IRVINE: INSTITUTE FOR MATHEMATICAL BEHAVIORAL SCIENCES
SCHOOL OF SOCIAL SCIENCES

ANNUAL REPORT
2011-2012

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Director's Statement:

Dear IMBS Colleagues and Selective UCI Administers,

This annual statement is being written with a heavy heart: Only recently Duncan Luce, an intellectual giant, a person who was a good friend as well as an academic hero to many of us, and the founding director of the IMBS died. His research, his insights, his development of a branch of mathematical psychology, his contributions to so many areas, have changed the way in which we think about so many topics; they will ensure that his name will remain within academic history. More personally for the IMBS, is that Duncan's vision for our institute was to create something new—an academic research setting where the power of mathematics would be used to provide insights and find answers for those complex issues that come from the social and behavioral sciences. His objective, his dream remains in the forefront of the IMBS objectives and activities.

As we have learned, in order to achieve this goal, it is necessary for the IMBS to continually reinvent itself; to take risks where we examine topics not normally discussed, but doing so while maintaining our strong ties with more traditional themes. As a couple of recent examples, we now are learning that a powerful way to address problems confronting society is with social norms. The IMBS is fortunate to have a subgroup that is on the cutting edge of this research issue. But, there are other mysteries, such as the power of religious norms—not religions, but the norms and religious attitudes that affect all societies. Where do they come from and can they be understood? In January, the IMBS hosted a conference/workshop to examine these questions and connections with the social norm literature.

"Dynamics" is a central part of the social sciences; this is understandable because all of the social sciences involve "change." But, the dynamics in the social sciences differs from what is common in the physical and engineering sciences. This suggests that it is reasonable for the IMBS to explore how such differences in dynamics occur and affect other concerns. A step in this direction was with a Fall conference/workshop on the theme of "The dynamics of infectious diseases."

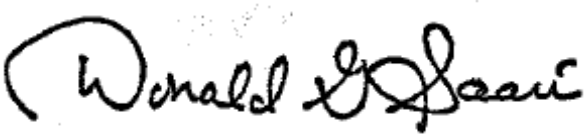
A long standing theme within the IMBS is to understand how decisions are made and how they should be made. Group decisions typically involve voting. But, as research coming primarily from the IMBS has established, one must be very wary of the choice of a decision/voting method; the outcome can more accurately reflect the choice of a rule rather than the views of the voters. To take advantage of interests in this topic ranging from economics, political science, cognitive sciences, and mathematics, a new weekly discussion group explored new results and directions.

The above, of course, is in addition to standard activities. Indeed, I highly recommend that the reader look over this report to get a sense of the many advances made by IMBS members over the last year. They are impressive and diverse achievements. Also, I recommend that the reader look over the papers published, conferences organized, and the many other activities of the IMBS and its members.

On a different note, this is a year of change. I will be on leave for the academic year, and Stergios Skaperdas has graciously agreed to be the Interim Director during that time. Stergios will be putting forth some new ideas, and I urge you to participate.

A major IMBS change is that our institutional memory, our consistency, our glue holding all of our different projects together, Janet Phelps, retired as of July 1, 2012. Janet has been with the IMBS before the beginning; she was working with Duncan on the establishment of the IMBS, and she has been a valued member ever since. But, we are fortunate; Janet agreed to serve halftime for this coming academic year. We thank you.

Sincerely,



Donald G. Saari
Director, IMBS

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. 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 an Administrator. 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 Director:	Louis Narens
Administrator:	Janet Phelps

Saari is on leave during the 12-13 academic year. Stergios Skaperdas will be the Interim Director.

B. Executive Committee 2011-12

Carter Butts, Associate Professor of Sociology
Geoff Iverson, Professor of Cognitive Sciences
Marek Kaminski, Associate Professor, Political Science
Michael D. Lee, Professor and Chair, Cognitive Sciences
Mark Machina, Professor of Economics, UC San Diego
Brian Skyrms, Professor of Philosophy

For the academic year 2012-13, Kaminski and Skaperdas are rotating off of the committee and will be replaced by Anthony McGann and Michelle Garfinkel.

II. RESEARCH

A. Current Research Programs

The 66 members of the Institute for Mathematical Behavioral Sciences (IMBS) and their research interests are listed in Appendix A.

The IMBS is roughly partitioned into five research clusters. These are listed below and should be considered as informal intellectual groupings, rather than formal structures.

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

2. ***Statistical Modeling**:*
   ***Cognitive**:* Baldi, Batchelder, Dosher, Eppstein, Falmagne, Lee, Iverson, Riefer, Romney, Smyth, Steyvers, and Yellott
   Economic: Brownstone, Poirier, Saari, and Small
   Sociological/Anthropological: Boyd, Butts, Faust, Freeman, and White

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

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

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

B. Publications

The members who have replied report a total of 221 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 7 technical reports issued during the academic year. Technical reports since 1993 can be found under "printed resources" on the Institute'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 162 talks listed in Appendix D. Their awards and achievements for this year can be found in Appendix E.

D. Summaries of Research 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

In addition to ongoing work in Multinomial Processing Tree Modeling and Cultural Consensus Theory, I am a co-author with Hans Colonius, Ehtibar Dzhafarov, and Jay Myung of *The New Handbook of Mathematical Psychology* to be published by Cambridge University Press. So far we have contracts for two volumes, and we anticipate more to come.

Jean-Claude Falmagne

*The presidential Race***.** In collaboration with Cristina Lopez, Associate Professor in Computer Sciences and Matthew Beckmann, Associate Professor in Political Sciences, and some of their, I am developing an internet game closely mimicking the presidential election in the US. Each of the players compete to become the president. The game is based on a board game that I copyrighted in 1986.

Decision-Making

Duncan Luce

My collaborator Ragnar Steingrimsson and I have begun trying to think through a theory of rating scales, e.g., the 1-10 pain scale. Such scales are in very common use, but no adequate theory has been offered. For example, many have tried to address their scale type: ordinal, ratio, absolute? Our conjecture is that they are best thought of as simple counts in the sense that the respondent in some way partitions the subjective intensity scale into n intervals, and simply assigns numbers to these intervals in their natural order. So, the problem is: what is the nature of the partitioning principle?

Two possible conjectures formulated in terms of Luce's global psychophysical theory are equal subjective intervals and equal subjective ratios. So, our plan is to collect sizable amounts of data from individuals that show how the defining intervals seem to be located when the respondent is repeatedly rating signals on a dimension such as loudness or sweet-sour. Hopefully, we will complete some of this work during the remaining months of our AFOSR grant.

Louis Narens

This year I concluded a three year grant from the Air Force Office of Scientific Research (AFOSR) with a 1-year extension. I was the PI on this grant with Brian Skyrms as Co-PI. The grant developed alternative foundations for probability theory and applied them to decision and game theory. I applied for a new, somewhat related grant, from AFOSR. It is for developing new mathematical foundations for probability theory using algebraic lattice theory and relating these theories to new kinds of psychological mechanisms for processing uncertainty in making decisions under uncertainty. My proposal is been recommended for funding at the board level, and is awaiting a final decision from other parts of the Air Force bureaucracy

Most of my research effort went into a book on alternative probability theories that I plan to finish and publish during the 2012-2013 academic year. I published one article, L. Narens, J. A. Jameson, N. L. Komarova, and S. Tauber. Language, Categorization, and Convention, in the Journal, *Advances in Complex Systems*.

Perception and Psychophysics

Kimberly Jameson

In 2011, I received a UC Pacific Rim Research Program grant to develop a new color categorization database and to compile data and study variations in color categorization among Pacific Rim cultures with colleagues at UC Berkeley's International Computer Science Institute.

Perceptual color experience is universally appealing, “without” it our visual lives would consist of monochrome shades of gray. But despite many similarities, a number of linguistic societies categorize and apply meaning to perceived color in ways that differ from the familiar associations learned by English language speakers. This raises the question: What are the cognitive factors that influence the assignment of linguistic categories to conceptual domains such as everyday color experience? Jameson explains, the ways individuals classify color depends on, among other things, the uses and importance of color in our everyday visual processing environments and the ways different societies of people develop meaning systems on the rather uniform domain of color perception can tell us a lot about cognition, communication, perceptual processing and environmental color salience and utility.

This region is of particular linguistic interest and is in the spotlight because an archive of raw data by the late cognitive anthropologist, Dr. Robert E. MacLaury, will through this project be made accessible for the first time to the general research community. This unique archive includes the Mesoamerican Color Survey, which draws from interviews with 900 speakers of some 116 Mesoamerican languages. With UC funding and newly granted access to MacLaury's archive, I will lead the effort to create a publically accessible, analyzable database of MacLaury's color survey in conjunction with consulting scientists Paul Kay, Terry Regier and Richard S. Cook, of the International Computer Science Institute at UC Berkeley. The resulting extensive web accessible database will be made available to scientists alongside the existing World Color Survey database. The World Color Survey (2005, 2009) and its sister publication Basic Color

Terms: Their Universality and Evolution (1969) by Brent Berlin and Paul Kay, are currently the most cited references for color categorization, and, according to experts in cognitive anthropology, may be the most influential research of the last fifty years carried out by social anthropologists.

In general, large-scale cross-linguistic comparisons of cognitive representation of meaning are often difficult to undertake because of the rarity of this kind of data. Pairing the World Color Survey with this new database will make available, in digital format, a mountain of data to interdisciplinary researchers of color categorization, naming and cognition

Vladimir Lefebvre

Over this last year, I have worked on a book with a tentative title "What is mental experience?" devoted to the relation between physical and psychological aspects of cognition.

Lisa Pearl

One set of important findings concerns the biological underpinnings of the human language faculty. The knowledge of how to use *one* referentially in English (e.g., Look - an important finding! Here's another *one*!) is one linguistic example previously thought to implicate innate knowledge of language in humans. Specifically, since experimental data demonstrates that young infants seem to have correct intuitions about how to interpret *one*, it was thought that only by having innate knowledge of how to interpret *one* could children learn this knowledge as quickly as they do. However, my mathematical model demonstrates that this is not necessary - the same behavior can be generated by using probabilistic learning abilities applied to infants' linguistic input. In addition, the modeling work highlights that acquisition of the adult intuitions may in fact be a two stage process, with the experimental data available marking the end of the first acquisition stage rather than the end of both acquisition stages.

Another finding in a similar vein involves the structure of linguistic dependencies, such as "What do you think convinced them?", where "what" seems to be understood also as the subject of the embedded clause "convinced them". Adult intuitions about the full range of grammatical and ungrammatical linguistic dependencies were thought to require innate knowledge of language in humans. However, a mathematical model based on very simple premises (none of which necessarily involve innate knowledge of language) can produce the observed adult intuitions. This suggests that knowledge of linguistic dependencies is not something that must be part of a biological endowment for language in humans.

A third finding involves how people use language to communicate in text. In particular, this work seeks to identify *writeprints* for individuals, which are unique combinations of characteristics that mark people's writing styles. Writeprints can be used to identify cases of *authorship deception*. For example, suppose someone is attempting to conceal their identity (perhaps by posting anonymously online or stealing someone else's user account and posting under that person's name) - our current models achieve an 89% accuracy rate at detecting this deception (i.e., 9 out of 10 times, we can tell if it's you doing the writing or not). These

writeprint-based models can also be used to identify imitation attacks, where someone consciously attempts to alter their writing style to match yours and pose as you. Our current model can tell imitators from the real thing 100% of the time, based on current realistic samples of imitation attacks.

A fourth related finding concerns the automatic identification of the tone of text, using linguistic cues within the text (rather than non-verbal cues such as voice pitch or facial expression). For example, "C'mon - you should read this!" is clearly persuasive, and some distinctive cues include the use of the contracted form "c'mon" and the use of a second person pronoun ("you") followed by the modal verb "should". This kind of automatic tone detection could be quite useful in email and text messages, where something like a “tonechecker” could be developed to accompany the already existing spellchecker and grammarchecker software that is standard. Using only shallow linguistic features (such as the ones above for a persuasive tone), we were able to identify a message's tone correctly 70% of the time, which is nearly as good as humans are able to reliably do. To improve tone detection further (beyond human levels), we plan to use more sophisticated linguistic features in future research that may tap into the deeper levels of linguistic knowledge that humans use when generating messages.

Jack Yellott

In collaboration with Andrew B. Watson of NASA's Ames Research Center, I have been working on a formula to predict the size of the human eye pupil as a function of variables that are known to control that size: stimulus luminance and area, observer age, and monocular vs. binocular viewing. Pupil size plays a critical role in determining the optical quality of retinal images, and it would often be useful to be able to predict it for instrument design and other purposes. Our formula builds on earlier ones in the literature dating back to the 1920s, but incorporates more factors, and should be more accurate.

Jack Xin

I worked and published papers on multi-microphone speech enhancement methods, blind and semi-blind source separation methods for recovering chemical compounds from their mixtures(blind means no knowledge of the mixing conditions), and analysis/computation of turbulent flame speeds in level-set Hamilton-Jacobi equations related to the understanding how fast fires spread in the winds.

Social and Economic Phenomena

(a) Economics and Game Theory

William Branch

The Great Recession of 2008-2009 featured very low rates of inflation and a large economic contraction. In response, the Federal Reserve aggressively lowered interest rates, eventually bumping up against the zero lower bound on nominal interest rates. Since interest rates cannot go below zero, this hindered the effectiveness of monetary policy. An increasingly popular

proposal to avoid hitting the zero lower bound in future recessions is for the Federal Reserve to target a higher average inflation rate thereby providing more room for the central bank to lower interest rates. Most research suggests that there is a tradeoff between the stability of higher inflation targets – which make hitting the zero lower bound less likely – and the inefficiency of inflation. However, the stability results that arise in the literature assume that the Federal Reserve is able to perfectly communicate their long-run inflation target and that households and firms completely understand the implications of that target when making economic decisions. In recent research, I re-examine the stability of higher inflation targets in an environment with imperfect information. I find that higher inflation targets lead to economic instability as households and firms may occasionally misinterpret temporarily higher (lower) inflation as a change in the Federal Reserve's inflation target.

David Brownstone

I have been working on a project to analyze the new US vehicle fuel economy standards. These standards require knowing very detailed information about vehicle attributes such as weight, horsepower, etc. As a result, there is no way to exactly identify vehicles chosen by households from standard household survey techniques. We have therefore developed statistical techniques to deal with this uncertainty and applied these techniques to estimate the demand for hybrid fuel vehicles purchased between 2006-2009. We find that the impact of uncertainty in vehicle identification is large (resulting in increasing confidence bands by a factor of more than 4 in some cases), but we are still able to find that households have a strong preference for higher fuel economy but also have a strong aversion to hybrid vehicle technology.

Jan Brueckner

Some of the world's most dramatic land-use restrictions are found in India. Cities in that country impose draconian building-height limits, which enforce low-rise land-use patterns in urban areas that would otherwise resemble the high-rise metropolises of Hong Kong or Singapore. Various explanations have been offered for India's use of stringent height restrictions, but whatever the motivation, urban economic theory shows that a height limit has far-reaching impacts on city that go beyond its direct effect on the skyline. Housing prices rise and the city expands spatially in a natural response to the land's restricted ability to accommodate the urban population. Urban residents are made worse off through a combination of higher housing prices and longer commutes to the center. A previous theoretical paper of mine shows that an exact monetary measure of the per capita welfare loss is given by the increase in commuting cost for a resident living at the now-more-distant edge of the city (the housing price is unchanged for this resident). The goal of this new research is to quantify this effect by measuring the *welfare gain* from a *relaxation* of the height restriction in a typical Indian city. This exercise is carried out by first estimating the empirical relationship between the spatial sizes of Indian cities and their height limits, which shows the expected inverse relationship (higher allowed heights means a smaller urban land area). Using the estimated height-limit coefficient, the reduction in land area, and thus the reduction in distance to the city's edge, from a moderate increase in the limit can be computed. Then, using an independent estimate of commuting cost per kilometer, the reduction in the edge resident's annual commuting cost can be computed, giving the per capita welfare

gain. Finally, this gain is scaled up by the city's population to get the aggregate consumer welfare gain. This gain is about 350 million rupees for an Indian average city with a population of three-quarters of a million. For the US, a gain representing the same percentage of household income would be $260 million for city of this size.

Jean-Paul Carvalho

My work over the last year has focused on the economic origins of cultural change. In a paper titled 'Veiling', I provided a game-theoretic explanation for the rise in veiling (concealing modes of dress) among Muslim women since the 1970s. Migration---both internal and external---and changes in education and labor market institutions have provided Muslim women with enhanced economic opportunities. Taking up these opportunities, however, can come at the expense of social status in conservative communities. I argue that veiling acts as a commitment mechanism, credibly committing women to abiding by the norms of their community even while interacting outside its monitoring range. In this way, veiling enables women to exploit economic opportunities while maintaining esteem within their community. I show that a ban on veiling in public spaces can surprisingly lead to lower levels of integration and greater religiosity among Muslims.

I have also completed two papers on Jewish emancipation in 19th century Europe with Mark Koyama (George Mason University). More or less homogenous communities responded in drastically different ways to emancipation. In Germany, a liberal variant of Judaism emerged, while in Eastern Europe traditional Judaism was reworked into various forms of orthodoxy, including ultra-orthodox Judaism. We propose two complementary explanations for the polarization in Judaism which occurred following emancipation. Each paper provides a theoretical framework that can be used to understand other forms of cultural polarization.

Finally, I have completed a paper titled 'Faith-Based Organizations' which provides the first model of group-based activity that combines club goods provision, competition and interactive belief formation. The paper predicts that moderation of a religious establishment by the state can lead to entry by new religious groups who grow more extreme as the establishment becomes more moderate. On this basis, I suggest an explanation for the rise of new and more extreme religious groups in Egypt since the 1970s.

Robin Keller

Childhood vaccines are our best public health strategy for disease prevention; yet, an increasing number of parents are refusing to vaccinate their children. One factor contributing to parents' fear of vaccines may be the presentation format used to inform parents about the probability of vaccine-related side-effects. We analyzed vaccine information sheets provided by Centers for Disease Control and Prevention (CDC) and found side-effect probabilities were most often described using a 1-in-X probability format. However, in a between-subjects experiment involving (N = 284) parents we found that representing side-effect probabilities graphically and numerically (Pictograph + N-in-X*N format) resulted in lower perceived vaccine risk than when representing side-effect probabilities numerically in either a 1-in-X format or an N-in-N*X

format. Our results suggest that including pictographs alongside numeric probability information within vaccine risk communications may lessen parents' vaccine-related risk perceptions.

Natalia Komarova

With my IMBS colleague K. Jameson I have continued to work on problems of human color perception. In particular, we studied perceptual models of color spaces, and their relevance for high-level human cognitive tasks, such as odd-one-out triad choices. Such tests commonly used in color research allow for an interesting geometric interpretation. Using K. Jameson's human observer data, we showed that the usual CIE color model can be modified to include perceptual biases (such as the categorization bias, and the lightness-saturation bias) to incorporate a systematic variation in the human responses observed.

In collaboration with D Wodarz I worked on the interesting problem of cooperation in the context of division-of-labor games. We were able to show that cooperation can increase the speed of evolution (that is, increase the rate at which fitness valleys are crossed). Moreover, we showed that the presence of defectors helps accelerate evolution even more.

Other topics of my research have been coinfection and synaptic transfer of viruses, habitat fragmentation in host-pathogen systems, and stochastic modeling of stem cell dynamics.

Igor Kopylov

In a joint paper with J. Noor, I have identified and modeled a distinction between hard and soft types of commitments. The former type requires a physical barrier for tempting consumptions, while the latter just imposes a monetary or emotional punishment on such consumptions. The large theoretical literature on temptations focuses on hard commitments, but intuition and anecdotal evidence suggests that most real-life commitments are soft. Besides the formal framework, our model deviates from the literature on a more subtle behavioral issue. Does the use of soft commitments (e.g. monetary fines) strengthen or weaken the subsequent desire for hard commitments? All standard theories suggest that sufficiently large monetary fines or emotional penalties should make temptations no longer tempting and hence, eliminate the need for hard commitments altogether. By contrast, our model makes an arguably more intuitive prediction: regardless of previous soft commitments, self-control remains costly and hence, hard commitments are still desirable. In a separate experimental project (joint with M. Caldara), I seek to find a solid empirical support for the above claim.

Simon Levin

The Dynamics of Biodiversity and Biocomplexity

(1) I have been working for the past several years on the Second Edition of the *Encyclopedia of Biodiversity*, for Elsevier. The latest edition will have more than 400 articles, and work is now basically complete. The *Encyclopedia* will appear in January.

(2) With graduate students Carla Staver and Sally Archibald, I published a series of papers in *Ecology*, *Science* and *PNAS* documenting, through data analysis and modeling, the bistable nature of savanna-forest systems, and the role of fire in mediating critical transitions between savannas and forests. In the *PNAS* paper, we examine the paleoecological record, and assess the role of humans in transforming landscapes.
(3) With postdoctoral fellow Juan Bonachela and M.A. Muñoz, published a manuscript in the *Journal of Statistical Physics* on the incorporation of demographic stochasticity in models of pattern formation in a variety of systems. Ignoring such stochasticity, as we show, can lead to fallacious conclusions about pattern.
(4) With postdoctoral fellows Bonachela and Miguel Fortuna, published a paper in *PNAS* showing that the successful evolution of software systems mimics biological evolution, and relies upon the emergence of modular structures.
(5) With postdoctoral fellows Bonachela and Michael Raghib, published a paper in *PNAS* introducing a fundamental modification, allowing for phenotypic plasticity, in models of nutrient uptake among marine phytoplankton. We are currently, with a number of collaborators, incorporating this formulation in models of ocean ecosystems, and believe it can lead to modifications on the order of 20% in estimates of uptake.

The Interactions Between Ecological Systems and Socioeconomic Systems, and the Management of Natural Resources

(1) A major threat to biological diversity is posed by the construction of new dams in the Mekong Delta. We (led by my postdoctoral fellow Guy Ziv) completed an analysis of 27 tributary dams planned for construction between 2015 and 2030 and estimated that the effects of those tributary dams would be more damaging to fish biodiversity, with less benefit, than planned mainstream dams. The surprising results were published in *PNAS*, and have attracted much attention.
(2) With graduate student Eili Klein and others, I published two articles on malaria dynamics, including an analysis that emerged from an undergraduate project on the quality of easily available antimalarials in Ghana, as well as a deeper study of the way the immune system mediates the interaction between different malarial strains.
(3) With Avinash Dixit and Dan Rubenstein, completed and submitted a manuscript on sharing of the Commons among East African herdsmen. We compute the collective optimal arrangement, examine its stability from a game-theoretic perspective, and, when it fails, compute the second-best solution that can be sustained. Furthermore, I published a paper with a former visiting student and postdoc, Alessandro Tavoni and Maja Schlueter, on how social norms can help enforce cooperation in the sharing of common pool resources.
(4) With Tom Espenshade and others, published what we think is a fundamental paper on deconstructing demographic "momentum" into its component parts. This theoretical analysis was applied to data on a number of countries, and published in *Demography*.
(5) With Iain Couzin, Naomi Leonard and others, published a series of papers in *PNAS*, *Science* and elsewhere showing the importance of unopinionated individuals in the development of consensus in animal groups, and arguing that similar phenomena are important in collective decision-making in human populations.

Michael McBride

The evolution of cooperation has been widely studied, but with less attention given to adversarial settings wherein one actor can directly harm another. Recent theoretical work examines a stylized adversarial setting: one actor can victimize another, the victim can report the crime, and the rate of conviction depends on the overall societal propensity to act as witnesses to the crime. Previous evolutionary game theoretic analysis of this adversarial setting, including work done by myself and co-authors, reveals that the emergence of cooperation from low crime initial conditions requires the presence of actors, dubbed Informants, that both commit crimes and punish criminals. We experimentally study this adversarial environment in the laboratory to test if Informants are indeed critical for the emergence of cooperation. We find that Informants are necessary for the emergence of cooperation: when crime is high, the Informant strategy is a transitional strategy from committing crimes to not committing crimes; when crime is low, the Informant strategy is a deviation that reinforces overall cooperation. A key lesson is that successful transition from high crime settings requires the cultivation of Informants.

Dale Poirier

My research continues in applying Bayesian techniques to econometric models.

Donald Saari

A main theme in my research involved the "reductionist" argument whereby the complexity of complex settings is reduced by dividing the problem into parts, the parts are then analyzed, and answers for these parts are then combined to explain what happens in the "whole." After proving a theorem, which casts serious doubts on whether this can be done in general, these conclusions have been applied to a variety of settings. This includes a new explanation of Arrow's Theorem, applications to concerns that come from engineering, perversities that can arise in law, voting theory, and even an analysis of the "dark matter" controversy coming from astronomy. As my result proves, the reductionist approach must be supplemented with ways to connect what happens with the various parts. An approach using differential geometry is being developed to hand this concern.

Kenneth Small

Engineering studies demonstrate that traffic in a dense street network often encounters "hypercongestion," where higher traffic density actually reduces the volume that can be accommodated. Work with Mogens Fosgerau of Technical University, Denmark, finds that when this occurs, traffic behaves as though vehicles are queued up behind a bottleneck whose capacity declines when the queue is large. Solving the resulting model leads to several insights, including that the effect on congestion of adding a traveler is especially sensitive to the lowest level of capacity reached. Also, policies such as tolls and metering have larger benefits than are usually calculated, and can be designed so that travelers gain even aside from any benefit from the use of toll revenues.

(b) Public Choice

Anthony McGann

I have developed an algorithm to estimate the position of the median voter or the “policy mood” (how far public opinion has moved “to the left” or “to the right”) from aggregate data. We have many opinion poll questions asking people their views. The problem is the same questions are not asked every year, although (crucially) there is some overlap. I develop a technique from psychometrics (item response theory) to produce a single measure of public opinion for this array of questions. I have applied this to public opinion in the United Kingdom. The algorithm will be of use in many contexts and countries.

Social Choice and Political Gerrymandering. In the case *Vieth v. Jubelirer* (2004) the Supreme Court decided that courts could not prohibit the gerrymandering of Congressional districts to benefit one party over the other. This finding was based on the argument that the US Constitution does not grant rights to equal representation to groups, but only gives rights to individuals. However, using social choice theory, I have proven that any districting scheme that does not allocate a majority of seats to a party that wins a majority of the votes necessarily fails to treat all voters equally. Therefore political gerrymandering does violate individual, as opposed to group, rights.

Rein Taagepera

While IMBS members use vastly more sophisticated approaches, the hard fact is that all too many quantitative articles published in social sciences are limited to linear regression or only slightly more advanced techniques, often applied without actually understanding their pitfalls and limitations. In particular, the logical thinking that should precede and follow computerized analysis is lacking. I am trying to improve this condition through broad-circulation articles ("Adding meaning to regression”, in European Political Science) and reworking a basic textbook manuscript ("Logical Models and Basic Numeracy in Social Sciences"), which I used in 2012 in undergraduate courses at UCI and at the University of Tartu, Estonia. Enhancing the basic level of quantitative understanding in social sciences is needed so as to maintain some degree of connectedness to IMBS-level research.

(c) Social Networks

Michael Burton

What I have been doing is developing a new approach to teaching research methods to our anthropology PhD students. This has been the third year of development of the course. It is a two-quarter sequence that integrates the teaching of research design and statistics. Teaching statistics emphasizes the history of statistics, including explanation of the development of the difference statistical paradigms that are now associated with the major disciplines. In teaching this course I have found that students gain a much better understanding of statistics if it is not taught just as a set of mathematical models. Instead learning statistics is linked with discussion

of the research design choices that are associated with different statistical models. This does mean that the students learn less in the way of the mathematics, but they get a much better understanding of work in different scientific disciplines that uses different statistical models.

The spring quarter emphasizes methods that have proven useful within the fields of social and cultural anthropology. These include measurement models such as multidimensional scaling and correspondence analysis, networks methods (including network sampling), and statistical models that are used in anthropology, such as logit analysis. .

During the next six months I will be working on turning the course notes into a short text on statistics and data analysis in the field of anthropology.

David Eppstein

It has long been observed in real world social networks, starting with the famous Milgram experiment, that actors in the network are separated from each other by short paths (the so-called small world property) and moreover that simple greedy routing schemes, based on actors' knowledge of their membership in social categories, can succeed in finding short routes. We formalize the knowledge needed to participate in such a routing scheme by the membership dimension, the maximum number of categories that any individual participates in, and we show that there is a category system that can support greedy routing with small membership dimension if and only if the underlying social network has the small world property.

Katherine Faust

My research concerns the comparative study of social organization with a focus on local social network structure for various animal species and forms of social relations.

Andrew Noymer

I work on the area where two complex systems interface: Epidemiology. While work on the spread of diseases is now a well-elaborated sub-field of mathematical biology, the complex social system also affects who gets diseases, when, and with what severity. As a sociologist/demographer, I work mostly on social and historical epidemiology, though some of my work straddles this area and methodological and modeling concerns. I continue to do much work on influenza pandemics, the subject of my PhD dissertation (2006). The impact of pandemics is socially-mediated: in 1918, my work shows that the *subsequent* epidemiology of tuberculosis was affected by the pandemic. This points to a disproportionate impact on the tuberculous (disproportionately, then as now, a poor group) by the influenza pandemic. My work covers other aspects of social and technical epidemiology. Among other ongoing projects, I am beginning a series of technical papers on influenza epidemiology, the first of which are under review as of this writing.

(d) Social Dynamics and Evolution

Douglas White

The past few years have led to unprecedented breakthroughs in the mathematics of data analysis with open source modifiable software that allowed research, publication, and grant proposals on improvements in Bayesian and inferential statistics to support testing of networks of causal variables from data on human societies and historical sequence data that have major policy implications (White 2012a, in press). With MBS students Oztan, Gosti and Wagner, visiting grad student Ren Feng (White, Feng, Gosti and Oztan 2011, White, Oztan, Gosti, Wagner and Snarey 2011) and researchers at the Santa Fe Institute, where I expanded the Working Group on Robust Causality in the Social Sciences (WGRCSS), we have made rapid progress in the last two years (in collaboration with postdocs Marcus Hamilton and Laura Fortunato, external faculty Wright and Turchin, and invitees Boehm and Johnson) on a Societal Study Initiative for assembly and analysis of major comparative and historical databases on human societies and in the assembly, theory development for societal processes and network analysis, and robust causal modeling and model testing using SSI databases (White 2012b). Work on a grant proposal for the collaborative work at SFI has led to three book manuscripts. White and WGRCSS (draft 1) examines the evolution of human cooperation in forager societies, and (draft 2) examines the evolution of ethics in monotheistic religions, given the findings of our SFI WGRCSS findings (White, Oztan, Gosti, Wagner, and Snarey 2011). Our newsletter for the IMBS Structure and Dynamics research group (White, Oztan, Feng 2010) details our SFI meetings and invitation to present WGRCSS papers at the Leipzig Max Planck Institute for Mathematics and the Sciences. White, Dow and Eff (2013) provides a book contract for original articles on the transformation of cross-cultural research using the new approaches of the last five years, including the work of the WGRSS, which will also include computer-based instructional packages (White 2012b), network approaches to comparative study (White 2011a, 2011b), and the links between human cognition and social networks (White 2011c).

E. 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]
- Theory, History and Development [Carvalho]
- Models of Ecology and Evolution [Frank]
- Signaling [Huttegger/Skyrms]
- Voting Theory [Kaminski]
- Workshop on Bayesian graphical modeling methods for Cognitive Science, University of Amsterdam, August 2011 [Lee]
- Philosophy of Perception [Maddy]

- Category theory as a foundation, reading course [Maddy]
- Democracy and Conflict [McBride]
- Macropolitics [McGann]
- Language Acquisition [Pearl]
- Social Dynamics [Saari, Skyrms and Narens]
- Methods and Models [Saari, Narens]
- Political Economy [Saari]
- Transportation Economics [Small]
- Colloquium in Transportation Science Faculty [Small]
- Kuhmo-Nectar Summer School on Transport and Urban Economics [Small]
- Molde University College, Molde, Norway: Graduate course in Transportation Economics Seminar in Logistics [Small]
- Summer School in Environmental and Energy Economics, University of California Center for Energy and Environmental Economics [Small]

INTER-DISCIPLINARY READING GROUP SPANNING UC SCHOOLS (UCI & UCLA): COMPUTATIONAL MODELS OF LANGUAGE

Assistant Professor of Cognitive Science, Lisa Pearl, continues her discussion group on computational models of language spanning multiple UC Schools. The group meets every two weeks to discuss topics concerning computational models of language, including mathematical models of language acquisition by humans and models of information extraction from language by humans. Topics of interest include: computational models of language learning/acquisition; computational learning theory; principles underlying models of language learning and change; modeling information extraction from language by humans.

More information can be found at: http://www.socsci.uci.edu/~lpearl/colareadinggroup/

SOCIAL DYNAMICS AND COMPLEXITY RESEARCH GROUP

The focused research group in Social Dynamics and Complexity, headed by Professor Douglas White, has a mediawiki InterSciWiki web site for complexity, dynamics, and network sciences, 16 core members and 13 affiliates. It has a 7 year-long track record in biweekly videoconferences across five UC campuses, and on-demand streaming replays of speakers in complexity social sciences and student/faculty discussions. The “idea is to have interdisciplinary and intercampus graduate seminars” carried out without the need of any formal institutional funding or administration. Each subgroup in this loose teaching/research network has their own graduate students, and undergraduates participate as well. Two previous years of these streaming videos at iTunesU are publically available at the group’s InterSciWiki website. The peer-reviewed e-journal of anthropological and related sciences, Structure and Dynamics, continues, and has now published 61 open access articles, widely cited (57,400, Google:hits, up from 1,850 last year), 206 Google Scholar listed articles, and 62,140 downloads. The group was the subject of a featured article by UCOP and the President's Office of Berkeley electronic Press, and is featured in the Anthropology News (AN) newsletter. The group hosts a newly created UC

eRepository version of World Cultures: eJournal of Cross-Cultural Research that has published six issues with 22 articles but already has 1,780,000 Google:hits (up from 1,450), 61 Google Scholar listed articles, 12,502 downloads, and will publish 16 legacy issues while it moves forward with new issues. The group has initiated EduMod sites on its InterSciWiki for open access instruction in a variety of research methodologies, from structural cohesion in social networks to causal analysis with Peer effects. It is in as second round of Templeton Basic Science grant submittals for intermeshed projects of the group's Societal Study Initiative and Working Group on Robust Causality in the Social Sciences projects.

SOCIAL NETWORKS 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 Social Network Research Group (SNRG) meets weekly during the academic year, and serves as an open forum for research presentations, meetings with visiting researchers, and discussion of current research. The group consists of a mix of faculty, students, and non-student researchers from the UCI community, as well as outside visitors, and is open to all interested parties. More information and past agendas can be found at: http://erzuli.ss.uci.edu/network/

In addition to open discussions, the following research presentations were given this year:

FALL 2011

October 4

The ASFP Two Communities Study: A First Look [Adam Boessen and the ASFP Team]

October 11

Approximate Sampling for Binary Discrete Exponential Families, with Fixed Execution Time and Quality Guarantees [Carter Butts]

October 18

Discussion of Goodreau et al. (Demography, 2009) [All]

October 25

Center in Formation Update

November 1

A Compressed PCA Subspace Method for Anomaly Detection in High Dimensional Data [Qi Ding]

November 15

A Propositional Network Assessment of Inglehardt's Postmaterialist Thesis [Lorien Jasny]

November 22

Racial Homophily, Spatial Networks, and Crime [John Hipp and Adam Boessen]

November 29

Sunbelt Abstract Roundup - Bring your abstract to present!

December 6

Latent Tree Models for Vertex Dynamics [Ragupathyraj Valluvan and Zack Almquist]

WINTER 2012

January 24

The Vertex Enumeration Problem [Sean Fitzhugh]

January 31

Interaction Dynamics on Twitter [Emma Spiro]

February 7

Detecting Triadic Structural Signatures [Katie Faust]

February 14

Discussion on Influence and Selection [John Hipp]

March 6

Sunbelt Previews

SPRING 2012

April 10

Relational Event Models of Gang Violence [George Tita and Carter Butts]

April 17

Diffusion of Twitter Adoption Among Government Agencies [Emma Spiro]

April 24

Italian Criminal Networks [Giulia Berlusconi]

May 1

Network Models for Language Acquisition [Nicole Beckage]

May 8

Center Updates and Discussion

May 15

Relational Topic Models [Jimmy Foulds]

May 22

Residual Analysis for Relational Event Models [Chris DuBois]

May 29

Discussion: Analyzing Network Data with Selection Bias

June 5

ASFP Regional Study: A First Look [Adam Boessen]

III. GRADUATE TRAINING

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

Louis Narens is the Director of the MBS graduate program. Others on the graduate committee who assist Professor Narens are Professors Marek Kaminski and Michael McBride. Working with the faculty of the Institute are 11 Ph.D. students, of whom 5 have 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:

Kalin Agrawal
Matthew Feldman
Robert Forbes
Giorgio Gosti
Lisa Guo
Dan Jessie
Tom McIntee
Ray Mendoza
Tolga Oztan
Heidi Tucholski
Sam Thorpe
Dan Wolf

. During the year, the Institute continued a program of recruiting graduate students via a mass e-mail describing our program to the Chairs and key faculty 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 summer the IMBS awarded summer research funds to 7 students.

B. Graduate Activities

This past year the IMBS graduate students organized student meetings with colloquia speakers. This gave students an opportunity to interact and network with professors. One of the goals is to gain some insight into how students perceive IMBS and how to facilitate more involvement of the social science student body.

Last summer we sent three students for extended stays at the Santa Fe Institute--2 MBS students and 1 LPS student. This year we sent 5 new students, all with very strong mathematics backgrounds.

Outreach

One of our Ph.D. students--Robert Forbes, under the direction of MBS faculty Louis Narens, has made presentations to groups of CEOs, CFOs, and members of Boards of Directors of major Orange County corporations about how to improve their forecastings through the amelioration psychological distortions. Forbes has found a way to incorporate mathematical modeling techniques developed by MBS faculty and other researchers--most notably ideas from Prospect Theory (for which the Psychologist Daniel Kahneman received the Nobel prize in economics)--into the standard forecasting software developed by Palisade's Corporation and used by all Fortune 500 companies. In addition Forbes has given similar presentations in Los Angeles County and is being featured in presentations later this summer, cosponsored by Palisades Corporation, in Silicon Valley in San Francisco.

The students also cooperated with other graduate students in putting on the 10th Annual Graduate Student Conference. The graduate organizers were, Kalin Agrawal, Ryan Kendall, and Heidi Tucholski. Following is the conference agenda:

The 10th Annual IMBS Graduate Student Conference
Wednesday, May 23, 2012

9:00 Welcome/ Coffee

Session I: Behavior in Experiments
Session Chair: Heidi Tucholski

9:10 **Ryan Kendall**, Economics
Strategic Behavior in an Open and Sequential Vote: An Experimental Test

9:40 **Daniel Jessie**, IMBS
Testing the Quantal Response Equilibrium (QRE)

10:10 **Michael Caldara**, Economics
Bidding Behavior in Pay-to-Bid Auctions: An Experimental Study

10:40 Ten Minute Break

Session II: Social Issues
Session Chair: Ryan Kendall

10:50 **Fan Jiang**, Economics
The Welfare Effect of Intermediation: A Theoretical Exploration of Markets with Wholesale Trade

11:20 **Bennett Holman**, LPS
Rethinking Evidence in Evidence-based Medicine

11:50 **Ray Mendoza**, IMBS
Syntax-based Collocation Extraction Methods and Cluster Separation of Verbs

12:20 Lunch Break

Session III: Problems with Aggregation

Session Chair: Ryan Kendall

1:20 **Heidi Tucholski**, IMBS
Military Retention Bonuses: Combating Information Asymmetry and Cheap Signals

1:50 **Matt Glass**, LPS
Impossibility in Judgment Aggregation: A Geometric Proof

2:20 **Lisa Guo**, IMBS/Statistics
Scientific Studies on Aesthetic Judgments

2:50 Ten Minute Break

Session IV: Group Behavior
Session Chair: Kalin Agrawal

3:00 **Justin Bruner**, LPS
Diversity, Tolerance and the Social Contract

3:30 **Andy Porter**, Economics
Dispersed Information: Experts and Investment Decisions

4:00 Ten Minute Break

4:10 **Giorgio Gosti**, IMBS
The Evolution of Naming Conventions

4:40 **Tomas McIntee**, IMBS
Methods of Estimating the Probability of Cyclic Pairwise Preferences

C. Undergraduate Training

Each year, the IMBS gives the "Jean-Claude Falmagne dissertation award" to a graduate student for the best dissertation that uses mathematics to develop conceptual advances for issues coming from the social and behavioral sciences. Going beyond the use of mathematics for computational purposes, the intent is to award a dissertation that uses concepts from mathematics to reach new conclusions. The prize is $1,000. Last year the award was given to Economics George Ng for his dissertation *"Essays in Behavior, Theories and Experiments"*. This year the award went to Logic and Philosophy graduate student Elliott Wagner dissertation, "*The Dynamics of Information Transfer"*.

IV. COMMUNICATION

A. Conferences

The IMBS held two conferences this academic year on "The Evolution of Religious and Social Norms", and "Mathematical Modeling of Infectious Diseases: Bridging Data and Models.

Below are this year's conference agendas:

"THE EVOLUTION OF RELIGIOUS AND SOCIAL NORMS"
January 27 & 28, 2012

FRIDAY, JANUARY 27

9:00 – 9:10 Comments by Donald Saari, Director of IMBS and Michael McBride, Department of Economics

9:10 – 10:00 LAURENCE IANNACCONE, Economics, Chapman University
"Lessons from Delphi: Religious Markets, Sacred Capitals, and Prophet Functions"?

10:00 – 10:10 Discussion

10:10 – 10:20 BREAK

10:20 – 11:10 JAMES MONTGOMERY, Sociology, Wisconsin
"Models of Intergenerational Transmission"

11:10 – 11:20 DISCUSSION

11:20 – 12:10 SIMON LEVIN, Ecology & Evolutionary Biology, Princeton
"Consensus and Collective-Decision Making"

12:10 –12:20 DISCUSSION

12:20 – 1:45 LUNCH BREAK

1:45 – 2:35 FRANCISCO AYALA, Ecology & Evolutionary Biology, UCI
"Whence Religion and Morality: An Evolutionist's View"

2:35 – 2:45 DISCISSION

2:45 – 3:00 BREAK

3:00 – 3:50 MICHAEL MACY, Sociology, Cornell
"Network Structure and the Diffusion of Religious and Normative Pathogens"

3:50 – 4:00 DISCUSSION

4:00 – 4:50 JEAN-PAUL CARVALHO, Economics, UCI
"Cultural Resistance: How Communities Respond to Globalization and Development"

4:50 – 5:00 DISCUSSION

SATURDAY, JANUARY 28

10:00 – 10:50 PETER RICHERSON, Environmental Science and Policy, UC Davis
"Cultural Group Selection and the Origin of Institutions and Norms"

10:50 – 11:00 DISCUSSION

11:00 – 11:50 HERB GINTIS, Economics, Santa Fe Institute
"Sticks and Stones: Lethal Weapons and the Evolution of Human Political Morality"

11:50 – 12:00 DISCUSSION

12:00 – 1:45 LUNCH BREAK

1:45 – 2:35 BRIAN SKYRMS, Logic & Philosophy of Science, UCI
"Naturalizing the Social Contract"

2:35 – 2:45 DISCUSSION

2:45 – 5:00 – SUMMARY AND GENERAL DISCUSSION –

CONFERENCE ON"MATHEMATICAL MODELING OF INFECTIOUS DISEASES: BRIDGING DATA AND MODELS"
October 28-29, 2011

FRIDAY, OCTOBER 28

9:00 – 9:10 Comments by Andrew Noymer, Dept. of Sociology and Director Saari

9:10 – 10:00 DAVID SHAY, Center for Disease Control
"How should we assess the annual health burden associated with influenza?"

10:00 – 10:10 Discussion

10:10 – 10:20 BREAK

10:20 – 11:10 ZHILAN FENG, Mathematics, Purdue
"Applications of epidemiological models to public health policymaking"

11:10 – 11:20 DISCUSSION

11:20 – 12:10 BRUCE CASWELL, Engineering, Brown
"Dissipative Particle Dynamics Simulation of Red Blood Cells and their Suspensions in Health and Disease"

12:10 –12:20 DISCUSSION

12:20 – 1:45 LUNCH BREAK

1:45 – 2:35 RAMANAN LAKSMINARAYAN, Center for Disease Dynamics, Economics and Policy
"Transboundary problems in infectious diseases"

2:35 – 2:45 DISCUSSION

2:45 – 3:00 BREAK

3:00 – 3:50 JUSTIN LESSLER, Center for Global Health, Johns Hopkins
"Model motivated data collection: The Fluscape Study"

3:50 – 4:00 DISCUSSION

4:00 – 4:50 MICHAEL DEEM, Bioengineering, Rice
"Immunce response to and evolution of influenza virus"

4:50 – 5:00 DISCUSSION

SATURDAY, OCTOBER 29

10:00 – 10:50 ANDREW NOYMER, Sociology, UCI
"Gompertz models of influenza mortality, USA 1959-2007"

10:50 – 11:00 DISCUSSION

11:00 – 11:50 JAMES HOLLAND JONES, Anthropology, Stanford
"Networks, Models of Social Interaction, and the Dynamics of Infectious Disease"

11:50 – 12:00 DISCUSSION

12:00 – 1:45 LUNCH BREAK

1:45 – 2:35 CARL SIMON, School of Public Policy, Univ. of Michigan
"Complex systems approach to modeling the spread of HIV"

2:35 – 2:45 DISCUSSION

2:45 – 5:00 SUMMARY AND GENERAL DISCUSSION -- "WHERE DO WE GO FROM HERE?"

B. Conferences/Seminars organized by IMBS Members

William Batchelder: Co-Organizer with Richard Checile and Xiangen Hu of one day Workshop entitled " Multinomial Processing Tree Modeling". Tufts University, July 2011.

Simon Huttegger: Organizer, “Strategic Interactions in Humans and other Animals", workshop organized at the KLI, Altenberg (Vienna), September 2-4, 2011

Robin Keller: I organized the Merage PhD Program Brown Bag lunch research seminar series and the annual Merage Ph.D. Research Fest in April 2012.

Louis Narens: I co-organized an international conference on Catastrophic Risks at Menlo Park this Spring. It was funded from a $60,000 grant to Columbia University that I co-wrote with Professor Graciela Chichlinsky of Columbia University. I presented papers at three conferences this year: The Menlo Conference, an AFOSR conference involving mathematical cognitive scientists in Washington D.C., and an international cognitive psychology conference held at Hood River, Oregon.

Lisa Pearl: Organizer of joint workshop on Input and Syntactic Acquisition & Psychocomputational Models of Human Language Acquisition, Linguistic Society of America, Portland, Oregon, January 2012
http://www.socsci.uci.edu/~lpearl/CoLaLab/isa2012/index.html

Organizer and faculty leader of the interdisciplinary discussion group “Computational Models of Language”: 2010-current http://www.socsci.uci.edu/~lpearl/colareadinggroup/

Michael McBride

Co-organizer, IMBS Conference on "Evolution of Religious and Social Norms" January 2012

Organizer, Experimental Social Science Laboratory Experimental Workshop, June 2012

Anthony McGann: Co-organizer with Donald Saari of discussion group on Voting Theory.

Andrew Noymer: Organizer of IMBS conference on “Mathematical modeling of infectious diseases: Bridging data and models”, October 2011.

Kenneth Small: Kuhmo-Nectar Annual Conferences. Member, Scientific Committee and President of organizing institution (International Transportation Economics Association) June 2012: Berlin

Simon Levin: Co-organizer/Participant, Dimensions of Biodiversity: Biological Controls on the Ocean C:N:P Ratios Meeting/Workshop, Princeton University, Princeton, NJ, May 24-25, 2012.

Co-Organizer/Participant: Role of Fire in Shaping Vegetation Pattern, EEB, Princeton University September 25, 2011.

C. Future Conferences

For next year, we have been planning the "Wisdom of the Crowd" conference in January that will involve economics, cognitive science, political science, sociology, statistics, and evolutionary biology. Among other conferences being considered include "Quantum Thinking" where symmetry structures developed in math and physics are being explored in cognitive sciences.

D. Visitors

The Institute hosted Princeton Professor Simon Levin, Moffett Professor of Biology, Princeton University during the academic year. His activities letter can be found in Appendix H.

Next year the Institute will again sponsor the visit of Professor Levin.

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/collooquia.html.

Following are the speakers and their presentations:

FALL 2011

October 6
Michael Lee
Dept. of Cognitive Sciences, UCI
"How cognitive modeling can benefit from hierarchical Bayesian models"

October 13
Joel Watson
Dept. of Economics, UCSD
"Contractual Chains"

October 20
Jean-Paul Carvalho
Department of Economics
"Veiling"

October 27
Jeffrey Krichmar
Dept. of Cognitive Science, UCI
"Reciprocity and Retaliation in Social Games with Adaptive Agents"

November 3
Duncan Luce

Department of Cognitive Sciences, UCI
"Subjective Intensity Is Appreciably More Complex Than Usually Acknowledged: Cross Modal Matching of Binary and Unary Intensity Attributes"

November 10
Jack Yellott
Dept. of Cognitive Sciences, UCI
"Prosthetic Typography: Correcting presbyopic defocus by deconvolving visual objects"

November 17
Stergios Skaperdas
Dept. of Economics, UCI
"Contests for Power"

WINTER 2012

January 12
Peyton Young
Dept. of Economics, Johns Hopkins and University of Oxford
"Fast Convergence in Evolutionary Equilibrium Selection"

January 19
Erol Akcay
Department of Ecology and Evolutionary biology, Princeton
"The evolution of reproductive skew under imperfect information"

February 2
Jukka-Pekka Onnela
Department of Biostatistics, Harvard School of Public Health, Harvard
"Exploring spreading processes in social networks and hospital-hospital transfer networks"

February16
Jean-Claude Falmagne
Dept. of Cognitive Science
"Real Life Assessments in Learning Spaces: With a reflection on the application of the methodology to an I.Q. test"

March 1
Joachim Vandekerckhove
Dept. of Cognitive Science, UCI
Hierarchal diffusion models for choice response times"

SPRING 2012

April 5
Dan Cavagnaro
Information Systems and Decision Sciences, CSUF
"Optimal Decision Stimuli for Risky Choice Experiments: an Adaptive Approach

April 12
Donald Hoffman
Department of Cognitive Sciences, UCI
"Vision in light of evolution"

April 19
Laura Fortunato
Santa Fe Institute
"The evolution of the human family"

April 26
David Wolpert
SFI and Los Alamos National Laboratory
"Unawareness, Information Theory, and Applying Game Theory in the Real World"

May 3
Kent Johnson
Department of Logic and Philosophy of Science, UCI
"Explicit Methods in Linguistic Theory Construction"

May 10
William H. Batchelder
Department of Cognitive Sciences, UCI
"Cultural Concensus Theory: Latest Developments"

MAY 17
Jim Andreoni
Department of Economics, UCSD
"Uncertainty Equivalents:Testing the Limits of the Independence Axiom"

A. Appropriations and Expenditures

V. BUDGET

Appropriations:

IMBS 2011-12 Budget allocation	$75,000.00
Merit Allocation	$ 760.00
IMBS 2010 Carry Forward	$19,666.43
Visitor Allocation	$19,429.30
Total budget for 2011-12	*$114,855.73*

Expenditures:

Salaries (Director, Staff, Visitor)	$49,623.00
School Administrative Support	$ 7,500.00
Conference/Colloquia	$17,316.72
Equipment	$ -0-
Supplies & Expenses	$ 2,428.44
Graduate Student Support	$13,500.00
Graduate Student Research	$ 5,000.00
Total Expenditures:	*$95,368.16*

Carry Forward: *$19,487.57*

2012-13 Encumbrances: ***($4,500 student support)***

B. Extramural Funding Activity

GRANTS AWARDED AND ACTIVE:

IMBS faculty research was supported by research grants totaling $23,996,149, with pending grants totaling $2,871,919. Following is a detailed breakdown of the extramural funding.

William H. Batchelder

Source of Support: Air Force Office of Scientific Research
Amount: $200,000
Award Period: 7/09 – 8/11
Title: "Statistical Development and Application of Cultural Consensus Theory"

Source of Support: AFOSR
Amount: $355,000
Award Period: 7/10 – 8/13
Title: "Statistical Development and Application of Cultural Consensus Theory Application of Cultural Consensus Theory, with X. Hu.

David Brownstone

Source: University of California Center for Energy and Environmental Economics
Amount: $17,000
Award Period: 10/11 – 6/12
Title: The Demand for Hybrid Vehicles.

Source: Brookings Institution
Amount: $30,000
Award Period: 10/11– 3/12
Title: Evaluation of California High Speed Rail Demand Projections.

Source: UC Sustainable Transportation (MRPI)
Amount: $55,000
Award Period: 1/12 – 12/12
Title: Potential Design, Implementation and Benefits of a Feebate Program for New Passenger Vehicles in California.

David Eppstein

Source: NSF
Award Amount: $400,000
Award Period: 9/08 -5/12
Title: Algorithms for Grants on Surfaces. With M. Goodrich (UCI) and R. Tamassia (Brown).

Source: Office of Naval Research: Multidisciplinary University Research Initiative
Award Amount: $529,152
Award Period: 7/10 – 8/15
Title: Scalable Methods for the Analysis of Network-Based Data, Co-Investigator.

Steve Frank

Source: NSF
Award Amount: $357,734
Award Period: 2009 – 2011
Title: Models of Natural Selection, Development, and Life History.

Bernard Grofman

Source: Sloan Foundation
Award Amount: $119,756
Award Period: 2011– 2012
Title: Monitoring the Nature and Impact of Public Input into the Legislative and Congressional Redistricting Process.

Simon Huttegger

Source: NSF
Award Amount: $275,000
ward Period: 7/10 – 6/13
Title: Collaborative Research: Dynamic Perspectives on Costs and Conflict in Signaling Interactions. Co-PIs: Kevin Zollman (Carnegie Mellon) and Carl Bergstrom (U.Washington).

Kimberly Jameson

Source: UC Pacific Rim Program
Award Amount: $46,616
Award Period: 7/11 – 6/13
Title: Faculty initiative grant: Investigating concept formation and the linguistic processing of natural categories across Pacific Rim ethnolinguistic groups.

Robin Keller

Source: USC CREATE Center, (subcontract from Department of Homeland Security fund
Award Amount: $19,982
Award Period: 3/11 – 9/11
Title: "The Effects of Time on Anticipated Consequences of Risks", Keller (PI), Yitong Wang (student investigator).

Natalia Komarova

Source: NIH
Award Amount: $1,211,630
Award Period: 8/11 – 715
Title: Virus Dynamics and Multiple Infection of Cells: Computational and Experimental Analysis', (with Dominik Wodarz, David Levy, PIs).

Source: NIH
Award Amount: 7/8 – 4/13
Award Period: $1,554,094
Title: Measuring Methylation Kinetics in Cancer Cells: Computations and Experiments

Michael Lee

Source: Applied Research Associates, Inc. (ARA) – subcontract from IARPA
Award Amount: $293,000
Award Period: 2011– 2012
Title: Aggregate Contingent Estimation (ACE) Program (subcontract S-001061

Source: Australian Research Council
Award Amount: $220,000
Award Period: 2011–2013
Title: Toward a unified account of adaptive decision making: learning to search, stop and decide, co-PI

Source: Air Force Office of Scientific Research
Award Amount: $222,000
Award Period: 2011–2013
Title: Sequential Sampling Models of Adaptive Human Decision-Making, PI

Simon Levin

Source of Support: National Science Foundation
Award Amount: $497,366
Award Period: 2011– 2015
Title: Dimensions: Collaborative Research: Biological Controls on the Ocean C:N:P Ratios. Role: Co-PI with Adam Martiny (University of California, Irvine)

Source of Support: National Science Foundation
Award Amount: $733,625
Award Period2011–2014
Title: The Evolution of Incentives and Social Structure under Imperfect Information. Role: PI (Postdoctoral researcher: Erol Akcay)

Source of Support: Soc. for Conservation Bio./David H. Smith Conservation Res. Fellowship Prog.
Award Amount: $92,084
Award Period: 2011– 2013
Title: Conservation in a Changing Climate: Predicting Range Shifts for Marine Spatial Planning. Role: PI (Postdoctoral researcher: Malin Pinsky)

Source of Support: Cooperative Institute for Climate Change (CISC) and NOAA
Award Amount: $146,907
Award Period: 2010 – 2012
Title: Cooperative Institute for Climate Science, Role: PI

Source of Support: Duke University/DARPA
Award Amount: $200,001
Award Period: 3/12 – 3/13
Title: Biochronicty: Time, Network, Evolution and Function, Role: PI with David Botstein (Princeton University) and Ned Wingreen (Princeton University)

Source of Support: Arizona State University/National Institutes of Health
Award Amount: $22,620
Award Period: 7/2012 – 6/2013; (Y2 funding expected in the near future)
Title: Modeling Anthropogenic Effects in the Spread of Infectious Diseases Role: Co-PI with Charles Perrings (Arizona State University)

Source of Support: Princeton University Grand Challenges
Award Amount: $343,000
Award Period: 2008 – 2012
Location of Project: Princeton University
Title: Common Property Problems in Health, Role: Co-PI with Ramanan Laxminarayan (Princeton University)

Source: The Andrew W. Mellon Foundation
Award Amount: $295,000
Award Period: 10/01/08 – 09/30/11
Title: Dynamics of South African Vegetation

Source: National Science Foundation
Award Amount: $497,366
Award Period: 1/11 – 12/15
Title: Dimensions: Collaborative Research: Biological Controls on the Ocean C:N:P Ratios

Source: National Science Foundation
Award Amount: $10,000
Award Period: 8//10 – 7/12

Title: NSF Postdoctoral Fellowship: Population Re-Distribution and Its Role in Fluctuating Local Bird Abundaces

Source of Support: National Science Foundation
Award Amount: $119,277
Award Period: 12/09 – 11/11
Title: Towards a Science of Sustainability

R. Duncan Luce

Source: Air Force Office of Scientific Research
Award Amount: $373,427
Award Period: 9/10 – 8/12
Title: Empirical and Theoretical Studies of Psychophysical Phenomena. (Co-PI R. Steingrimsson).

Michael McBride

Source: U.S. Air Force
Award Amount: $7,500,000
Award Period: 7/10 – 6/15
Title: Inferring Structure and Forecasting Dynamics on Evolving Networks. with PI Jeff Brantingham (UCLA), Andrea Bertozzi (UCLA), Ronald Breiger (University of Arizona), Yu-han Chang (USC), Paul Cohen (University of Arizona), Aram Galstyan (USC), Kristina Lerman (USC/ISI), Igor Mezic (UCSB), Brinton Milward (University of Arizona), Allon Percus (Claremont Graduate University), Alexander Tartakovsky (USC), George Tita (UC Irvine).

Source: U.S. Army Research Office
Award Amount: $3,750,000
Award Period: 2011– 2016
Title: Scalable, Stochastic and Spatiotemporal Game Theory for Real-World Human Adversarial Behavior, with PI Milind Tambe (USC), Andrea Bertozzi (UCLA), P. Jeffrey Brantingham (UCLA), Vincent Conitzer (Duke), Maria D'Orsogna (CSUN), Richard John (USC), Rajiv Maheswaran (USC), Yoav Shoham (Stanford), Martin Short (UCLA), Richard Dekmejian (USC)

Source: U.S. Army Research Office
Award Amount: $150,000
Award Period: 2011– 2012
Title: Instrumentation for the UC Irvine Experimental Social Science Laboratory, with Gary Richardson (UCI), Michelle Garfinkel (UCI), Stergios Skaperdas (UCI), Caesar Sereseres (UCI)

Source: Banque de France
Award Amount: $30,000
Award Period: 2011– 2013
Title: Liquidity and Information: An Experimental Study, co-PI with Aleksander Berentsen (University of Basel), Guillaume Rocheteau (UC Irvine)

Lisa Pearl

Source: NIAA (National Institute on Alcohol Abuse and Alcoholism
Award Amount: $3.1 million (UC Irvine amount $963,871).
Award Period: 2010 – 2015
Title: "Automating Behavioral Coding via Text-Mining and Speech Signal Processing." . Collaborative effort with University of Washington and University of Southern California**.** Co-PI.

Source: NSF
Award Amount: $176,713
Award Period: 2009 – 2013
Title: Testing the Universal Grammar Hypothesis. PI with Jon Sprouse.

Source: U.S. Navy
Award Amount: $39,590
Award Period: 2010 – 2011
Title: "Using Stylistic Topic Models to Detect Deception Through Unusual Linguistic Activity", with Mark Steyvers and Jeff Baumes. Role Co-PI.

Donald Saari

Source: NSF
Award Amount: $300,000
Award Period: 9/06 –9/11
Title: A Mathematical Foundation for Voting and Decision.

Source: NSF
Award Amount: $300,000
Award Period: 12/10 –11/12
Title: Analyzing multi-scale and multi-unit methodologies.

Padhraic Smyth

Source: Office of Naval Research
Award Amount: $3,359,000
Award Period: 6/08 – 5/13
Title: Scalable Methods for Analysis of Network-Based Data

Source: NIH 1R01AA018673-01A1
Award Amount: UC Irvine, $953,952
Award Period: 10/10 – 9/15
Title: Automated behavioral coding via text mining and speech signal processingSource of

Support: IARPA
Award Amount: $1,334,537
Award Period: 4/11– 2/14
Title: Statistical learning algorithms for text and network analysis

Ramesh Srinivasan

Source of Support: NIH
Award Amount: $2.36 million
Award Period: 9/09 – 5/13
Title: Dynamic Neuroimaging with High-resolution SSVEPs, PI.

Source of Support: Army Research Office
Award Amount: $4.1 million
Award Period: 8/09 – 7/13
Title: Silent spatialized communication among dispersed forces, Co-Principal Investigator (PI: D'Zmura M)

Hal Stern

Source: NSF
Award Amount: $626,000.
Award Period: 18/10 –7/13
Title: Enhanced EOF Representations and Time-Varying Statistical Models for Climate Patterns
(co-PIs: G. Magnusdottir, Y. Yu)

Source: NIH – NCRR
Award Amount: $750,000/yr.
Award Period: 7/10 – 6/15
Title: UC Irvine Institute for Clinical and Translational Science (Head of Biostatistics, Ethics and Research Design Unit; Dan Cooper (PI))

Douglas White

Source: Templeton Basic Science
Award Amount: $200,000
Award Period: 2012 –2014
Title: Cross-cultural adaptive dynamics for theories of evolution of moral gods and ethical principles

Source: NSF
Award Amount: $50,000
Award Period: 2013 –2016
Title Social Study Initiative

Jack Xin

Source: NSF
Award Amount:$419,691
Award Period: 6/12 – 5/14
Title: Reaction-Diffusion Front Speeds in Chaotic and Stochastic Flows .

Source: NSF
Award Amount: $1,950,568
Award Period: 9/09 – 8/14
Title: PRISM: UCI Interdisciplinary computational and applied mathematics program.

Source: NSF
Award Amount: $472,566
Award Period: 9/09– -8/12
Title: ADT: Sparse Blind Separation Algorithms of Spectral Mixtures and Applications.

PROPOSALS PENDING

David Eppstein

Source: NSF
Amount: $388,861
Award Period: 2012 – 2015
Title: Geometric Graph Algorithms

Simon Levin

Source of Support: Army Research Office
Award Amount: $120,323.00
Award Period: 8/11 – 8/13
Title: Coordination and Collective Decision Making (Y2 funding expected in the near future). Role: Co-PI with Iain D. Couzin (Princeton University) and Naomi E. Leonard (Princeton University)

Source of Support: National Science Foundation
Award Amount: $1,498,902.00
Award Period: 9/12 – 8/16

Title: CNH: Social-Ecological Complexity and Adaptation in Marine Systems. Role: PI (Postdoctoral researcher: James Watson)

Source of Support: U.S. Department of Homeland Security
Award Amount: $683,863.00
Award Period: 10/12 – 9/14
Title: Disease in Motion: Integrating Epidemic and Social Dynamics in the Control of Infectious Agents. Role: Co-PI with Bryan Grenfell (Princeton University)

Source of Support: The John Templeton Foundation
Award Amount: $179,970.00
Award Period: 10/12 – 9/14
Title: Evolution Construction and Complexity. Role: Co-PI with Corina Tarnita (Princeton University)

VI. APPENDICES

APPENDIX A
CURRENT FACULTY MEMBERS

MEMBERS

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). Associate Professor of Economics, University of California, Irvine. Research areas: Macroeconomics, economic theory.

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.

Jan Brueckner, (Ph.D. Stanford University). Professor of Economics, University of California, Irvine. Research areas: Urban economics, public economics, industrial organization, and housing finance.

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). Associate Professor of Sociology. Research areas: Computational and Mathematical Organization Theory, Games and Economic Behavior.

Jean-Paul Carvalho, (Ph.D. Oxford). UCI Assistant Professor of Economics. Research areas: Political economy, and game theory.

Yen-Sheng Chiang, (Ph.D. Sociology, University of Washington). Assistant Professor of Sociology. Research areas: Social Networks, Rational Choice Theory (Trust, Norms and Collective Action).

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.

David Eppstein, (Ph.D. Mathematics, Columbia University). Professor of Computer Science, University of California, Irvine. Research areas: Computational geometry and geometric optimization, Triangulation and mesh generation, Graph drawing and information visualization, Data depth and robust statistics, Analysis of exponential-time algorithms.

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.

Steve Frank, (Ph.D. Biology, University of Michigan). Professor of Ecology and Evolutionary Biology. Research areas: Complex phenotypes; quantitative dynamics of genetical, biochemical, and cellular mechanisms.

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.

Simon Huttegger, (Ph.D. Philosophy, University of Salzburg), Associate Professor of Logic and Philosophy of Science Science. Research areas; Probability Theory; Philosophy of Probability; Induction, Decision Theory, Social Philosophy, Dynamical Systems.

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.

Kent Johnson, (Ph.D. Philosophy, Rutgers University). Associate Professor of Philosophy, University of California, Irvine. Research areas: Philosophy of Linguistics, Philosophy of Psychology, Cognitive Science, Philosophy of Language, foundational issues concerning the scientific and psychological import of contemporary linguistic theory.

Marek Kaminski, (Ph.D. Government and Politics, University of Maryland). Associate Professor of Political Science, University of California, Irvine. Research areas: political consequences of electoral laws, voting models, democratization,

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), Professor, Department of Mathematics and Ecology & Evolutionary Biology. Research areas: Mathematical modeling and biology, virus dynamics, cancer modeling.

Igor Kopylov, (Ph.D. University of Rochester), Associate Professor of Economics. Research areas: Microeconomic theory, decision theory, and game theory.

Michael Lee, (Ph.D. Psychology, University of Adelaide), Professor of Cognitive Science, University of California, Irvine. Research areas: Mathematical and computational models of stimulus representation, categorization, memory, decision-making and problem-solving.

Simon A. Levin, (Ph.D. University of Maryland). Professor of Biology, Princeton University. Research areas: Modeling of ecological systems, dynamics of populations and communities, spatial heterogeneity and problem of scale, evolutionary, mathematical and theoretical ecology, evolution of cooperation and maintenance of social norms.

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). Associate Professor of Economics. Research areas: Microeconomics, game theory, and political economy.

Anthony McGann, (Ph.D. Political Science, Duke University). Associate 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.

Andrew Noymer, (Ph.D. University of California, Berkeley). Assistant Professor of Sociology, University of California, Irvine. Research areas: Population, Social Networks, Mathematical Models, Demography of Health & Mortality, Historical Demography

Richard Palais, (Ph.D. Harvard University). Adjunct Professor of Mathematics, University of California, Irvine. Research areas: soliton mathematics, compact differentiable transformation groups, nonlinear global analysis, critical point theory, submanifold geometry, integrable systems.

Lisa Pearl, (Ph.D. University of Maryland). Assistant Professor of Cognitive Sciences, University of California, Irvine. Research areas: Language acquisition, language change, natural language processing.

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 systems 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). Associate 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). Professor of Cognitive Sciences, University of California, Irvine. Research areas: Computational models of memory, reasoning and perceptions.

Rein Taagepera, (Ph.D.Physics, University of Delaware). Professor of Political Science, Department of Political Science, University of California, Irvine. Research areas: Quantitatively predictive models, electoral and party systems, Finno-Ugric area studies.

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.

Charles (Ted) Wright, (Ph.D. Experimental psychology, University of Michigan). 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). Professor of Mathematics, University of California, Irvine. Research areas: Applied and computational mathematics with applications in physics, engineering, imaging science and computer vision.

Kimberly Jameson, (Ph.D. Psychology, University of California, Irvine). Associate Project Scientist, University of California, Irvine. Research areas: categorization behaviors; modeling concept formation for perceptual stimuli (e.g., the cognitive organization of color sensations and its relationship to linguistic classifiers); the development and breakdown of these cognitive functions; and optimum performance in tasks involving color codings.

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.

APPENDIX B
SCIENTIFIC PUBLICATIONS OF MEMBERS, ACADEMIC 2011-12[1]

William Batchelder

Agrawal, K., and Batchelder, W.H. (2012). Cultural consensus theory: Aggregating signed graphs under a balance constraint. In S.J. Yang, A. M. Greenberg, and M. Endsley (Eds.). Social Computing, Behavioral-Cultural Modeling and Prediction, LNCS 7227, pp.53-60. New York: Springer Verlag.

Batchelder, W.H., Hu, X., and Riefer, D.M. Multinomial Modeling. In H. Pashler (Ed.). The Encyclopedia of the Mind. Sage Publications (In Press).

Batchelder, W. H. Discrete state models of information processing. In J. D. Wright (Ed.) Encyclopedia of the Social and Behavioral Sciences, Second Edition. (In Press).

Batchelder, W. H., and Alexander, G. E. Insight problem solving: A critical examination of the possibility of formal theory. Journal of Problem Solving (Accepted).

Batchelder, W.H., and Anders, R. (2012). Cultural consensus theory: Comparing different concepts of cultural truth. Journal of Mathematical Psychology (In Press).

Oravecz, Z., Vandekerckhove, J., and Batchelder, W. H. Bayesian Cultural Consensus Theory. Field Methods, (Accepted).

John P. Boyd

Measuring centrality and power recursively in world city networks. (with Matthew Mahutga and David Smith). *Urban Studies,* accepted.

William Branch

Monetary Policy and Heterogeneous Expectations, (with George W. Evans) *Economic Theory, May 2011*.

Business Cycle Amplification with Heterogeneous Expectations, (with Bruce McGough) *Economic Theory*, May 2011.

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

Learning about Risk and Return: A Simple Model of Bubbles and Crashes, (with George W. Evans) *American Economic Journal: Macroeconomics*, forthcoming.

Finite Horizon Learning, (with George W. Evans and Bruce McGough) *Essays in Honor of Seppo Honkapohja*, forthcoming.

Jan Brueckner

Lectures on Urban Economics, MIT Press, 2011.

Alliances, Codesharing, Antitrust Immunity and International Airfares: Do Previous Patterns Persist? (with Darin Lee and Ethan Singer), *Journal of Competition Law and Economics,* 7, 573-602 (September 2011).

Subprime Mortgages and the Housing Bubble (with Paul Calem and Leonard Nakamura), Journal of *Urban Economics* 71, 230-243 (March 2012).

Price and Frequency Competition in Freight Transportation (with Nilopa Shah, first author), *Transportation Research Part A* 46, 938-953 (July 2012).

Jean-Paul Carvalho

Veiling, forthcoming *The Quarterly Journal of Economics.*

David Eppstein

M. J. Bannister and D. Eppstein. (2011). Hardness of approximate compaction for nonplanar orthogonal graph drawings. In M. J. van Kreveld and B. Speckmann, editors, Proc. 19th Int. Symp. Graph Drawing, volume 7034 of Lecture Notes in Computer Science, pages 367–378. Springer-Verlag.

M. J. Bannister and D. Eppstein. (2012). Randomized speedup of the Bellman–Ford algorithm. In Proc. Analytic Algorithmics and Combinatorics (ANALCO12), pages 41–47.

G. Barequet, M. T. Dickerson, D. Eppstein, D. Hodorkovsky, and K. Vyatkina. (2011). On 2-site Voronoi diagrams under geometric distance functions. In Proc. 8th International Symposium on Voronoi Diagrams in Science and Engineering (ISVD 2011.

K. Buchin, D. Eppstein, M. Löffler, and R. I. Silveira. (2011). Adjacency-preserving spatial treemaps. In Proc. Algorithms and Data Structures Symposium (WADS 2011.

E. Chambers, D. Eppstein, M. T. Goodrich, and M. Löffler. (2012). Drawing graphs in the plane with a prescribed outer face and polynomial area. J. Graph Algorithms & Applications, 16(2):243–259.

C. Duncan, D. Eppstein, M. Goodrich, S. Kobourov, and M. Löffler. (2012). Planar and poly-

arc Lombardi drawings. In M. van Kreveld and B. Speckmann, editors, Graph Drawing, volume 7034 of LNCS, pages 308–319. Springer.

C. A. Duncan, D. Eppstein, M. T. Goodrich, S. G. Kobourov, and M. Nöllenburg. (2012). Lombardi drawings of graphs. J. Graph Algorithms & Applications, 16(1):85–108.

D. Eppstein. (2011). Optimally fast incremental Manhattan plane embedding and planar tight span construction. Journal of Computational Geometry, 2(1):144–182.

D. Eppstein. (2012). Solving single-digit Sudoku subproblems. In Proc. 6th International Conference on Fun with Algorithms (FUN 2012), volume 7288 of Lecture Notes in Computer Science, pages 142–153. Springer-Verlag.

D. Eppstein, M. Goodrich, and M. Löffler. (2011). Tracking moving objects with few handovers. In F. Dehne, J. Iacono, and J.-R. Sack, editors, Symp. Algorithms and Data Structures, volume 6844 of LNCS, pages 362–373. Springer.

D. Eppstein and M. T. Goodrich. (2011). Succinct greedy geometric routing using hyperbolic geometry. IEEE Trans. Computers, 60(11):1571–1580.

D. Eppstein, M. T. Goodrich, M. Löffler, D. Strash, and L. Trott. (2011). Category-based routing in social networks: membership dimension and the small-world phenomenon. In Proc. 3rd Int. Conf. Computational Aspects of Social Networks (CASon 2011).

D. Eppstein, M. T. Goodrich, F. Uyeda, and G. Varghese. (2011). What's the difference? Efficient set reconciliation without prior context. In Proc. ACM SIGCOMM 2011.

D. Eppstein, E. Mumford, B. Speckmann, and K. Verbeek. (2012). Area-universal and constrained rectangular layouts. SIAM J. Computing, 41(3):537–564.

D. Eppstein and J. Simons. (2011). Confluent Hasse diagrams. In M. J. van Kreveld and B. Speckmann, editors, Proc. 19th Int. Symp. Graph Drawing, volume 7034 of Lecture Notes in Computer Science, pages 2–13. Springer-Verlag.

D. Eppstein and K. A. Wortman. (2011). Optimal angular resolution for face-symmetric drawings. J. Graph Algorithms & Applications, 15(4):551–564.

Jean-Claude Falmagne

Knowledge Spaces: Applications in Education. Eds. D. Albert, C. Doble, D. Eppstein, J.-Cl. Falmagne, and X. Hu. To be published in the Interdisciplinary Applied Mathematics Series, Springer-Verlag. Expected date of publication: 2013.

Overview. J.-Cl. Falmagne and C.W. Doble. A chapter in *Knowledge Spaces: Applications in Education.* Eds. D. Albert et al.

E. Cosyn, C.W. Doble, J.-Cl. Falmagne, A. Lenoble, N. Thiery, and H. Uzun. *Assessing mathematical knowledge in a learning space.* A chapter in *Knowledge Spaces: Applications in Education.* Eds. D. Albert et al.

J.-Cl. Falmagne, J.-P. Doignon, and E. Cosyn. *Mathematical Compendium.* A chapter in *Knowledge Spaces: Applications in Education.* Eds. D. Albert et al.

J.-Cl. Falmagne. *Projections and symmetric expansions of a learning space.* arXiv:0803.0575v1 [math-CO]. To be published in a volume honoring George Sperling.

J.-Cl. Falmagne. *Markovian Processes in Knowledge Spaces*, An article in the *International Encyclopedia of Social and Behavioral Sciences*. *2nd Edition.*

Katherine Faust

Rindfuss, Ronald R., Martin Piotrowski, Barbara Entwisle, Katherine Faust and Jeffery Edmeades. (2012). Migrant remittances and the web of family obligations: Ongoing support among spatially extended kin. *Population Studies*, 66: 87-104

Adams, Jimi, Katherine Faust, and Gina S. Lovasi. (2012). Capturing context: Integrating spatial and social network analyses. *Social Networks* 34:1-5.

Verdery, Ashton M. Barbara Entwisle, Katherine Faust, Ronald R. Rindfuss. (2012). Social and spatial networks: Kinship distance and dwelling unit proximity in rural Thailand. *Social Networks*: 112-127. doi:10.1016/j.socnet.2011.04.003

Steve Frank

Frank, S. A. (2011). Natural selection. I. Variable environments and uncertain returns on investment. Journal of Evolutionary Biology 24:2299-2309.

Frank, S. A. (2011). Natural selection. II. Developmental variability and evolutionary rate. Journal of Evolutionary Biology 24:2310-2320.

Frank, S. A. (2012). Natural selection. III. Selection versus transmission and the levels of selection. Journal of Evolutionary Biology 25:227-243.

Frank, S. A. (2012). Natural selection. IV. The Price equation. Journal of Evolutionary Biology 25:1002-1019.

Frank, S. A. and Rosner, M. R. (2012). Nonheritable cellular variability accelerates the evolutionary processes of cancer. PLoS Biology 10:e1001296.

Frank, S. A. (2012). Wright's adaptive landscape versus Fisher's fundamental theorem. Pages 00-00 in The Adaptive Landscape in Evolutionary Biology. E. Svensson and R. Calsbeek, eds. Oxford University Press.)

Michelle Garfinkel

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Stern, H. (2012). Discussion of "Quantifying the Weight of Evidence from a Forensic Fingerprint Comparison: A New Paradigm" by C. Neumann, I. W. Evett, and J. Skerrett, *Journal of the Royal Statistical Society A,* Vol. 175, Part 2, pp. 408-409.

Rein Taagepera

R.Taagepera (2011). Adding Meaning to Regression. *European Political Science*, 10 (1), 73-85.

R. Taagepera (2011). Albert, Martin, and Peter Too: Their Roles in Creating the Estonian and Latvian Nations. *Journal of Baltic Studies,* 44(2), 125-141.

R. Taagepera and Matt Qvortrup (2011). Who Gets What, When, How -- Through Which Electoral System? *European Political Science*, forthcoming.

R. Taagepera, 2012. Baltic quest for a Hungarian path, 1965. *Journal of Baltic Studies*, forthcoming.

Douglas White

Douglas R. White, Malcolm M. Dow, E. Anthon Eff, Editors. 2013 (contracted). **Companion to Cross-Cultural Research**, Blackwell Publishers.

Douglas R. White. (2012a). Networks and Globalization Policies, Networks in Social Policy Problems. Editors, Balázs Vedres, and Marco Scotti. Cambridge UK: Cambridge University Press, in press..

Douglas R. White. (2012c). The reticular approach to kinship. Douglas R. White and Michael Houseman. Penser la Parenté: Méthodes, modèles, debates, Cahier de l'Homme, Chapter 5: Editors, Klaus Hamberger, François Hèran, and Michael Houseman, in press.

Douglas R. White, Ren Feng, Giorgio Gosti, B. Tolga Oztan. 2011. Easy R scripts for Two-Stage Least Squares, Instruments, Inferential Statistics and Latent Variables. For submission to Sociological Methodology 2013.
http://intersci.ss.uci.edu/wiki/pdf/MoralDraft9newformatShortA10_25_11.pdf

Douglas R. White, Tolga Oztan, Giorgio Gosti, Elliott Wagner, and John Snarey. 2011. Discovery of Hidden Variables for the Evolution of Ethical Religions Shortened draft for submission to PNAS. http://intersci.ss.uci.edu/wiki/pdf/2sLS-isReOrg10a.pdf

Douglas R. White. 2011a. Kinship, Class, and Community, **Sage Handbook of Social Networks**. Chapter 10, pp. 129-147: Editors, John C. Scott and Peter Carrington.

Douglas R. White, Klaus Hamberger and Michael Houseman. (2011b). Kinship Network Analysis, **Sage Handbook of Social Networks**. Chapter 10, pp. 533-546. Editors, John C. Scott and Peter Carrington. Sage.

Douglas R. White. (2011c). Social Networks, Cognition and Culture. **Companion to Cognitive Anthropology**, Chapter 18, pp. 331-354, Editors, David Kronenfeld, Giovanni Bennardo, Victor De Munch, and Michael Fischer. Blackwell Publishers.

Jack Xin

A Convex Model for Non-negative Matrix Factorization and Dimensionality Reduction on Physical Space (with E. Esser, M. Moller, S. Osher, G. Sapiro), to appear in IEEE Transactions on Image Processing 2012.

3.Multi-Channel L1 Regularized Convex Speech Enhancement Model and Fast Computation by the Split Bregman Method (with M. Yu, W. Ma, S. Osher), IEEE Transactions on Audio, Speech and Language Processing, 20(2), pp 661-675, 2012. DOI:10.1109/TASL.2011.2164526.

4A Recursive Sparse Blind Source Separation Method and its Application to Correlated Data in NMR Spectroscopy of Biofluids (with Y. Sun), Journal of Scientific Computing, to appear, DOI:10.1007/s10915-011-9528-9.

A Convex Model and L1 Minimization for Musical Noise Reduction in Blind Source Separation (with W. Ma, M. Yu, S. Osher), Comm Math Sciences, 10(1), pp 223-238, 2012.

Under-determined Sparse Blind Source Separation of Nonnegative and Partially Overlapped Data (with Y. Sun), SIAM J. Scientific Computing, Vol. 33, No. 4, pp 2063-2094, 2011.

Content Adaptive Image Matching by Color-Entropy Segmentation and Inpainting (with Y. Sun), the 14th International Conference on Computer Analysis of Images and Patterns, Pedro Real et al (Eds.), CAIP 2011, LNCS 6855, pp. 471-478, 2011, Springer-Verlag.

A Recursive Sparse Blind Source Separation Method for Nonnegative and Correlated Data in NMR Spectroscopy (with Y. Sun), the 14th International Conference on Computer Analysis of Images and Patterns, Pedro Real et al (Eds.), CAIP 2011, LNCS 6855, pp. 81-88, 2011, Springer-Verlag.

Postprocessing and Sparse Blind Source Separation of Positive and Partially Overlapped Data (with Y. Sun, C. Ridge, F. del Rio, A.J. Shaka), Signal Processing 91(8)(2011), pp 1838-1851.

R. Ritch, M. Yu, J. Xin. A Triple-Microphone Real-Time Speech Enhancement Algorithm Based on Approximate Array Analytical Solutions, to appear in Proceedings of Interspeech 2012.

Asymptotics for turbulent flame speeds of the viscous G-equation enhanced by cellular and shear flows (with Y. Liu, Y. Yu), Arch. Rationa lMech. Analysis, 199(2), pp 527-561 (2011).

Jack Yellott

Watson, A.B., & Yellott, J.I., Jr. A unified formula for light-adapted pupil size. Currently under review at the Journal of Vision.

APPENDIX C
IMBS TECHNICAL REPORTS, 2011-12

MBS 10-06
Emergence of a Signaling Network with "Probe and Adjust"
Simon M. Huttegger and Brian Skyrms

MBS 10-07
Bernoulli Graph Bounds for General Random Graphs
Carter T.Butts

MBS 10-08
A New Way to Analyze Paired Comparisons
Donald G. Saari

MBS 11-01
Bisymmetry Properties of Luce's (2004) Global Psychophysical Representation
R. Duncan Luce

MBS 11-02
Theory and Tests of the Conjoint Commutativity Axiom for Additive Conjoint Measurement
Duncan Luce, Ragnar Steingrimsson

MBS 11-03
Logistic Network Regression for Scalable Analysis of Networks with Joint Edge/Vertex Dynamics
Zack W. Almquist, Carter T. Butts

MBS 11-04
Learning to Signal with Two Kinds of Trial and Error
Brian Skyrms

APPENDIX D
COLLOQUIA AND CONFERENCES OF IMBS MEMBERS, 2011-12[2]

William Batchelder

"Cultural Consensus Theory: Comparing different concepts of cultural truth". Batchelder, W. H., and Anders, R.. Paper presented at Annual Meeting of the Society for Mathematical Psychology. Tufts University, July 2011.

Negan, J. (Presenter), and Batchelder, W.H. A Thurstonian Model with order effects and ties. Paper presented at Annual Meeting of the Society for Mathematical Psychology. Tufts University, July 2011.

Gosti, G. (Presenter), and Batchelder, W.H. The Naming Game on a Directed Graph. Paper presented at Annual Meeting of the Society for Mathematical Psychology. Tufts University, July 2011.

Agrawal, K. (Presenter), and Batchelder, W.H. Cultural Consensus Theory: Estimating Consensus Graphs under constraints. Paper presented at Annual Meeting of the Society for Mathematical Psychology. Tufts University, July 2011.

Batchelder, W.H. Specification of Multinomial Processing Tree Models. Presentation at the Workshop on Multinomial Processing Tree Models. Tufts University, July 2011.

Batchelder, W.H. Statistical inference for Multinomial Processing Tree Models. Presentation at the Workshop on Multinomial Processing Tree Models. Tufts University, July 2011.

Batchelder, W.H. Some Issues in the Developing a Theory of Human Problem Representation. Keynote address at Dagstahl Workshop: Computer Science and Problem Solving. Dagstahl, Germany, September 2011.

Batchelder, W.H. Cultural Consensus Theory: Detecting Experts and Their Shared Knowledge. Invited Paper presented at DIMACS Workshop on the Science of Expert Opinion. Rutgers University, October 2011.

Batchelder, W. H., and Alexander, G. Doubling Down on the Double High Threshold Model. Invited Paper read at Annual Ward Edwards Bayesian Conference. California State University at Fullerton, January 2012.

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

Batchelder, W. H., and Agrawal, K. Cultural Consensus Theory: Aggregating Complete Signed Graphs Under a Balance Constraint -- Part 1. International Sunbelt Social Network Conference XXXII, Redondo Beach, California, March 2012.

Agrawal, K. (Presenter), and Batchelder, W. H. Cultural Consensus Theory: Aggregating Complete Signed Graphs Under a Balance Constraint -- Part 2. International Sunbelt Social Network Conference XXXII, Redondo Beach, California, March 2012.

Agrawal, K.(Presenter), and Batchelder, W. H. Cultural Consensus Theory: Aggregating Signed Graphs Under a Balance Constraint. Paper presented at the Annual Meeting of the Social Computing, Behavioral Cultural Modeling, and Prediction. University of Maryland, April 2012.

Batchelder, W. H. Cultural Consensus Theory: Latest Developments. Colloquium Institute for Mathematical Behavioral Sciences, University of California Irvine, May 2012.

William Branch

Workshop on Diverse Beliefs, Department of Economics, Stanford University, August 2010.

Conference on Survey Data on Expectations, New York Federal Reserve Bank, November 2010.

Department of Economics, U.C. Irvine, April 2011.

Conference on Computational Economics and Finance, San Francisco, June 2011.

David Brownstone

"Demand for high fuel-economy vehicles." Transportation Economics meeting, Transportation Research Board, Beckman Center, Irvine, June 2012.

"Demand for high fuel-economy vehicles." UCE3 annual conference, University of California Energy and Environment Institute, Berkeley, CA, June 2012.

"The future of transportation demand modeling." SHRP conference, Transportation Research Board, National Academy of Sciences, Washington, DC. Panelist, May 2012.

"Demand for high fuel-economy vehicles." Seminar, University of California, Davis Institute of Transportation Studies, Panel: Sustainable Transportation Center Distinguished Speaker, U.C. Davis, January 2012.

"Demand for high fuel-economy vehicles." Seminar, University of California, Berkeley Institute of Transportation Studies, University of California, Berkeley, September 2012.

Jan Brueckner

Norwegian University of Science and Technology, September 2011.
Uppsala University, Sweden, September 2011.
Kuhmo-Nectar Conference on Transportation Economics, Stockholm, July 2011.
Asian Development Bank Workshop on Urbanization in Asia, Honolulu, December 2011.
Regional Science Association International Meetings, Miami, November 2011.
Kuhmo-Nectar Conference on Transportation Economics, Berlin, June 2012.
Conference on the "Economics of the Airline Industry," Brookings Institution, May 2012.
Southern California Conference on Applied Microeconomics, Claremont-McKenna College, April 2012.
University of Illinois at Urbana-Champaign, March 2012.
Federal Reserve Bank of Philadelphia, March 2012
American Real Estate and Urban Economics Association Meetings, Chicago, January 2012.

Jean-Paul Carvalho

Referee for *Quarterly Journal of Economics*, *American Political Science Review*, *Economic Journal*, *Games and Economic Behavior*.

AALIMS Islam and Muslim Societies Annual Conference, Stanford University, April 2012.

Public Choice Seminar, George Mason University, April 2012.

ASREC Annual Conference, Chapman University March 2012.

Evolution of Religion and Social Norms Conference, IMBS, UC Irvine, January 2012.

IRES Seminar, Chapman University, December 2011.

Comparative Politics Workshop, Stanford University, October 2011.

David Eppstein

Hardness of approximate compaction for nonplanar orthogonal graph drawings. Symposium on Graph Drawing, Eindhoven, the Netherlands, September 2011.

Jean-Claude Falmagne

Deriving scientific or geometric laws from thought experiments, via meaningfulness, with an application to the Pythagorean Theorem, Invited talk at the symposium honoring Patrick Suppes 90th birthday. Stanford University, March 10, 2012

Learning Spaces in Real Life, invited address, 40th EMPG meeting, Paris, August 28-31, 2012.

Learning spaces in real life, with a reflection on the application of the methodology to an I.Q. test. IMBS colloquium series, February 16, 2012.

Katherine Faust

"Comparing Local Structure in Social Networks", 7th IASC-ARS Σ Joint 2011 Taipei Symposium, Taipei, Taiwan, December 2011.

"Animal Social Networks", Institute of Statistical Science, Academia Sinica, Taipei, Taiwan, December 2011.

"Triads in Social Networks", Department of Sociology, National Chengchi University, Taipei, Taiwan, December 2011.

"Comparing Social Networks", Keynote Address. 7th UK Conference on Social Networks, Greenwich England, July 2011.

"Comparing Local Configurations in Social Networks," International Sunbelt Social Network Conference. St. Pete Beach, Florida. February 2011.

"Sociality and Associations: A cross disciplinary look at mode definition in affiliation networks", International Sunbelt Social Network Conference. Riva del Garda, Italy, July 2011.

Simon Huttegger

"Invariance and Meaningfulness", Keynote Address at the Workshop on Measure Theoretic Issues in Biology, The Research Institute at Nationwide Children's Hospital in Columbus, Ohio, June 2012.

"Probe and Adjust", First CSLI Workshop on Logic, Rationality, and Intelligent Interaction, Stanford University, June 2012.

"Meaning and Information in Signaling Games with Conflicting Interests" Workshop at CUNY on Signaling and Meaning, New York, March 2012.

"Concerns and Alternatives to Costly Signaling in Biology", KLIWorkshop on Strategic Interactions in Humans and other Animals, Altenberg (Vienna), September 2011.

"Methodology in Biological Game Theory", Pacific APA meeting, April 2012.

Kimberly Jameson

Jameson, K. A. & Komarova, N. L. A quantitative theory of human color choices. Presentation at the Annual Cognitive Sciences Association for Interdisciplinary Learning (CSAIL). Hood River Valley, Oregon. July 2012.

Marek Kaminski

"Initiation Games," Claremont Graduate School, May 2011.

Robin Keller

"Counteracting the Uncertainty Effect Bias." Tianjun Feng (presenter) with Yitong Wang and L. Robin Keller, INFORMS Beijing, June 2012.

"Shifting Perception of Risks Experienced at Different Times". L. Robin Keller (poster presenter), Yitong Wang, & Tianjun Feng. Behavioral Decision Research in Management (BDRM) Conference, Boulder, CO, June 2012.

"Likelihood estimates across probability levels with and without pictographs." Leonhardt, J. (poster presenter), Keller, L. R, Barone, D., & Pechmann, C. Merage PhD Research-Fest. University of California, Irvine. Irvine, CA, April 2012.

"Pictographs and probabilities." Leonhardt, J. (presenter), Keller, R., & Pechmann, C. Judgment and Decision Making Preconference. Society for Personality and Social Psychology. San Diego, CA. Peer Reviewed Conference Presentation (Poster), 2012..

"Time Inconsistency of Risk Perception". Tianjun Feng, L. Robin Keller (presenter) & Yitong Wang, Society for Risk Analysis, Charleston, SC, December 2011.

"Using risk graphics across probability levels." Leonhardt, J. (presenter), Keller, R., Beals, R., & Pechmann, C. Society for Judgment and Decision Making. Seattle, WA, 2012.

Leonhardt, J. (presenter), Keller, L. R., & Pechmann, C. "Does uncertainty act as a causal buffer?" Summer Institute on Bounded Rationality. The Center for Adaptive Behavior and Cognition. Max Planck Institute. Berlin, Germany, 2011. Peer Reviewed Conference Presentation (Oral).

Invited presentations in session chaired by L. Robin Keller and Tianjun Feng, INFORMS conference, Nov. 2011, Charlotte, NC:

"Time Inconsistency of Risk Perception". Tianjun Feng, L. Robin Keller (presenter), Yitong Wang.

Tianjun Feng (presenter), L. Robin Keller, Yitong Wang, "Counteracting the Uncertainty Effect Bias."

Natalia Komarova

International conference on stochastic processes in systems biology, genetics and evolution, Houston, Texas, August 2012.

107th Statistical Mechanics Conference, Rutgers, New Jersey, May 2012.

Workshop on Mathematical Oncology IV: Integrative Cancer Biology, Fields Institute, Toronto, Canada, March 2012.

Modeling Social Complexity, NIMBioS-NESCent Investigative Workshop, Knoxville, Tennessee, February 2012.

Mathematical Methods in Systems Biology and Population Dynamics, AIMS, Muizenberg, South Africa, January 2012.

Michael Lee

"How Cognitive Modeling Can Benefit From Hierarchical Bayesian Models", Invited presentation, Purdue University, March 2012

"Combining Human Knowledge", Invited presentation, Air Force Research Laboratory, Chief Scientist series, Dayton OH, February 2012

"Limited Search and Environmental Regularities", Australasian Mathematical Psychology Meeting, Adelaide, February 2012

"How Cognitive Modeling Can Benefit From Hierarchical Bayesian Models", Invited presentation, University of New South Wales, February 2012

"Two Misuses of Probability Theory in Cognitive Modeling", Annual Interdiscplinary Conference, Breckenridge CO, January 2012

"How Cognitive Modeling Can Benefit From Hierarchical Bayesian Models", Invited presentation, Center For Economic Analysis of Risk, Georgia State University, October 2011

"Using Hierarchical Bayesian Methods to Extend Heuristic Models of Decision-Making", Invited presentation, Department of Psychology, University of Basel, 2011.

"Modeling multi-trial free recall when rehearsal is covert", Context in Episodic Memory Symposium, Invited Talk, Philadelphia, 2011.

"A model-based approach to measuring expertise in ranking tasks", 33rd Annual Conference of the Cognitive Science Society, Boston, 2011.

"A self-regulating accumulator model of cue search", 44th Annual Meeting of Society for Mathematical Psychology, Boston, 2011.

Simon Levin

"Consensus and collective-decision making," Evolution of Religious and Social Norms Conference, Institute for Mathematical Behavioral Sciences, University of California, Irvine (IMBS), January 27, 2012.

"The Emerging Challenge of Sustainability," Emergent Issues in Ecology Lecture Series, NEAT ORU and Peter A. Rock Thermochemistry Laboratory, The University of California, Davis, February 2, 2012.

"Sustainability," High Table Dinner, Graduate College, Princeton University, February 22, 2012.

"Mathematical and Computational Challenges in the Study of Complex Adaptive Systems," The Social Biology of Microbial Communities, Institute of Medicine of the National Academies, Forum on Microbial Threats, Washington, D.C., March 6-7, 2012.

"Critical Transitions in Ecosystems and Complex Adaptive Systems," Workshop on Critical Transitions in Complex Systems, Imperial College, London, March 21, 2012.

"Ecological and Evolutionary Perspectives on Sustainability," Boston Consulting Group, New York, NY, April 13, 2012.

"Collective Motion and Collective Decision-Making," Spatial Models of Micro and Macro Systems Workshop, Mathematical Biosciences Institute, The Ohio State University, Columbus Ohio, April 19, 2012.

"Evolutionary Perspectives on Animal Behavior," NSF/ARL Locomotion Systems Science Meeting/Workshop, Arlington, VA, May 29, 2012.

"Collective Motion, Collective Decision-Making and Consensus Formation," BIOCOMP 2012: Mathematical Modeling and Computational Topics in Biosciences (dedicated to Professor Luigi M. Ricciardi), Vietri sul Mare, Italy, June 4, 2012; Chair, Plenary Session, June 7.

"Collective Motion in Animal Populations"; "How to Develop Interdisciplinary Research Collaborations," Mathematical Biology Workshop and IGTC Summit, University of Victoria, Victoria, British Columbia, Canada, July 14-16, 2011.

"The Challenge of Sustainability," Lansdowne Lecturer, School of Environmental Studies, University of Victoria, Victoria, British Columbia, Canada, July 18, 2011.

Invited Speaker: "Evolutionary Perspectives on Public Goods and Collective Behavior," Mathematical Models in Ecology and Evolution Conference, University of Groningen, The Netherlands, August 17-19, 2011.

"Evolution of Ecosystem Properties," Honorary Lecture, Math and Theoretical Ecology (MATE) 2011, University of Essex, England, August 20, 2011.

"Crossing Scales," The John Innes Haldane Lecture, John Innes Centre, Norwich BioScience Institutes, Norwich, UK, October 28, 2011.

"Complex Adaptive Systems and the Challenge of Sustainability," The David Bradford Seminars in Science, Technology, and Environmental Policy, The Program in Science, Technology and Environmental Policy (STEP), Princeton University, November 14, 2011.

Keynote Speaker, "Complex Adaptive Systems and the Challenge of Sustainability," Kyushu University Centenary Symposium, November 19, 2011.

"Evolution of Ecosystem Properties," Mathematical Ecology Workshop, Kyushu University, November 20, 2011.

"Complex Adaptive Systems and the Challenge of Sustainability•," Roland Lamberson Lecture in Ecology. Humboldt University, CA; "Collective Motion and Collective Decision-Making", Humboldt University (second, afternoon lecture), December 8, 2011.

R. Duncan Luce

Society Mathematical Psychology, July 15-18, 2011, Tuffs University "Subjective intensity representations, bisymmetry, commutativity, and associativity.

European Mathematic Psychology Group, Aug. 29-31, 2011, Telcom Paris Tech, Paris, France "Cross-modal matching for binary and unary intensities.

Institute for Mathematical Behavior Sciences Colloquium Nov 3, 2011 "Subjective intensity is appreciably more complex than is usually acknowledged: Cross-Modal matching of binary and unary attributes.

AFOSR Presentation, Arlington, VA, January 23-27, Empirical and theoretical studies of psychophysical phenomena.

Michael McBride

"Conflict, Settlement, and the Shadow of the Future", Max Planck Institute for Tax Law and Public Economics Workshop, July 2011, Munich, Germany.

"The Enemy You Can't See: An Investigation of the Disruption of Dark Networks," International Security Studies Section (ISSS)/International Security and Arms Control Section (ISAC) Conference, October 2011, Irvine, California.

"The Enemy You Can't See: An Investigation of the Disruption of Dark Networks", Economic Science Association, November 2011, Tucson, Arizona.

"Crime, Punishment, and the Emergence of Cooperation in an Adversarial Setting," USC LABEL conference on experimental economics, May 2012, Los Angeles, California.

"Crime, Punishment, and the Emergence of Cooperation in an Adversarial Setting", International Economic Science Association June 2012, New York City, New York.

Anthony McGann

"Estimating the median voter from aggregate data: the Stimson dyad ratio algorithm." Contemporary Applications of the Spatial Model, Center for Advanced Studies in the Social Sciences, Juan March Institute, Madrid April 27th and 28th, 2012.

Andrew Noymer

"Life expectancy during the great depression in eleven European countries". Tim-Allen Bruckner, Andrew Noymer, Ralph Catalano. Session 1. European Population Conference, Stockholm, 2012.

"Influenza as a proportion of pneumonia and influenza mortality: United States, 1959–2007". Andrew Noymer and Ann M. Nguyen. Session 52 & A Similar Pattern of Tuberculosis Mortality & Decline in the United States and Thailand, before HIV. Andrew Noymer, Amara Soonthorndhada and Patama Vapattanawong. Poster Session 7. PAA, San Francisco, 2012.

"Influenza and tuberculosis". Session IV. [by invitation]. Third Annual African Network for Influenza Surveillance and Epidemiology (ANISE), Nairobi, 2012.

"Epidemics3": Third international conference on infectious disease dynamics, Influenza as a proportion of pneumonia and influenza mortality: United States, 1959–2007. (poster) & Influenza and pneumonia mortality do not co-move over time at all ages: An analysis of the United States, 1959–2007. (poster) Andrew Noymer and Ann M. Nguyen, Boston, 2011.

"After 1918: History and politics of influenza in the 20th and 21st centuries", The 1918–19 influenza pandemic affected the decline of tuberculosis. [by invitation]. L'École des hautes études en santé publique, Rennes, 2011.

Colloquia: What's flu got to do with it? The payoff of influenza studies for demography and sociology: Vienna Institute of Demography, 28 September 2011; Wirtschaftsuniversität Wien, 5 October 2011; Institute for Mathematical Behavioral Sciences, UC Irvine, 29 October 2011; Population Studies Training Center, Brown University, 3 November 2011; Centre d'Estudis Demogràfics, Universitat Autònoma de Barcelona, 10 November 2011; Istituto Superiore di Sanità, Rome, 19 December 2011; Public Health, UC Irvine, 9 January 2012; Statistics, UCLA, 10 April 2012.

Lisa Pearl

"*Two good ways to use computational methods to understand language (Acquisition edition)*". Mayfest 2012, University of Maryland, College Park, May 2012.

"*Testing the Universal Grammar hypothesis: The contribution of computational modeling.*" Linguistics Symposium 2012, CSU Fullerton, California, April 2012.

"*Inferring Mental States from Language Text."* Center for Machine Learning and Intelligent Systems AI/ML Seminar Series, University of California, Irvine, February 2012.

"*Syntactic islands without Universal Grammar.*" Workshop on Input & Syntactic Acquisition 2012, Portland, OR. (with Jon Sprouse), January 2012.

January 2012, "*Syllable-based Bayesian inference: A (more) plausible model of word segmentation.*" (with Lawrence Phillips), Workshop on Psychocomputational Models of Human Language Acquisition, Portland, OR.

"*Syllable-based Bayesian inference: A (more) plausible model of word segmentation*." (with Lawrence Phillips), 86th Annual Meeting of the Linguistic Society of America, Portland, OR. (38% talk acceptance rate), January 2012.

"*On the meaning of Free Relative clauses and Plural Definite Descriptions*: *Evidence from acquisition"*, Harvard-Australia Workshop on Language, Learning, and Logic, Sydney, Australia. (with Ivano Caponigro, Neon Brooks, & David Barner), August 2011,

"*How Far Can Indirect Evidence Take Us? Anaphoric One Revisited.*" (with Ben Mis), 33rd Annual Conference of the Cognitive Science Society, Boston, MA August 2011.

Dale Poirier

"Multivariate Versus Multinomial Probit: When are Binary Decisions Made Separately also Jointly Optimal?" (with Deven Kapadia). UCI, May, 2012; Korean Economics Association, Seoul, Korea. International, June 2012; Society for Bayesian Analysis, World Meeting, Kyoto, Japan, May 2012.

Donald Saari

Plenary talk, "Mathematics and the mystery of "dark matter." Math Assoc. of America, Fall Meeting, So Cal - Nevada Sect. CSU LA, Oct. 2011.

"Unexpected problems coming from the usual `reductionist' approach". NSF Conference: Carnegie-Mellon University April 2012.

Averaging Methods for Multiscale Phenomena in Engineering Materials, Keynote talk:
Roundtable, ``Puzzles in the Law", Univer. of Illinois College of Law (Galena, Il.), June 2012
"The reductionist philosophy: From Arrow's Theorem to Perversities in Law"

"Using mathematics to explain mysteries of voting and decision theory", Lecture: UCI Math undergraduates, Sept 2011.

"Complexity theory applied to voting theory", PACM colloquium, Princeton University , October 2011.

"Mathematics and the mystery of dark matter", Inaugural "Koh Lecture" (university public lecture). North Carolina State University, April 2012.

"Using mathematical symmetries to explain social science puzzles", Colloquium, Dept. of Mathematics, North Carolina State University, April 2012.

"Dark Matter! What is that mysterious thing?". CEO Round Table, Santa Fe, NM, April 2012;

"We vote, but do we elect whom we really want? Math Across Campus (university public lecture), University of Washington, Seattle, May 2012.

"From Dark Matter to the Evolution of the Universe". Physical Sciences, Breakfast Lecture Series (public lecture), UCI, May 2012

Stergios Skaperdas

"On the Use and Abuse of 'As if' Assumptions in Economics," in conference on "Rationality and Irrationality: Game-Theoretical and Other Perspectives," Stockholm School of Economics, June 2011.

"Guns, Lawyers, and Money: Economic Consequences of Costly Conflict," in CESifo Summer Institute conference on ""The Economics of Conflict – Theory and Policy Lessons," Venice, Italy, 20 - 21 July.

"Trade in the Shadow of Power," in Annual ISSS/International Studies Association Conference, October 13-15, 2011, Irvine.

"Contests for Power," IMBS Colloquium, November 17, 2011.

"The Lingering Effects of the Great Recession," lectures at the Osher Lifelong Learning Institute (OLLI), Irvine, 22 and 29 of November, 2011.

"Guns, Lawyers, and Money: Economic Consequences of Costly Conflict," in "Young Researchers Workshop on Contests and Tournaments" Technical University of Berlin, Germany, December 2-3, 2011.

"Staying the Course vs. Default and Exit" in Economist Conference "Debating Europe and its Currency: What's the best for Greece after all?" Ledra Palace Hotel, Athens, Greece, December 12, 2011.

"Guns, Lawyers, and Money: Economic Consequences of Costly Conflict," in conference on Trygve Haavelmo's 100th birthday, University of Oslo, Norway, December 13-14, 2011.

"Staying the Course vs. Default and Exit," at the U.S. State Department conference on "Greece: Thirty Years of EU Membership," Washington DC, December 19, 2011.

"Guns, Lawyers, and Money: Economic Consequences of Costly Conflict," Economics Department Theory Seminar, UC Riverside, January 25, 2012.

"The Eurozone Crisis in Greece: Symptoms, Causes and Prospects," Colloquium at the UCLA Center for Social Theory and Comparative History, January 30, 2012.

"Guns, Lawyers, and Money: Economic Consequences of Costly Conflict," at the conference on "Resource Insecurity, International Trade and the Environment," University of Exeter Business School, UK, May 17-18, 2012.

Ken Small

Presentation at Kuhmo-Nectar Conference on Transport Economics, Endogenous scheduling preferences and congestion, Stockholm, July 1, 2011:

Hal Stern

"The Bowl Championship Series: Still Crazy After All These Years", Joint Statistical Meetings, Miami, FL, August 2011.

"Using Spatial Information in Genomewide Association Studies", Department of Applied and Computational Mathematics and Statistics, Notre Dame University, Notre Dame, IN, December 2011.

"The Bowl Championship Series: Still Crazy After All These Years", Department of Applied and Computational Mathematics and Statistics, Notre Dame University, Notre Dame, IN, December 2011

"Using Spatial Information in Genomewide Association Studies", Statistical Sciences Group, Los Alamos National Laboratory, Los Alamos, NM, April 2012

Douglas White

Max Planck Institute for Mathematics in the Sciences. 3 talks. Leipzig, Jun. 1 - July 17, 2011. http://intersci.ss.uci.edu/wiki/pdf/NewsletterNov2010-SocDyn&Complexity4pp.pdf

"Effects of structural cohesion in forager networks on the evolution of cooperation". Douglas White & Tolga Oztan. San Diego Supercomputer (UCSC) Complex Networks Seminar, UCSD, San Diego, June 2012.

"Cohesive Subnetwork Causality in the Evolution of Cooperation: How did humans come to be prosocial?" Artificial Intelligence (Elkan) Seminar in Computer Science, UCSD, San Diego, February 2012.

Jack Xin

14th International Conference on Computer Analysis of Images and Patterns, Seville, Spain, August 2011.

Math Bio Science Institute, February 2012.

SRS Labs Inc., Santa Ana, CA, April 2012.

SIAM Imaging Science Conference, Philadelphia, PA, May 2012.

2nd International Conference on Dynamical Systems and Modern Applied Mathematics, Yin Chuan, China, June 2012.

Jack Yellott

Watson, A.B., & Yellott, J.I., Jr., A unified formula for light-adapted
pupil size. Poster presented at the annual meeting of the Association for Research in Vision and Ophthalmology, Ft. Lauderdale FL, May 6, 2012.

Prosthetic Typography: Correcting presbyopic defocus by deconvolving visual objects. IMBS Colloquium, Nov. 10, 2011.

APPENDIX E
FACULTY AWARDS/ACHIEVEMENTS, 2011-12

David Eppstein

Elected as a Fellow of the ACM.

Katherine Faust

UCI Celebration of Teaching, Teaching Excellence Award for School of Social Sciences, 2012.

Chair, American Sociological Association Section on Mathematical Sociology

Vice President, International Network for Social Network Analysis

Steve Frank

Elected fellow, American Academy of Arts and Sciences.

Michelle Garfinkel

I serve on the editorial boards of: Journal of Conflict Resolution, Journal of Macroeconomics, Journal of Economics and Business, Defence and Economics, European Journal of Political Economy.

Kimberly Jameson

Section Editor, The Encyclopedia of Color Science and Technology, (section on Color Cognition and Language).

Ad Hoc Reviewing: Journal of Vision; Color Research & Application; Vision Research; National Science Foundation

Robin Keller

Editor-in-Chief, *Decision Analysis,* January 2007-Dec. 2009 (term 1) and January 2010-December 2012 (second and final term)

National Academies Committee Membership:

> U. S. National Committee for the International Institute for Applied Systems Analysis (IIASA), Board on International Scientific Organizations; appointed as member by Ralph Cicerone, Chair of the National Research Council and President of National Academy of Sciences, January 2007-Dec. 2009 (term 1), January 2010- December 2012 (term 2).

Decision Analysis Society of INFORMS:
Publications award competition in 2012, based on 2010 paper, member of committee

UC Service Role:

The Paul Merage School of Business at UCI:
Director, Doctoral Program, 7/2009-6/2011; 7/2011-6/2013

Igor Kopylov

Associate Editor: Theoretical Economics

Referee reports: American Economic Review, Econometrica, Journal of Economic Theory.

Michael Lee

Co-author on paper, "A model-based approach to measuring expertise in ranking tasks", 2011. Best applied cognitive modeling paper award at the 33rd Annual Conference of the Cognitive Science Society.

Simon Levin

Journal of Mathematical Biology, 2012, Special Issue in Honor of Simon Levin's 70th Birthday.

Co-author of Mercer-Award winning paper, "Tree cover in sub-Saharan Africa: Rainfall and fire constrain forest and savanna as alternative stable states" (with C. Staver and S. Archibald), published in *Ecology* in 2011 (George Mercer Award, Ecological Society of America), awarded 2012.

National Associate, National Research Council of the National Academies (2011).

Theoretical Ecology 4(2), 2011, Special Issue in Honor of Simon Levin's 70th Birthday.

R. Duncan Luce

American Philosophical Society, Patrick Suppes Award in Psychology, April 30, 2012.

UC Constantine Panunzio Distinguished Emeriti Award, June 5, 2012, UCI.

Michael McBride

Director of newly constructed Experimental Social Science Laboratory, UC Irvine

Quoted in Lisa Miller, "The Religious Authorities and Pundits are Wrong: Technology is Good for Religion," Washington Post, 1 June 2012.

Organizer, Democracy and Conflict Lunch, Center for the Study of Democracy, 2011-2012

Andrew Noymer

During the period under review, I collaborated closely with IIASA, the International Institute for Applied Systems Analysis in Laxenburg (near Vienna), Austria.

Public service: Member, Metrics Group for California HAI (Hospital Acquired Infections) Reporting.

Donald Saari

Fellow: Society for Advancement of Economic Theory.

Designated *Lifetime "National Associate"* of the National Research Council.

A chapter is devoted to me in the book "*Fascinating Mathematical People*", ed. D. Albers, & G. L. Alexanderson, Princeton University Press.

Stergios Skaperdas

Keynote Address at CESifo Summer Institute conference, Venice, Italy, July, 2012.

Ken Small

Advisory Committee, Center for Energy Economics and Policy, Resources for the Future, starting

Peer Review Panel for Ridership and Revenue Forecasting, California High-Speed Rail

Advisory Committee, Center for Energy Economics and Policy, Resources for the Future.

President, International Transportation Economics Association.

Hal Stern

Editor, Applications and Case Studies Section, *Journal of the American Statistical Association* (2010-2012)

Member, Committee on National Statistics (CNSTAT) (2008-2014) – Committee of the National Research Council of the National Academies of Science that tries to improve statistical methods and information for public policy --- just reappointed for second term.

Douglas White

Continuation as External Research Professor, Santa Fe Institute.

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
*	Royce Anders	Batchelder
*	Kalin Agrawal	Batchelder
*	Gregory Alexander	Batchelder
*	Jerry Benzl	Kaminski
	Justin Bruner	Huttegger
	Eleanor Brush	Levin
	Andrew Colopy	McGann
**	Jonathan Cook	Saari
	Scott Crawford	Smyth
	Tyler Dean	Chubb
	Adrian de Froment	Levin
	Chris DuBois	Smyth
*	Michael Ernst	Maddy
*	Robert Forbes	Narens
	Jimmy Foulds	Smyth
	Andrew Frank	Smyth
*	Matthew Glass	Maddy/Huttegger
*	Giorgio Gosti	Batchelder
*	Diego Grijalva	Skaperdas
	Christian Herrera	Chubb
	Jennifer Herera	Carvalho/Huttegger
*	David Hewitt	McBride
	Harry Hong	Brownstone
*	Arvin Hsu	Sperling
	Candice Huynh	Keller
*	Lorien Jasny	Butts
	Dan Jessie	Saari
	Deven Kapadia	Poirier
**	Ryan Kendall	Saari
**	Steven Kies	Chubb
*	Jinwon Kim	Brueckner
	Frederico Llarena	de Figueiredo
	Alicia Lloro	Brownstone
*	Phillip Li	Poirier/Brownstone
*	Dan Luo	Brueckner
	Joshua Malnight	Uhlaner
	Daniel Mann	Chubb
*	Brian Marion	Hoffman
	Justin Mark	Hoffman
	Tomas McIntee	Saari

*	Ray Mendoza	Komarova
	Peter Miller	Uhlaner
*	Hyeok Ki Min	Skaperdas
	Ofer Mintz	Keller
*	Arshad Mohammad	Brownstone
	Cailin O'Connor	Huttegger
*	Kerem Ozkan	Braunstein
*	Tolga Oztan	White
*	Darren Peshek	Hoffman
	Lawrence Phillips	Lisa Pearl
	James Pooley	Lee
*	Ashish Rajbhandari	Poirier
	Jacquelyne Rische	Komarova
	Ryan Shirah	Uhlaner
**	Samuel Thorpe	Srinivasan
	Heidi Tucholski	Saari
**	Elliott Wagner	Skyrms/Huttegger
*	Yitong Wang	Keller
	John Wilkinson	Komarova
*	Dan Wolf	Kaminski
*	Shunan Zhang	Lee

(ii) (MA Degrees in Mathematical Behavioral Science during academic 2010-11

Matthew Feldmann
Jonathan Cook

APPENDIX G
VISITORS' LETTERS

Donald G. Saari, Director
Institute for Mathematical Behavioral Sciences
University of California
Irvine, CA 926797-5100

Dear Don,

This year, I was able to spend 5 weeks at UCI, primarily based in IMBS, but with an affiliation with Ecology and Evolutionary Biology. As such, I attended seminars in both departments, and met regularly with the junior faculty in EEB to discuss common interests and ways to build activities on campus. I now have an NSF grant together with Profs. Adam Martiny and Steve Allison on ocean dynamics, and we found time to work together during my visit. A manuscript with Martiny is about to be submitted.

I also interacted with a range of other faculty, including Saari, Frank, Wan and Nie, to discuss common research interests. My postdoctoral fellow, Erol Akcay, made several visits, and delivered a seminar on our joint work to the IMBS Colloquium. I also participated in several meetings of the Saari- Skyrms-Narens class.

I participated in the January IMBS Workshop on Religions and Social Norms, and spoke on "Consensus and Collective Decision-Making." I also attended the regional NAS meeting at the Beckman Center. Outreach: I lectured to the environmental club at Troy High School, in Fullerton, on "Sustainability."

Other campuses: I gave an invited evening lecture at U.C. Davis on "The Emerging Challenge of Sustainability."

Throughout the period, I carried out research on public goods, on ocean modeling, and on other topics.

Simon Levin
Professor, Ecology and Evolutionary Biology
Princeton