, Vesa Kanniainen, and Mikko Mustonen. When a loser gains: Free riding in the innovation of network goods. Forthcoming, *Journal of Economics*.

Glazer, Amihai and Vesa Kanniainen. Short-term leaders should make long-term appointments. Forthcoming, *International Tax and Public Finance*.

Glazer, Amihai and Esko Niskanen. (2005). Why users of congested roads may view tolls as unjust. European Transport/Transporti Europei. Volume 11, Number 31, pp. 6-14.

Glazer, Amihai. (2006). Rewarding political supporters. *Public Choice* (Volume 126, Numbers 3-4, pp. 453-463.

Glazer, Amihai and Bjorn Segendorff. (2005) Credit claiming. *Economics of Governance* (Volume 6, Issue 2), pp. 125-137.

Cowen, Tyler and Amihai Glazer. (2005). Taxation and pricing when consumers value freedom. *Social Choice and Welfare* (Volume 24, Number 2, April), pp. 211-220.

Glazer, Amihai and Mark Gradstein. (2005). Elections with contribution-maximizing candidates. Public Choice, (Volume 122, Numbers 3-4, March), pp. 467-482.

Bernard Grofman

Regenwetter, Michael, Bernard Grofman, A. A. J. Marley and Ilia Tsetlin. (2006). Behavioral Social Choice: Probabilistic Models, Statistical Inference, and Applications. New York: Cambridge University Press.

Fraenkel, Jon and Bernard Grofman. (2006). Does the Alternative Vote Foster Moderation in Ethnically Divided Societies? The Case of Fiji. *Comparative Political Studies*, 39(5): 623-651.

Adams, James, Samuel Merrill and Bernard Grofman. (2005). Does France's Two-Ballot Presidential Election System Alter Candidates' Policy Strategies? A Spatial Analysis of Office-Seeking Candidates in the 1988 Presidential Election. *French Politics*, 3(2):98-123.

Owen, Guillermo and Bernard Grofman. Two-Stage Electoral Competition in Two-Party Contests: Persistent Divergence of Party Positions. *Social Choice and Welfare*, forthcoming.

Owen, Guillermo, Ines Lindner and Bernard Grofman. Modified Power Indices for Indirect Voting. In Braham, Matthew (Ed.) Festschrift for Manfred Holler (title tentative). Springer Verlag, forthcoming.

Godfrey, Joseph and Bernard Grofman. Lobbying for Votes in Only Some of the Right Places: Using the Shapley-Owen Value to Evaluate the Efficiency of Special Interest Lobbying on the 1993 Clinton Health Care Reform Proposal in the U.S. Senate and U.S. House of Representatives. In Braham, Matthew (Ed.) In Braham, Matthew (Ed.) Festschrift for Manfred Holler (title tentative). Springer Verlag, forthcoming.

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Brian Skyrms

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Mark Steyvers

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Douglas White

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D. White, N. Kejzar, and L. Tambayong . (Invited paper), Discovery of oscillatory dynamics of city-size distributions in world historical systems,. In preparation for G. Modelski, ed., *Globalization as Evolutionary Process Modeling, Simulation, and Forecasting Global Change,* forthcoming.

Jack Xin

J. Xin. (2006). A Study of Hearing Aid Gain Functions Based on a Nonlinear Nonlocal Feedforward Cochlea Model (with Y.S. Kim, Y-Y Qi). *Hearing Research*, Volume 215, Issues 1-2, pp 84-96.

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A two-dimensional nonlinear nonlocal feed-forward cochlear model and time domain computation of multitone interactions (with Y.S. Kim). (2005). *SIAM J. Multiscale Modeling and Simulation*, Vol. 4, No. 2, pp 664-690.

An Invertible Discrete Auditory Transform (with Y-Y Qi). (2005). *Communications in Math Sciences*, Vol. 3, No. 1, pp 47-56.

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J. Xin. Variational Principle of KPP Front Speeds in Temporally Random Shear Flows with Applications (with J. Nolen). *Communications in Mathematical Physics*. Forthcoming

Jack Yellott

Yellott, J. I. (2005). Correcting spurious resolution [Abstract]. *Journal of Vision*, 5(12), p.97

Zhao

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Y. Zhang, H. Zhao, S. Chen. Fixed-point Iterative Sweeping Methods for Static Hamilton-Jacobi Equations. Forthcoming in *Methods and Applications of Analysis*.

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K. Huang, G. Papanicolaou, K. Solna, C. Tsogka, H. Zhao. (2006). Efficient Numerical Simulation for Long Range Wave Propagation. *Journal of Computational Physics,* Vol. 215(2), pp. 448-464.

D. Lu, H. Zhao, M. Jiang, S. Zhou, and T. Zhou. A Surface Reconstruction Method for Highly Noisy Point Clouds. Forthcoming in *Lecture Notes in Computer Science*, Springer.

J. Xu, Z. Li, J. Lowengrub and H. Zhao. (2006). A Level Set Method for Interfacial Flows with Surfactant. *Journal of Computational Physics*, Vol. 212(2), pp. 590-616.

APPENDIX C
IMBS TECHNICAL REPORTS, 200405

MBS 05-07 – On the utility of Gambling: Extending the approach of Meginniss (1976)
C.T. Ng, R. Duncan Luce, A.A.J. Marley

MBS 05-08 – Building Inferentially Tractable Models of Complex Social Systems: a Generalized Location Framework
Carter T. Butts

MBS 05-09 – Dynamics of Conformist Bias
Brian Skyrms

MBS 05-10 – Modeling lateral geniculate nucleus cell response spectra and Munsell reflectance spectra with cone sensitivity curves
A. Kimball Romney and Roy G.D'Andrade

MBS 05-11 – Learning to Network
Brian Skyrms and Robin Pemantle

MBS 05-12 – A Study of Hearing Aid Gain Functions Based on a Nonlinear Nonlocal Feedforward Cochlea Model
Yongsam Kim, Jack Xin, and Yingyong Qi

MBS 06-01– From Decision Problems to Dethroned Dictators
Jason Kronewetter and Donald G. Saari

MBS 06-02 – A Multiple Objective Decision Analysis Involving Health and Safety Risks: Potassium Iodide Distribution in Nuclear Incidents
Tianjum Feng and L. Robin Keller

MBS 06-03 – Empirical Evaluation of a Model of Global Psychophysical Judgments IV. Forms for the Weighting Function
Regnar Steingrimsson and R. Duncan Luce

MBS 06-04 – Finessing a point; augmenting the core
Donald Saari and Garrett R. Asay

APPENDIX D
COLLOQUIA AND CONFERENCES OF IMBS MEMBERS, 2004-05[2]

William Batchelder

"Order Restricted Inference Using Reparameterized Models." Invited paper presented in the Symposium titled "Bayesian Nonparametric and Order Constrained Statistical Inference", International Meeting of the Psychometric Society, Tilburg, Netherlands, July 2005.

"Cognitive Psychometrics." Invited Keynote Address at the Annual Meeting of the Society for Mathematical Psychology, Memphis, TN, August 2005.

"Hierarchical Multinomial Processing Tree Models." Smith, J.B., and Batchelder, W.H. Paper presented at the Annual Meeting of the Society for Mathematical Psychology, Memphis, TN., August, 2005.

"Minimum Description Length Complexity of Multinomial Processing Tree Models." Wu, H., Myung, J., and Batchelder, W.H. Paper presented at the Annual Meeting of the Society for Mathematical Psychology, Memphis, TN., August 2005.

"Cultural Consensus Theory (CCT) with Continuous Numerical Responses." Strashny, A., Batchelder, W.H., and Romney, A.K. Paper presented at the Annual Meeting of the Society for Mathematical Psychology, Memphis, TN., August 2005.

"Meta-cognitive Guessing Strategies in Source Monitoring." Invited paper in symposium titled "Memory & Metamemory: Papers in Honor of Thomas O. Nelson". Toronto Canada, November 2006.

"Hierarchical Multinomial Processing Tree Models." Smith, J.B., and Batchelder, W.H. Poster presented at the Annual meeting of the Psychonomic Society, Toronto, Canada, November, 2005.

"Bayesian Inference and Multinomial Processing Tree (MPT) Models." Batchelder, W.H., and Smith, J.B. Paper Presented at the 44th Ward Edwards Bayesian Research Conference, Fullerton, CA, January 2006.

"Cognitive Psychometrics and Multinomial Processing Tree Modeling." Invited paper presented at the Conference titled New Directions in Psychological Measurement with Model-Based Approaches. Georgia Tech, Atlanta, GA., February, 2006.

[2] Those members not listed failed to respond to our request for information.

John Boyd

"Computing Continuous Core/Periphery Structures for Social Relations Data Using MINRES SVD". With W.J. Fitzgerald, M. Mahutga, and D.A. Smith. Twenty-fifth Annual International Sunbelt Social Network Conference, Vancouver. April.

"Triad census statistics for a random graph model". Second author, with Akishige Kishida.Twenty-fifth Annual International Sunbelt Social Network Conference, Vancouver. April. Also at the IMBS Colloquium June 1.

William Branch

"Monetary Policy, Endogenous Inattention, and the Volatility Trade-off", Federal Reserve Bank of New York, July 2005

"Model Uncertainty and Endogenous Volatility", Society for Computational Economics Annual Meeting, July 2005

"Model Uncertainty and Endogenous Volatility", Federal Reserve Bank of Cleveland, September 2005

"Model Uncertainty and Endogenous Volatility" Department of Economics, University of California, Riverside, October 2005

"Monetary Policy, Endogenous Inattention, and the Volatility Trade-off", Department of Economics, California State University Fullerton, November 2005

"Monetary Policy, Endogenous Inattention, and the Volatility Trade-off", Department of Economics, University of California, Irvine, November 2005

"Model Uncertainty and Endogenous Volatility", Conference on Monetary Policy and Model Uncertainty, University of Oslo, June 2006

"Monetary Policy, Endogenous Inattention, and the Volatility Trade-off", Federal Reserve Bank of Atlanta, June 2006

Mike Braunstein

"Interaction of scene background, size change, direction and velocity in determining perceived motion in depth," with Gillespie, S., & Andersen, G. J. Vision Sciences Society, Sarasota, FL. May, 2006.

"Background surface and horizon effects in the perception of relative size," with Ozkan, Vision Sciences Society, Sarasota, FL. May, 2006.

Scott Brown

"A ballistic accumulator for absolute identification, and problems with numerical integration of SDEs". Special workshop on diffusion models, Freiburg, Germany. With Ratcliff, R., Smith, P.L., Marley, A.A.J. & Heathcote, A.H. 2006.

"Keeping up with the world: Change detection". Paper presented at the 2005 meeting of the Society for Mathematical Psychology.. Memphis, TN, USA. With Steyvers, M.

"Inference in dynamic decision making". Paper presented at 2005 annual review of research funded by the AFOSR. Florida, U.S.A. With Steyvers, M.

David Brownstone

"Valuing Time and Reliability: Assessing the Evidence from Road Pricing Demonstrations" (with K. Small). Presented at Department of Economics, University of Oregon, October 2005.

"The Impacts of Allowing Hybrid Vehicles and Solo Toll-Paying Vehicles in Existing High-Occupancy Vehicle Lanes" (with W. Recker and C. Breiland). Working paper, June, 2006.

Carter Butts

"Dynamic Communication Networks During Extreme Events: an Intertemporal Analysis of Radio Communication During the World Trade Center Disaster." Invited Conference Presentation, NetSci International Conference and Workshop on Network Science. Bloomington, IN, May 2006.

"Likelihood-based Network Comparison Using Permutation Models." Invited Workshop Tutorial, NetSci International Conference and Workshop on Network Science. Bloomington, IN, May 2006.

"Modeling Communication Dynamics During Extreme Events: The Case of the World Trade Center Disaster." Age of Networks Speaker Series, Center for Advanced Study, University of Illinois at Urbana-Champaign. Champaign, IL, May 2006.

"Statistical Mechanical Models for Social Systems with Complex Dependence Structures." International Workshop on Constructal Theory of Social Dynamics, Duke University. Durham, NC, April 2006.

"Extreme Networking: Communication and Coordination Networks During the WTC Disaster." Organizational Behavior Seminar Series, Graduate School of Business, Stanford University. Stanford, CA, December 2005.

"Social Networks: Introduction and Prospect." Keynote Address, EII-NICTA Workshop on Large-Scale Network Analysis, National Information and Communications Technology Australia. Sydney, New South Wales, Australia, November 2005.

"Exponential Family Models for Assignment Systems." Department of Psychology Colloquium, University of Melbourne. Melbourne, Victoria, Australia, November 2005.

"Building Inferentially Tractable Models for Complex Social Systems: a Generalized Location Framework." ASA Section on Mathematical Sociology Invited Paper Session, "Mathematical Sociology Today: Current State and Prospects." ASA Meeting, Philadelphia, PA, august 2005.

"Implication Structures and Household Artifacts: Analyzing the Changing Patterns of Ownership and Possession in the American Home, 1980--2003." Acton, Ryan and Butts, Carter T. 26th Sunbelt Network Conference (INSNA), Vancouver, BC, April 2006.

"Predictors of Dyadic Interaction in Emergent Multiorganizational Networks Following the World Trade Center Attacks." Bevc, Christine; Butts, Carter T.; Liu, Sophia; and Tierney, Kathleen. 26th Sunbelt Network Conference (INSNA), Vancouver, BC, April 2006.

"Curved Exponential Family Parameterizations for Spatial Network Models." 26th Sunbelt Network Conference (INSNA), Vancouver, BC, April 2006.

"Network Inference with Missing Data: A Performance Comparison of Existing Models." (4/2006). 26th Sunbelt Network Conference (INSNA), Vancouver, BC, April 2006.

"Structural Properties of Power-Relevant Relations." Reich, Leah and Butts, Carter T. 26th Sunbelt Network Conference (INSNA), Vancouver, BC, April 2006.

"Radio Communication Networks in the World Trade Center Disaster." Butts, Carter T. and Petrescu-Prahova, Miruna. ASA Meeting, Philadelphia, PA, august 2005.

Charles Chubb

"Automated measurement of cuttlefish patterns". C. Chubb, K. Buresch & R. Hanlon at Wright-Patterson Airforce Base, Dayton, Ohio, January 2006.

"The influence of local context on change detection". S. Kies, C. Chubb. Poster presented by S. Kies at the annual meeting of the Vision Sciences Society, Sarasota, FL, May 5, 2006.

"Evidence for plaid-grabbers". C. Chubb, J. Solomon, M.J. Morgan. Poster presented by C. Chubb at the annual meeting of the Vision Sciences Society, Sarasota, FL, May 6, 2006.

"Attentional filtering of dot intensities in centroid estimation". S.A. Wong-Drew, C. Chubb, G. Sperling. Poster presented by S.A. Wong-Drew at the annual meeting of the Vision Sciences Society, Sarasota, FL, May 6, 2006.

"Isodiscrimination contours in a three-parameter texture space". J.D. Victor, A. Ashurova, C. Chubb & M.M. Conte. Poster presented by J.D. Victor at the annual meeting of the Vision Sciences Society, Sarasota, FL, May 6, 2006.

Barbara Dosher

"The dynamics and specificity of perceptual learning". Annual Interdisciplinary Conference, January 2006.

"Effects of perceptual learning on the temporal dynamics of perceptual decision". *Vision Sciences Society Abstract Book*, Conference, May 2006. Chu, W., Lu, Z.-L., Dosher, B.

"Transfer patterns of perceptual learning in simultaneous training of easy and difficult tasks". *Vision Sciences Society Abstract Book*, Conference, May 2006. Jeter, P., Dosher, B., Lu, Z.-L.

Attention enhancement along the path of a sequence of saccades. *Vision Sciences Society Abstract Book*, Conference, May 2006 (with Gersch, T. M., Schnitzer, B. S., Singhvi, P. S.).

"Extending observer models for more difficult identification and discrimination". *Vision Sciences Society Abstract Book*, Conference, May 2006. Jeon, S-T., Lu, Z.-L., Dosher, B.

"An adaptive method for estimating criterion sensitivity (d') levels in yes/no tasks". *Vision Sciences Society Abstract Book*, Conference, May 2006. Lesmes, L. A., Lu, Z.-L., Tran, N. T., Dosher, B. Albright, T. D.

Michelle Garfinkel

"Globalization and domestic conflict", in the Economics Department at the University of California-Los Angeles, May 2006.

Ami Glazer

"Migration in Search of Good Government," presented at joint seminar of Humboldt University, Free University, and WZB Berlin.

Bernard Grofman

"Optimal Resource Allocations in Presidential Contests." Annual Fall Meeting of the European Consortium for Political Research, Budapest, Hungary, September 8-12, 2005.

"Supply versus Demand and the Rule of Ideology in the Growth of Government: The United States, 1930-2002." Public Choice Society Annual Meeting, March 30-April 2, 2006, New Orleans, LA.

"Testing Sincere versus Strategic Split Ticket Voting: Evidence from Split House-President Outcomes, 1900-1996." Center for American Political Studies "Democracy, Divided Government, and Split-Ticket Voting" conference, Harvard University, May 26-27, 2006.

"Runoff Methods." Plurality and Multiround Elections Conference, University of Montreal, June 17-18, 2006.

Panel Chair, "Party Formation Barriers and their Effect on Ethnic Party Building and Success in New Democracies." Annual meeting of the American Political Science Association, September 2, 2005.

"Changing the Rules of the Game in New Democracies: Political Participation and Electoral Regime Change in Eastern Europe and Latin America", discussant. Annual meeting of the American Political Science Association, September 2005.

"Protecting Democracy: Using Research to Inform the Voting Rights Reauthorization Debate", invited discussant. Symposium on Institute on Race, Ethnicity and Diversity, sponsored by Earl Warren Institute, UC Berkeley and the Institute for Government Studies, UCB, Washington D.C., February 9, 2006.

Donald Hoffman

"Human Vision and Automotive Lighting." Paderborn University—Hella LLAB Summerschool, Germany. 2005.

"Human Vision and Automotive Lighting." Paderborn University—Hella LLAB Summerschool, Germany.

"Perception, Evolution, and the Mind-Body Problem." Psychology Students Association, UCI. 2006.

"Visual Intelligence." FUSION Conference, UCI. 2006.

"Visual Intelligence." Regents Scholars Association, UCI. 2006.

"Perception, Evolution, and the Mind-Body Problem". Future Salon, UCLA. 2006.

"Conscious Realism." Toward a Science of Consciousness Conference, Tuscon, 2006.

"Perception Evolution, and the Mind-Body Problem". Soka University, Aliso Viejo, CA. 2006.

"Perception Evolution, and the Mind-Body Problem". Brain & Cognitive Sciences, MIT. 2006.

"Perception, Evolution, and the Mind-Body Problem." IMBS, UC Irvine. 2006.

"Perception, Evolution, and the Mind-Body Problem" Psychology Students Association, UCI. 2006.

"Visual Intelligence". FUSION Conference, UCI. 2006.

"Visual Intelligence". Regents Scholars Association, UCI. 2006.

"Perception, Evolution, and the Mind-Body Problem. Future Salon, UCLA. 2006.

"Conscious Realism". Toward a Science of Consciousness Conference, Tucson. 2006.

"Perception, Evolution, and the Mind-Body Problem"
.Soka University, Aliso Viejo, CA. 2006.

"Perception, Evolution, and the Mind-Body Problem". Brain & Cognitive, Sciences, MIT. 2006.

"Perception, Evolution, and the Mind-Body Problem." IMBS, UC Irvine. 2006.

Tarow Indow

"The global structure of visual space". Special invited lecture of the 69th Annual meeting of Japanese Psychological Association at Keio University in Tokyo, September 12, 2006.

"Two approaches in visual space and color space". Invited talk at Waseda University, Tokyo, September 20, 2006.

Marek Kaminski

"How Communism Could Have Been Saved. Unexpected Consequences of an Electoral Law:" Warsaw East European Conference, Warsaw, July 2005.

"Coalitional Stability of Multi-Party Systems: Evidence from Poland." Rice University, February 2006.

"Games Prisoners Play". Institute of Sociology, Warsaw, July 2005.

"Why Post-Communists Punish Themselves? A Model of Transitional Justice Legislation", (with Monika Nalepa). Presented at Rice University, February 2006; and the 5th Annual Humane Studies Research Colloquium, May 2006.

"Transitional Justice and the Rule of Law", (with Monika Nalepa): Warsaw East European Conference, Warsaw, July 2005.

Robin Keller

"How to Make Smart Choices: Value-Focused Decision Making," Life Office Management Association, Irvine, Orange County, June 7, 2006.

"Medical Decision Analysis," Grand Rounds presentation for the Department of Psychiatry & Human Behavior, UCI Hospital, May 2, 2006.

"Home Depot in San Juan Capistrano: Multiple Objective Multi-Stakeholder Decision," recipient of finalist award, November 2005, INFORMS Case Competition sponsored by INFORMS Forum on Education. Tianjun Feng, L. Robin Keller and Xiaona Zheng.

"Home Depot in San Juan Capistrano: A Multi-Objective Multi-Stakeholder Decision Case," presented as a poster at Teaching pre-conference of the Behavioral Decision Research in Management Conference, Santa Monica, June 2006. Tianjun Feng, L. Robin Keller, and Xiaona Zheng.

"A Multiple-objective, Multiple-stakeholder Decision Analysis Approach for Water Resources Planning," INFORMS International Meeting, Hong Kong, June 2006. Invited presentation in session organized by Keller. Tianjun Feng (presenter), L. Robin Keller, Lowell Kessel, Craig Kirkwood, Nancy Jones, Jay Simon.

"Using a Time-Weighted Approach to Assess Multiple Attribute Utility," presented as a poster at the Behavioral Decision Research in Management Conference, Santa Monica, June 2006. L. Robin Keller, Dipayan Biswas, Tianjun Feng , Xiaona Zheng.

"Water Resource Management Priorities for Central Arizona Water Experts". Arizona State University Decision Center for a Desert City Water Briefing, March 1, 2006. Craig W. Kirkwood, L. Robin Keller (presenter), and Nancy Jones.

"Decision Research in Water Resources Management: A Multiple-Objective, Multiple-Stakeholder Analysis," poster presentation at Central Arizona – Phoenix Long-Term Ecological Research (CAPLTER), Eighth Annual Poster Symposium. Arizona State University, January 2006. Craig Kirkwood, L. Robin Keller, and Nancy Jones,

"Decision Research in Water Resources Management: A Multiple-objective, Multiple-stakeholder Analysis," invited presentation for New Orleans (moved to San Francisco) INFORMS conference, November 2005. W.P Carey School of Business, ASU, Nancy Jones, Decision Center for a Desert City, ASU, L. Robin Keller, Craig Kirkwood (presenter).

"Modeling the Effects of Reference Point Dependence on Supplier Selection," invited presentation at IFORS conference, July 2005, Honolulu. Tianjun Feng (presenter) and L. Robin Keller.

Natalia Komarova

"Cancer as somatic evolution", Working Group Meeting on Computational Tumor Modeling, Center for the Development of a Virtual Tumor and DIMACS, Rutgers, NJ. August 2006.

"Cancer as somatic evolution", IMBS colloquium, April 2006.

"Cancer as somatic evolution", AMS Meeting: special session on mathematical biology, Notre Dame, April 2006.

"Cancer as somatic evolution", The Interdisciplinary Center for the Study of Biocomplexity, April 2006.

“Evolution and Learning of Language**”,** The Evolution of Norms conference, IMBS, UCI, January 2006.

“Somatic evolution and cancer”, 5th International Georgia Tech Conference on Bioinformatics, Atlanta, GA (keynote speaker), Fall 2005.

Igor Kopylov

“A Parametric Model of Ambiguity Hedging”. Invited talk at the Theory seminar, UC San Diego, Nov, 2005.

“Cognitive Dissonance and Choice”. Risk, Uncertainty, and Decisions Conference, Paris, June 2006.

Vladimir Lefebvre

“A Fear as a Factor of Demoralization”. The Fourth International Conference on Reflexive Processes and Control, the Institute of Philosophy, Russian Academy of Sciences. Moscow, Russia, October 2005.

“Reflexive Models”, Second Conference on Mathematical Methods in Counterterrorism and Computer Security, Benedict College, SC, November 2005.

R. Duncan Luce

“Testing a global psychophysical theory” (with Ragnar Steingrimsson). Society for Mathematical Psychology, Memphis, TN. July 2005.

“Half a century of psychological modeling: Selected recollections and reflections.” European Mathematical Psychology Group, Padua, Italy. September 2005.

“Merging Savage and Shannon: Entropy-modified subjective expected utility.” Purdue, IN, Conference. October 2005.

“Rational irrationality or irrational rationality.” Annual Edwards Bayes Conference, Fullerton, CA. January 2006.

“Ruminations on half a century of psychological modeling.” First Clyde Coombs Memorial Lecture, University of Michigan, Ann Arbor, MI. April 2006.

“Utility of gambling: Entropy-modified utility forms.” Conference in Memory of Clyde Coombs, University of Michigan, Ann Arbor, MI. April 2006.

“Utility of Gambling: Entropy-Modified Utility Forms.” Periodic meeting of Foundations of Utility and Risk, XII, Rome, Italy. June 2006. Also participation in a round table organized by Mark Machina.

Michael McBride

"Club Mormon: Free-riding, Monitoring, and Exclusion in the LDS Church", George Mason University, Feb 2006.

"Happiness and Aspiration Formation: An Experimental Study", UC Davis, Nov 2005.

"Happiness and Aspiration Formation: An Experimental Study", Brigham Young University, Oct 2005.

"Why Hasn't Economic Growth Killed Religion?". Association for the Study of Religion, Economics, and Culture Meetings, Nov 2005.

"Happiness and Aspiration Formation: An Experimental Study". Economics of Happiness Symposium, USC, Mar 2006.

Anthony McGann

"The Calculus of Consensual Democracy: Rethinking Patterns of Democracy", Esssex University, UK. March 2006.

"The Problem of Consensus in Habermas and Rawls: Rethinking the Basis of Deliberative Democracy". American Political Science Association Conference. September 2005.

"Consensus without Veto-Players: Testing Theories of Consensual Democracy", American Political Science Association Conference. September 2005.

Dale Poirier

"A Statistical Model of Intifada Fatalities," with Ivan Jeliazkov, Econometric Society World Congress, London, August 24, 2005.

"A Statistical Model of Intifada Fatalities," with Ivan Jeliazkov, Seminar in Bayesian Inference in Econometrics and Statistics, University of Iowa, Iowa City, April 29, 2006.

"A Statistical Model of Intifada Fatalities," with Ivan Jeliazkov, Valencia / ISBA Eighth World Meeting on Bayesian Statistics, Benidorm, Spain, June 3, 2006.

"Applications of Bayesian Econometrics," Internal Economics Training Program, IMF Institute, International Monetary Fund, Washington D.C., September 12-14, 2005.

Donald Saari

"Mathematics and Democracy: Voting and Collective Choice," Centre for Scientific Culture, Erice, Sicily, September 2005.

"All those frustrating 'Choice Dictators'; what do they really mean?" Plenary talk, European Public Choice Society, Turku, Finland, April 2006.

"Chaotic evolution of Newton's universe". Perimeter Institute & University of Waterloo, Waterloo, Canada , March 2006.

"Disposing Arrow's dictator and understanding those mysteries about voting." W. Laurier University, Economics, March 2006.

"Geometry of departmental discussions." Inaugural Fields-Carleton Distinguished Lecturer, Ottawa, Canada , March 2006.

"Developing a qualitative evolutionary game theory." Carleton University, Mathematics, Ottawa, Canada, March 2006.

"Which is better: the Condorcet of Borda winner?" Political Science, University of Turku, Turku, Finland, April 2006.

"Mathematics is everywhere." Guest speaker at US National Olympiad Ceremonies, NAS, Washington, DC. June 2005.

"From voting theory to the mysteries of price dynamics." Opening plenary speaker, General Equilibrium, Purdue, October 2005,

"Finessing the core; a new solution concept." Spatial Voting Conference, IMBS, December 2005,

"The evolution of the universe--via Newton's equations." Plenary speaker, Math Association of America, Stanford University, February 2006.

"Parts, Whole, and Information", "Toward a theory of qualitative dynamics". IMBS Conference on "Mathematical Economics, What Next?" May, 2006.

"Mathematics of Voting", Mini-course; "The chaotic evolution of Newton's universe", Plenary talk; "The power and beauty of mathematics", Banquet talk; MAA Regional Meeting, University of So. Oregon, June 2006.

"Chaotic Evolution of Newton's Universe," Department of Mathematics,
"Excellence in teaching: Don't forget your toilet paper", Kaneb Center for Teaching
Notre Dame University, September 2005.

"Can we really trust election outcomes?" Academians of Laguna Woods, October 2005.

"Why 'Decisions and Elections' can be so difficult", NSF Distinguished Lecture Series, MPS , January 2006.

"Mathematics unravels the negatives of Arrow's and Sen's theorems." Department of Mathematics, Santa Clara, February 2006.

Stergios Skaperdas

"Conflict and endogenous governance, with an application to Bolivia," Workshop on Economics and Conflict, Center for the Study of Civil Wars, Peace Research Institute of Oslo, Norway, June 2006.

"Economics and Conflict: The Dark Side of Self-Interest and its Governance as Economic Activities," conference in memory of Herschel Grossman, Brown University, April 2006.

"Explaining Conflict in Low-Income Countries: Incomplete Contracting in the Shadow of the Future," Conference on conflict and institutions, Institute for Governmental Studies, UC Berkeley, April 2006.

"Globalization and Domestic Conflict," Economics Seminar, Athens University of Economics and Business, March 2006.

"Economics and Conflict: The Dark Side of Self-Interest and its Governance as Economic Activities," conference in memory of Jack Hirshleifer, UCLA, March 2006.

"Persuasion as a Contest," Economics Department Seminar, Drexel University, February 2006.

"Globalization and Conflict," CGPACS seminar, UCI, January 2006.

"Explaining Conflict in Low-Income Countries: Incomplete Contracting in the Shadow of the Future," Session on "International Conflict," Peace Science Society International, Allied Social Science Association Meetings, Boston, MA, January 2006.

"Explaining Conflict in Low-Income Countries: Incomplete Contracting in the Shadow of the Future," Conference of the EU Network on Polarization and Conflict, Bocconi University, Milan, Italy, December 2005.

"Economics and Conflict: The Dark Side of Self-Interest and its Governance as Economic Activities," Workshop on Economics and Conflict, Center for the Study of Civil Wars, Peace Research Institute of Oslo, Norway, December 2005.

"Globalization and Insecurity: Reviewing Some Basic Issues," CESifo Conference on "Guns and Butter: The Economic Causes and Consequences of Conflict," Munich, Germany, December 2005.

"Economics and Conflict: The Dark Side of Self-Interest and its Governance as Economic Activities," Keynote speaker, XV Annual Mexican Colloquium of Mathematical Economics and Econometrics, Tijuana, Mexico, November 2005.

"Persuasion as a Contestt," WZB conference on "advances in the theory of contests and tournaments," Berlin, Germany, October 2005.

"Explaining Conflict in Low-Income Countries: Incomplete Contracting in the Shadow of the Future," CESifo conference on "political economy and development," Venice, Italy, July 2005.

"Three Lectures on Anarchy, Conflict, and Goverance," Summer School on "Economics, Extra-Legal Protection, and Organised Crime," European Science Days, Steyr, Austria, July 2005.

Brian Skyrms

"Learning to Signal", BIRS workshop on Evolutionary Game Dynamics Banff International Research Station. June 2006.

"The Stag Hunt", Rational Choice Seminar University of Chicago. May 2006.

Keynote Address Society for Exact Philosophy San Diego. May 2006.

"Evolution of Social Contract", Reichenbach Lecture UCLA. May 2006.

Florence Conference on Logic and Philosophy of Science. April 2006.

EURANDOM Conference of Reinforcement Processes Eindhoven, NL. April 2006.

"Learning to Signal", MBS Workshop on Evolution of Norms UC Irvine. January 2006.

"Learning to Network", "Learning to Signal", Philosophy Colloquium Stanford. December 2005.

"An Experimental Study of Happiness and Aspiration Formation", Economics Colloquium UC Davis. November 2005.

"Learning to Signal", Philosophy Colloquium U.C. Berkeley. October 2005.

"The Emergence of Signaling Systems", Conference on Games, Networks and Cascades Cornell Club NYC. October 2005.

Kenneth Small

Federal Reserve Bank of Chicago, July 2004.

University of Southern California, October 2004.

Conference on "Taxation and Decentralization," (session chair), Center for the Study of Democracy, UC Irvine, February 2005.

George Sperling

"Amplifying the effective perceptual contrast of a grating". Sperling, G., Appelbaum, L. G., & Lu, Z.-L. European Conference on Visual Perception, Coruna, Spain, August 24, 2005.

"A Neurally-Based Theory of Binocular Combination". Sperling, G. Thirty-First Annual Interdisciplinary Conference, Jackson, Wyoming, February 9, 2006.

"An Early Gain-Control Mechanism in Binocular Combination". Sperling, G., & Ding, J. Paper presented by G. Sperling. Vision Sciences Society, Sarasota, Florida, May 9, 2006.

"Visual Short-Term Memory and Context Memory for Grating Contrast". Lin, L., & Sperling, G. Poster presented by L. Lin. Vision Sciences Society, Sarasota, Florida, May 5, 2006.

"Visual Short-Term Memory and Context Memory for Grating Contrast." Wong-Drew, S. A., Chubb, C. F., & Sperling, G. Poster presented by S. Wong-Drew. Vision Sciences Society, Sarasota, Florida, May 6, 2006.

"A Computational Model for the Distribution of Spatial Attention". Hsu, A., Scofield, I., & Sperling, G. Poster presented by A. Hsu. Vision Sciences Society, Sarasota, Florida, May 7, 2006.

"Complex Spatial Distributions of Attention." Scofield, I., Hsu, A., & Sperling, G. Poster presented by I. Scofield. Vision Sciences Society, Sarasota, Florida, May 7, 2006.

"Flicker Elicits EEG Responses in Two Distinct Cortical Networks Depending on Attention and Flicker Frequency." Ding, J., Srinivasan, R., & Sperling, G. Poster presented by J. Ding. Vision Sciences Society, Sarasota, Florida, May 7, 2006.

"Motion Strength is Not what is Summed in the Vector Summation Computation of Plaid Motion." Liu, D., & Sperling, G. Poster presented by D. Liu. Vision Sciences Society, Sarasota, Florida, May 9, 2006.

Hal Stern

"College Football and BCS" (Invited Talk), Joint Statistical Meetings, Minneapolis, MN. August 2005.

"Bayesian Statistics: How and Why?", American Fisheries Society, Anchorage, AK. September 2005.

"Bayesian Methods for Experimental Studies", IMBS, UC-Irvine, CA. October 2005.

"Forensic Statistics: Bullet Matching", Department of Statistics, Brigham Young University, Provo, UT. March 2006.

"Assessment of Ancestry Probabilities in the Presence of Genotyping Errors," Department of Statistics and Applied Probability, UCSB, CA. May 2006.

"Watching Sports Through the Eyes of a Statistician," Continuing Learning Experience, Cal. State University, Fullerton. June 2006.

Mark Steyvers

University of California, San Diego. Department of Psychology. Colloquium.

Ohio State University. Department of Psychology. Colloquium.

Symposium on "Perception of Random Sequences" at the Eastern Psychological Association.

University of South Florida. Department of Psychology. Colloquium.

Society of Experimental Psychologists (SEP), San Diego, CA.

Annual Meeting of the Psychonomic Society, Toronto.

Annual meeting of the Society for Mathematical Psychology, Memphis, Tennessee.

Annual Summer Interdisciplinary Conference. Briancon, France.

Douglas White

"Civilizations as Dynamic Networks: Networks, Hierarchy and Complexity." European Conference on Complex Systems, Paris. November 16, 2005.

"Historical City Networks." For: Measuring and modeling state formation since the iron age, San Diego, ISA workshop meeting organized by Chris Chase-Dunn and Peter Turchin. March 20, 2006.

"Network Biconnectivity, Trade, and the Q-Dynamics of Historical City Size Distribution," Laurent Tambayong and Douglas White. Santa Fe Institute research workshop. May 15, 2006.

"Transforming Ethnographic Data and Analytical Problems into Network Data Suitable for Complementary Analysis and Theory." Max Planck Institute for Social Anthropology, Halle. Summer 2005.

"Civilizations as Dynamic Networks." Institute of Ethnology, University of Cologne. Summer 2005.

"Theory and Analysis of Kinship Networks." Anthropology Department, University of Hamburg, Summer, 2005.

"Civilizations as Dynamic Networks." Anthropology and Sociology, Central European University. Summer, 2005.

"Network Dynamics of Inter-Organization Collaborations in Biotechnology, 1988-1999." in collaboration with W. W. Powell and J. Owen-Smith. Jointly sponsored by Faculty of Economics and School of Social Science, University of Ljubljana. Summer, 2005.

"Causality of Network Configurations in Historical Dynamics: Some Hypotheses and Evidence." San Diego 47th Annual International Studies Association: The North-South Divide and International Studies. March 23, 2006.

"Discovery of oscillatory dynamics of city-size distributions in world historical systems." Douglas White, Nataša Kejžar and Laurent Tambayong. Seminar on Globalization as Evolutionary Process Modeling, Simulation, and Forecasting Global Change. Paper given and participation by two-way television. International Institute for Applied Systems Analysis, Laxenburg, Austria, April 7, 2006.

"Network Dynamics of City Sizes, Trade Networks, and Conflict." Annual Science Board Symposium, Santa Fe Institute. May 12, 2006.

"Innovation, Networks and Dynamics." Information Society as a Complex System EU Project Final Reports, Venice. May 26, 2006.

"Civilizations as Dynamic Networks: Historical Modeling and Simulation". Four-Campus UC Human Sciences and Complexity, UCI. Sept 30, 2005.

"Networks-Affect-Pricing Theory in Modern Production Industry: Three Network Studies of the Giant Industrial District of Tokyo". Tsutomu Nakano, Kwansei Gakuin University, and Doug White. Four-Campus UC Human Sciences and Complexity Seminar. UCSD. April 21, 2006.

"The Five Alternations Between Global Economy and Regional Economies in Eurasia in the Last Millennium: Definitive Evidence of Macro Civilizational Dynamics." Doug White and Laurent Tambayong. Four-Campus UC Human Sciences and Complexity Seminars. UCSD, June 22.

Jack Xin

Invited Hour Speaker, 1011th meeting of the American Mathematical Society, Lincoln Nebraska, Oct, 2005.

Applied Math Seminar, UC Berkeley, Nov, 2005.

Center for Hearing Research, UCI, Dec, 2005.

IMBS Math Visualization Seminar, April, 2006.

Analysis Seminar, UT Austin, April, 2006.

Jack Yellott

"Correcting spurious resolution." Annual Meeting, Optical Society of America, Tucson AZ, Oct. 2005.

"Correcting spurious resolution". IMBS colloquium, Nov. 11, 2005.

Hongkai Zhao

IMA Workshop on Imaging from Wave Propagation, University of Minnesota. October 2005.

High Frequency Wave Propagation Conference, Center for Scientific Computation and Mathematical Modeling, University of Maryland. September 2005.

Workshop on Level Set Methods for Direct and Inverse Problems, Linz, Austria. September, 2005.

Colloquium, Math Department, University of Maryland. February 2006.

Applied Mathematics Colloquium, UCLA. February 2006.

Applied and Computational Mathematics Seminar, Georgia Institute of Technology. September 2005.

APPENDIX E
FACULTY AWARDS/ACHIEVEMENTS

Scott Brown

New Investigator Award 2006, American Psychological Association, Experimental Psychology Division.

Carter Butts

Best Paper Award for "Emergency Phase Networks During the World Trade Center Disaster" (with Miruna Petrescu-Prahova and Remy Cross), Third Joint US-Japan Conference on Mathematical Sociology, Sapporo, Japan, 2005. To appear as "Responder Communication Networks in the World Trade Center Disaster: Implications for Modeling of Communication Within Emergency Settings," *Journal of Mathematical Sociology.*

Division Council Member, California Institute for Telecommunications and Information Technology.

Council Member, ASA Section on Mathematical Sociology.

Michelle Garfinkel

Editorial Board of: Journal of Money, Credit and Banking; Journal of Macroeconomics; Journal of Economics and Business; Defence and Economics; European Journal of Political Economy.

Bernard Grofman

UCI Distinguished Faculty Award for Research

Robin Keller

Chosen to be recipient of the 2006 Kimball Medal from INFORMS for major service contributions to Operations Research and the Management Sciences. I will receive the medal at the Pittsburgh INFORMS conference in November 2006. INFORMS (Institute for Operations Research and the Management Sciences).

Nominated to be the next Editor-in-Chief of *Decision Analysis*, the specialty journal published by INFORMS. I led the effort to found this journal, and will replace the founding Editors-in-Chief, Don Kleinmuntz and Bob Clemen. I will have my appointment confirmed by the INFORMS Board of Directors at their meeting in early August 2006.

Recipient of finalist award with Tianjun Feng and Xiaona Zheng. "Home Depot in San Juan Capistrano: Multiple Objective Multi-Stakeholder Decision", November 2005, INFORMS Case Competition sponsored by INFORMS Forum on Education.

UCI Committee on Committees, 2005-06.

Appointed Associate Dean for Full-Time MBA Program, from 8-06 through 7-08;
Chair of Masters Program Committee, 05-06; MBA Curriculum Innovation Committee, 2005-06.
UCI The Paul Merage School of Business.

Appointed Scientific Advisory Committee member, Homeland Security Center for Risk and Economic Analysis of Terrorist Events (CREATE), June 2005-.

Natalia Komarova

2006-2007 Distinguished Assistant Professor Award for Research, awarded by the Academic Senate, UCI.

Donald Saari

Chair, Board of Trustees, NSF Mathematical Sciences Research Institute in Berkeley.

National Advisory Board, Vermont Mathematics Partnership Ongoing Assessment.

Pacific Institute for Mathematical Sciences, Scientific Review Panel.

Laureate, Theta Tau (Professional Engineering Fraternity) National Hall of Fame.

Stergios Skaperdas

Keynote speaker, XV Annual Mexican Colloquium of Mathematical Economics and Econometrics, Tijuana, Mexico, November 2005.

Brian Skyrms

Paul Silverman Award.

George Sperling

Editorial Board: Journal of vision.
Acting Editor, reviewer: Numerous journals, especially PNAS, vision Research.
Support postdoctoral fellow: Chia-huei Tseng and partial support for postdoctoral fellow: Jian Ding.

Hal Stern

Associate Editor, Bayesian Analysis.

Member, National Academy of Sciences Panel on American Community Survey (summer 2004 – winter 2006).

Committee to Visit the Department of Statistics, Indiana University.

Mark Steyvers

Member of Editorial Board for Journal of Experimental Psychology: Learning, Memory, and Cognition.

AAAI-06 Program Committee Member, National Conference on Artificial Intelligence.

Courtesy Appointment as Associate Professor, Computer Science Department, University of California, Irvine.

Courtesy appointment as Associate Professor, Department of Psychology and Social Behavior, University of California, Irvine.

Douglas White

Invitations as: Guest-in-Residence, Max Planck Institute for Social Anthropology, Halle, Germany; Collegium Guest-in-Residence, Institute for Advanced Study, Budapest, Hungary; and Guest-in-Residence and Visiting Faculty, School of Social Science Sciences, University of Ljubljana, Slovenia.

Asked by the Max Planck Institute for Social Anthropology in Germany to develop an analytic guide for the network component of a 4€ million Euro 8-country European Union project with 19 full-time researchers on Kinship and Social Security.

2006 review in the International Journal of Middle East Studies cast critical acclaim on "what could be the most important book in anthropology in fifty years," White and Johansen's 2005 book, Network Analysis and Ethnographic Problems: Process Models of a Turkish Nomad Clan.

External Faculty, Santa Fe Institute. Second year of a 3-year renewable appointment.

Council Member, European Complexity Science Society, 2005-2009.

Steering Committee, European Complexity Science Conferences, 2005-2009.

Editor-in-Chief, *Structure and Dynamics: eJournal of Anthropological and Related Sciences,* UC eScholarship Publications.

Jack Xin

AMS Hour Lecture Speaker, Oct, 2005.

Editorial Board of SIAM Interdisciplinary Journal: Multiscale Modeling and Simulations, Nov, 2005.

Hongkai Zhao

Editorial Board, Journal of Computational Mathematics.

Editorial Board, Computational & Applied Mathematics.

APPENDIX F
GRADUATE STUDENTS AFFILIATED WITH IMBS

(i) Current Student Participants and their IMBS Advisors
(* advanced to Ph.D. candidacy; ** received Ph.D. during year)

	Student	Advisor
	Amer Aladhad	Saari
	Joaquin Artes	Brownstone/Glazer
**	Garrett Asay	Saari/Brownstone
	Eric Aysenshtat	McBride
*	Anna Bargagliotti	Saari
	Jerry Benzl	Kaminski
*	James Bono	Saari
	Dan Cavagnaro	Falmagne
	Aditya Chauhan	McBride
	Chi Chun Chan	McBride
	Busik Choi	Brownstone
	Xian (Daisy) Deng	Brownstone
	Steve Doubleday	White
	John Ensch	McGann
	Amy Escobar	Hoffman
*	Tianjun “Mike” Feng,	Keller
	Nathan Fiala	McBride
	Seiji Fujii	Glazer
**	Ma Ge	D’Zmura
	Shaw Gillespie	Braunstein
*	Fang Hao	McBride
	Arvin Hsu	Sperling
	James Hsu	Kaminski
*	Hao Jia	Skaperdas/Grofman
*	Rolf Johansson	Narens
	Steven Kies	Chubb
	Rueben Kline	McGann/Grofman
**	Jason Kronewetter	Saari
	Julie Kwak	Hoffman
*	Michael Latner	McGann
*	Lingfang Li	Saari
*	Iris Lien	McBride
	Shiau Hua Lin	Dosher
*	Songting Luo	Zhao
*	Matthew Mahutga	Boyd
	Ray Mendoza	Komarova
	Yan Mu	Small
*	Chen Ng	Small
	James Nolen	Xin
	Kerem Ozkan	Braunstein
	Brendan Purdy	Batchelder/McBride
	John Pyles	Hoffman
**	Gang Qui	Skaperdas

	Archana Raghunathan	Steyvers
	Jay Simon	Keller/McBride
	Rory Smead	Skyrms
	Kejun Song	Small
*	Alex Strashny	Batchelder
*	Jared Smith	Batchelder
*	Laurent Tambayong	White
*	Amjad Toukan	Skaperdas
	Bao Truong	Hoffman
**	Yogesh Uppal	Glazer
	Mike Yi	Brown/Iverson
*	Kevin Zollman	Skyrms
*	Yi Zhou	Brownstone

(ii) MA Degrees in Mathematical Behavioral Science during academic 2004-05

Rolf Johansson
Kevin Zollman
Nathan Westbrook
Lingfang (Ivy) Li

APPENDIX G
VISITORS' LETTERS