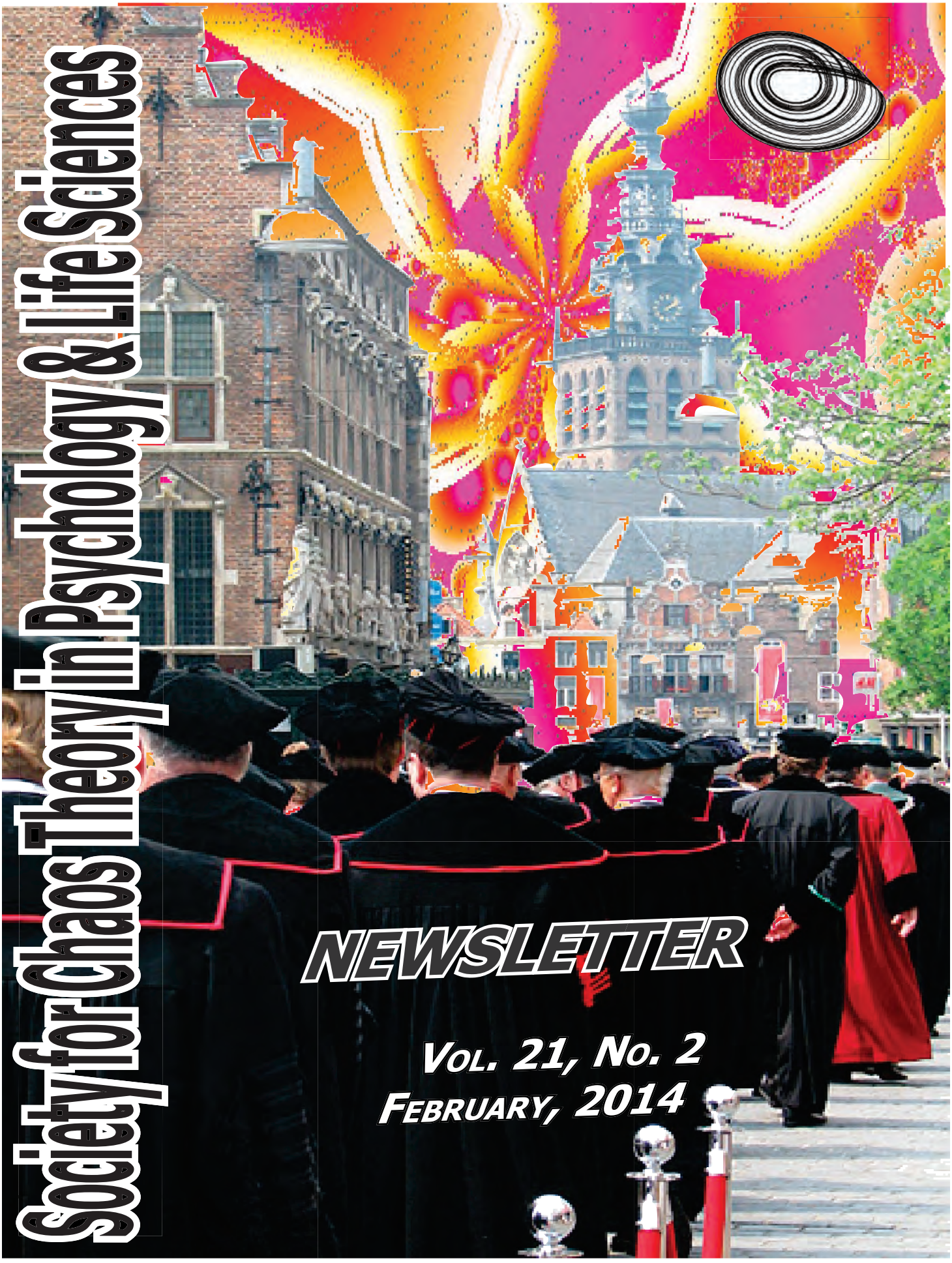
Society for Chaos Theory in Psychology & Life Sciences



NEWSLETTER

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Society for Chaos Theory in Psychology & Life Sciences

6th International Nonlinear Science Conference 2014
20-22 March 2014
Nijmegen, Netherlands

The **Society for Chaos Theory in Psychology & Life Sciences** is pleased to announce its **keynote speakers**:

Karl Friston, Ph.D., FRS
University College of London

Karl Friston

Free Energy, the Brain, and Life as We Know it

How much about our interaction with – and experience of – our world can be deduced from basic principles? This talk reviews recent attempts to understand the self-organised behaviour of embodied agents, like ourselves, as satisfying basic imperatives for sustained exchanges with the environment. In brief, one simple driving force appears to explain many aspects of action and perception. This driving force is the minimisation of surprise or prediction error. In the context of perception, this corresponds to Bayes-optimal predictive coding that suppresses exteroceptive prediction errors. In the context of action, motor reflexes can be seen as suppressing proprioceptive prediction errors. We will look at some of the phenomena that emerge from this scheme, such as hierarchical message passing in the brain and the perceptual inference that ensues. I hope to illustrate these points using simple simulations of perception, action and action observation.

Karl Friston *is a theoretical neuroscientist and authority on brain imaging. He invented statistical parametric mapping (SPM), voxel-based morphometry (VBM) and dynamic causal modelling (DCM). These contributions were motivated by schizophrenia research and theoretical studies of value-learning – formulated as the dysconnection hypothesis of schizophrenia. Mathematical contributions include variational Laplacian procedures and generalized filtering for hierarchical Bayesian model inversion. Friston currently works on models of functional integration in the human brain and the principles that underlie neuronal interactions. His main contribution to theoretical neurobiology is a free-energy principle for action and perception (active inference). Friston received the first Young Investigators Award in Human Brain Mapping (1996) and was elected a Fellow of the Academy of Medical Sciences (1999). In 2000 he was President of the international Organization of Human Brain Mapping. In 2003 he was awarded the Minerva Golden Brain Award and was elected a Fellow of the Royal Society in 2006. In 2008 he received a Medal, Collège de France and an Honorary Doctorate from the University of Yorkin 2011. He became of Fellow of the Society of Biology in 2012 and received the Weldon Memorial prize and Medal in 2013 for contributions to mathematical biology.*

Peter C.M. Molenaar
The Pennsylvania State University

Peter C.M. Molenaar

Recursive Estimation for Nonergodic Stochastic Dynamic Systems

Ergodic theory is shown to have fundamental consequences for the statistical analysis of psychological processes, the most important of which is the necessity

to focus on intra-individual variation in order to obtain valid results for processes that are heterogeneous across subjects and/or across time and place. Innovative recursive estimation techniques are presented which appropriately accommodate such heterogeneity. Examples presented include a) nonlinear oscillators undergoing bifurcations in human movement research; b) stochastic generalization of catastrophe theory in applications to cognitive development; c) bilinear connectivity modeling of fMRI BOLD series in neuro-cognition; d) estimation of subject-specific heritabilities in the context of nonlinear epigenetics; e) recursive estimation of Lyapunov coefficients of chaotic time series. In closing, some general issues in stochastic bifurcation analysis are addressed.

Peter C.M. Molenaar *is distinguished professor of Human Development at Penn State University in the US. The general theme of his work concerns the application of mathematical theories to solve substantive psychological issues. One concerns the application of mathematical singularity theory (in particular catastrophe theory) to solve the longstanding debate about the reality of developmental stage transitions. Another theme relates to the application of nonlinear multivariate statistical signal analysis techniques to solve the problem of mapping theoretical models of cognitive information-processing onto dynamically interacting EEG/MEG neural sources embedded in spatio-temporally coherent backgrounds. Adaptation and extension of these techniques to connectivity mapping based on fMRI BOLD time series. Another central theme of prof. Molenaar's work is mathematical-statistical ergodic theory to study the relationships between intra-individual (idiographic) analyses and inter-individual (nomothetic) analyses of psychological processes. He has proven, based on the classical ergodic theorems, that for nonstationary processes such as learning and developmental processes it is necessary to focus on intra-individual variation (person-specific time series analysis). He has also done work on advanced multivariate analysis techniques in quantitative genetics and developmental psychology, the application of adaptive resonance theory (ART neural networks) to study the effects of nonlinear epigenetical processes and use of mathematical biological models of self-organization. One of the more recent topics relates to the application of engineering control techniques to optimally guide psychological and disease processes of individual subjects in real time, that is, real-time optimal treatment of individual patients with type-1 diabetes and asthma under normal living conditions.*

--The SCTPLS Conference Committee

Anna Bosman, Conference Chair,
Radboud University, Netherlands;
Jose Navarro, *Faculty of Psychology, University of Barcelona, Spain;*
Dimitrios Stamovlasis, *Faculty of Philosophy, University of Thesseloniki, Greece;*
Stephen J. Guastello, *Professor of Psychology, Marquette University, Milwaukee, WI USA;*
David Pincus, *Assoc. Professor of Psychology, Chapman University, Orange, CA USA*

Nijmegen. Professors Downtown

News from SCTPLS Labs

More Good News from Members' Labs
By **David Pincus**
Associate Professor, Psychology, Chapman University, Past President, SCTPLS

Once again we had a nice response to our call out for news from our fellow members who are grinding away at the walls of normalcy. Have a glance at the work of your fellow members, reach out, read, and support one another's work. After all, if we don't know what we are doing, who will? As always, please send me your news and updates and we will include them in future columns (send to pincus@chapman.edu).

Polemnia G. Amazeen, Associate Professor
Department of Psychology
Arizona State University

Updates from the Dynamics of Perception, Action, and Cognition Lab at Arizona State University: Drs. Polemnia and Eric Amazeen have been applying the tools of dynamical systems analysis to answer various questions about social coordination. We typically find that coordination between persons follows the same dynamical principles as does coordination within a person. That finding suggests that coordination is a process that requires shared information rather than central control. Our research on the generalizability of dynamical models to dyads and teams is funded by NSF and was recently published in *Experimental Brain Research*. We have been exploring new methods, using the tools of multifractal analysis to extract team-level experiences from the brain activity of individual team members. That work is funded by DARPA and will be published in *Social Neuroscience* later this year. Finally, we have been considering the mechanisms for coordination across people. We found that the nature of information shared between people is in spatial coordinates rather than egocentric bodily coordinates. We also found that participants stabilize difficult unidimensional tasks by recruiting additional degrees of freedom. That research was published in *Journal of Experimental Psychology: Human Perception and Performance* and *Human Movement Science*, respectively.

Yuji Aruka
Chuo University, Tokyo

Yuji is now the Co-editor of the book series, "Evolutionary Economics and Social Complexity Science" which will be published by Springer. The first volume of the series will be Aruka's title, "Evolutionary Foundations of Economic Science: How can scientists study evolving economic doctrines from the last centures?" is scheduled to appear in 2015. More information about the series will appear in the next issue of the Newsletter.

Umberto Cesar Corrêa, Associate Professor of School Physical Education and Sport of the University of São Paulo

Two main research interest: (i) to explain the motor skill learning as an adaptive process [e.g. Corrêa, et al. (2012). The game of futsal as an adaptive process. NDPLS, 16, 185-204; Tani, Corrêa, et al. (2014). An Adaptive Process Model of Motor Learning: Insights for the Teaching of Motor Skills. NDPLS, 18, 47-65.], and (ii) to understand the decision making process in sports contexts based on a dynamical ecological view [e.g. Corrêa, U.C., Vilar, L., Davids, K., & Renshaw, I. (2012). Informational constraints on the emergence of passing direction in the team sport of futsal. European Journal of Sport Science, DOI:10.1080/17461391.2012.730063].

Kevin Dooley
Arizona State University

Over the last five years most of my efforts have been devoted to The Sustainability Consortium (TSC, http://www.sustainabilityconsortium.org/) where I am Chief Research Officer. TSC's mission is to develop science-based tools, in a multi-stakeholder environment, that help decision-makers improve the sustainable attributes of consumer products. Our 80+ corporate members include many of the world's largest retailers, manufacturers, and suppliers, and we work with civil society and government organizations like WWF, CARE, and EPA.

Our main focus has been to develop tools that identify the environmental and social "hotspots" associated with the life cycle of a consumer product – from cradle to grave – and the improvement opportunities that can address those hotspots. We then develop key performance indicators to help manufacturers measure their performance and share that data with retailers like Walmart and Marks & Spencer. Our research teams use a systematic meta-analysis approach to identify issues and opportunities in product life cycles, and we assess hotspots using a formal decision tree that examines the quality and quantity of evidence. We have developed tools for over 500 different types of product categories, from laundry detergent to packaged cereal to coffee makers.

While our work is not explicitly using complexity science or nonlinear dynamics, the lens of complexity has been useful in developing and managing TSC, and learning how our disciplines and institutions think about and frame sustainability issues. One problem that I look forward to working on over the next few years is the landscape and industrial ecology. We have traditionally managed environmental and social issues and organized our disciplines in ways that give primacy to a "spatial" frame, e.g., the biodiversity in a watershed, or soil erosion in a particular forest, or the level of fair income access in a municipality. It makes sense that institutions and disciplines would align this way as for most of history economic activity has also been mostly local.

As supply chains and middle-class consumption become global, the impacts of products and their life cycles are not determined spatially contingent – the pollution to a local river from a factory in Asia and the disturbance to wildlife habitats near a California seaport and the increased load to landfills in Arizona can all be connected by a single product value chain. Our current sustainability-related institutions and disciplines incur risk by ignoring the underlying (economic) causes of the impact-generating activities that are attended to and managed locally. A global economy makes physical distance only one factor in understanding how our

physical regions interplay and attempting to enable improved outcomes.

Caroline Fielden

I am a PhD student with the School of Psychology at the University of Sydney. My research involves trying to better understand personality traits by applying a complex systems approach to behavioural data. Early findings are promising, showing that there are relationships between individual patterns of behaviour, and self-report measures of traits that are not identified using standard methodologies. At the moment I am preparing to collect more data, while starting to write up the findings from my research so far.

Using a complex systems approach has had some challenges, with the methodologies particular to the approach not well known within the School of Psychology. It has been exciting though to find a few senior members of staff who are interested in the methodologies, and the philosophies that guide them. There is even talk of a discussion/reading group finally forming. While nothing is finalised yet, it is envisioned that this group will have a number of aims. These will include seeking to better understand how a complex systems approach might enable a better understanding of psychological phenomena, and to identify and share resources that might enable this.

I am hoping this will also give me the impetus to refocus some energy on the Australian SCTPLS facebook page. It has been very quiet for the last six months, with me needing to focus my energies on my PhD, and better learning the methodologies that are core to my thesis. I am hoping that the formation of a discussion group will give the page some focus, and direct its activities towards concrete goals.

Terrill L. Frantz, Assistant Professor of Management and Director of Global Development
Peking University HSBC Business School, Shenzhen China

Now in my second career, I am an Assistant Professor of Management at Peking University HSBC Business School in Shenzhen China, where I also serve as the Director of Global Development. I serve as the Web Manager for SCTPLS and work with the NDPLS journal team; been doing so for more than 10 years...ouch! Recently, I am close to completing the post-defense changes to my second doctorate thesis--entitled "A Behavioral Theory of the Merger: Dynamics of the post-merger integration process"--this one for the School of Computer Science at Carnegie Mellon University, which explains my choice of the title. I focus my research and teaching on Post-Merger Integration of organizations, but find myself in many adjust areas such as Social Network Analysis, International Business, Computer Software, Decision Sciences, etc. I teach in an adjunct capacity at several universities in the US and Europe, as well as one in North Korea. I spend a lot of my time in Hong Kong where I am presently the President of the Rotary Club of Hong Kong, which is a way to stay directly involved in the global finance and business communities, aside from my life in academics.

Albert R . Gilgen

I have lived in Cedar falls, Iowa since 1973. I served as the Head of the Psychology at the University of Iowa until 1993 and retired from the university in 2001. I have worked off and on on a manuscript tentatively entitled "Persistent and Recent Issues in American Psychology." Don't know if I will ever finish it. Unfortunately, Carol my wife of 57 years, died in 2011 so I am often lonely . Fortunately, most of my extended family live close by.

Stephen Guastello
Marquette University

The project on cognitive workload and fatigue has been making steady progress. The vigilance experiment with the VR security camera that was presented at the SCTPLS conference in Baltimore in 2012 has resulted in three recent publications:

Guastello, S. J., Malon, M., Timm, P., Weinberger, K., Gorin, H., Fabisch, M., & Poston, K. (2013, on-line first). Catastrophe models for cognitive workload and fatigue in a vigilance dual-task. *Human Factors*. DOI: 10.1177/001872081350877

Guastello, S. J., Shircel, A., Malon, M., & Timm, P. (2014, on-line first). Individual differences in the experience of cognitive workload. *Theoretical Issues in Ergonomics Science*. 10.1080/1463922X.2013.869371

Guastello, S. J. (2014). Vigilance phenomena, cognitive workload and fatigue. *American Psychologist*, *69*, 85-95. DOI: 10.1037/a0034941.

The first publication from CWLF in financial decisions that was presented at the SCTPLS conference in Portland in 2013 will be appearing in NDPLS later this year; more writing is underway with that phase of the project. The latest completion involves the use of N-back tasks, which are, as a rule, very demanding on working memory. The first report will appear at the INSC conference in Nijmegen, Netherlands next month.

In a related but different project, the second edition of my human factors textbook rolled off the press in December. Please see the Nonlinear Dynamical Bookshelf section of this *Newsletter* for further details.

Robert Hristovski
Faculty of Physical Education,
University of Ss. Cyril and Methodius, Skopje, Republic of Macedonia

Recently we have published a book: K. Davids, R. Hristovski, D. Araújo, N. Balagué, C. Button, & P. Passos (Eds.),***Complex systems in sport*** London: Routledge. www.routledge.com/books/details/9780415809702/

During the last two years I work on how one can use experiential learning of unifying concepts offered by complex systems approach by the means of physical activities.

Adam Kiefer
Director, TEAM VR Laboratory
Division of Sports Medicine

Dr. Kiefer is the director of the Training Enhancement and Analysis of Movement Virtual Reality (TEAM VR) Laboratory where he integrates innovative technologies such as augmented and virtual reality, eye tracking, and biofeedback tools with established training practices to improve training outcomes. Specifically, his research takes a complex systems approach to performance enhancement and injury prevention in sport in order to uncover the perceptual and biomechanical control variables that modulate the organization of perceptual-motor coordination and control. He employs nonlinear time series analysis methods to index changes in the behavioral dynamics (i.e., identify order parameters) of the observed system. He then applies dynamical system modelling techniques to uncover lawful relations between order parameters and the variables that guide the system through potential states of behavior (i.e., control parameters). Through this approach he is able to ask novel research questions with regard to the development, learning, and control of coordination at many different scales--from the perceptual-motor control of the individual to the broader scale of multi-agent coordination--in a variety of contexts.

Gus Koehler
Time Structures, Inc.
Sacramento, CA

Producing business and workforce and employment projections for California Community Colleges in the LA, San Francisco Bay Area, San Diego, and the Inland Empire of CA's CleanTech and Advanced Transportation industry sectors and advising on a long term strategies to address workforce training and business development in a practical, cost effective and cost beneficial manner. We are also continuing to look for a large corporate partner to help fund development of "Naked Time", our theoretical approach to a forward looking computer simulation based in temporal perception as a correction to a firm's or government's time series data.

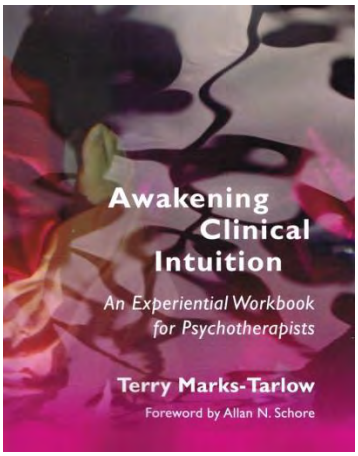
Stanley Krippner
Saybrook University

Stanley Krippner hosted a book launch (in February) for THE THERAPEUTIC USE OF AYAHUASCA, edted by Biatriz Labate and Clancy Cavner. Both editors spoke at the book launch, held at Saybrook, as well as several chapter authors. Stanley's latest book is the second edition of THE VARIETIES OF ANOMALOUS EXPERIENCE: EXAMINING THE SCIENTIFIC EVIDENCE, co-edited with Etzel Carden and Steven J. Lynn, published in 2014.

Robert J. Marshall
Psychologist-Psychoanalyst

I am expanding an article in "Modern Psychoanalysis" 2011, Vol.36: 52-94 entitled "On Mirroring, Fractals, Chaos, and Psychoanalysis" where I took a speculative leap from some aspects of fractal theory to the repetitions found in psychoanalytic therapy. My current interest is in following Mandelbrot's surmise that a fractal environment is healthier than a linear one.. I'd be happy to hear from anyone who can shed some light on this hypothesis

Terry Marks-Tarlow
Santa Monica, CA



I am pleased to announce the release by Norton of *Awakening Clinical Intuition*. This experiential workbook complements its parent book (*Clinical Intuition in Psychotherapy*). It is filled with embodied exercises, guided imagery, and other techniques to open focus, cultivate presence, and hone attunement to what is unique during each clinical moment. The book can be ordered from http://tinyurl.com/awaken-clinical-intuition which connects to Amazon.com. There will be a book signing party on March 2, to be held at the home of Patricia Greenfield in Venice, CA, for those who live in the region.

Finally, I am launching a monthly, Saturday workshop series as an experiential way to move through the book, chapter by chapter. This intimate opportunity is limited to 12 people, so please let me know immediately if you are interested marks-tarlow@hotmail.com . I especially seek inroads into psychotherapy training courses. I believe a focus on clinical intuition counterbalances the group perspective of empirically validated and manualized approaches. If you have colleagues who might use this material in their classes, please let me know, and I will have a book sent to them by Norton. Thanks very much for your support!

Alan McDonnell
Emergent Dynamic Technologies Ltd

I am a criminologist working in group decision making. Regarding current activities I have given thought to new findings from Nummenmaa, L.,Hari,E., Hietanen,J (2013). Bodily maps of emotions along with Penrose.,& Hameroff R. (2013) " Consciousness in the universe: A review of the 'Orch OR' theory" which I think contributes some interesting findings to my previous review. I am still interested in the nature of how the fabric of matter and energy influences how data moves between people.

I am currently doing a new review of factors how we choose our professional activities amongst other projects especially how we are influenced by human epigenetics in our choices. I have started a new company Emergent Dynamic Technologies Ltd based in the UK in 2013 to explore research options and over the next few years and apply for funding eventually for experimentation. I hope to collaborate with others interested in improving and understanding group decision making and co-ordination in future.

Derek Paar
Springfield College

Well, the terms "roll on" and "it's cold and snowy" and not much has been going on. I suppose the only thing I've done is to organize a meeting that went well. Let me explain...

I am head of the faculty development committee at Springfield College and each January, the day before classes begin, the person who is head of this committee has to arrange some sort of event which usually means that some-one from some-place talks about some-thing that no one cares about and we all doodle and drift into sleep. I decided to do something different this time. I arranged to have the event off campus at the museum of Springfield history - a glorious new museum celebrating all things spfld-ma-usa: the birthplace of basketball, that we once made Rolls Royce cars, and John Brown once had a shop here and that Fredrick Douglass often came to meet him, and that we built guns for the army, and we built Indian Motocycles (yes that's how it was spelled) and of course Dr. Suess... so 200 faculty traipsed across town to meet with about 50 stakeholders from the city (congressman, mayor, us marshal for Massachusetts, chamber of commerce president, city councillors, school committee people, early education people, arts entrepreneurs, business owners, the publisher of the local newspaper...). After the opening welcomes from various people the participants scattered to take part in ten conversations having to do with how in the world to bring back this aging city which so mirrors our nation (poorer, fatter, less educated...). The topic areas were: the arts, downtown business, regional development, early education, health and nutrition, greenspace and recreation, college/government relations, the media, housing, and public safety. This was likely the first time such a group has ever gotten together in one room (albeit a LARGE room) to talk about the future. the groups were self-organized, they had no agenda, there was no leader and everyone - faculty, stakeholders - loved it. And the best part is that there has been a call to continue the conversations so the IT person at the college and I are arranging to put together a website so that everyone who was there can keep exploring ideas. One of the interesting things coming from this was the revelation to all how each of the "distinct" areas was woven into the other. So, for instance housing issues had so much to do with public safety which had so much to do with downtown development which had so much to do with regional development which so much to do with greenspace... I am convinced that one big reason why this event worked so well was that it wasn't over-organized. The structure was established - the place, the time, the length of discussion, the parsing out of the groups - but after that each person chose for him/herself which group to attend and each group organized itself once seated. Kind of a living example of self-organization. When i gave my little talk to the 250 people who attended I actually got in a plug for chaos/complexity theory and sensitive dependence on initial conditions and the concept of self-organization.

Pedro M Quinteiro
Instituto Universitário de Lisboa, Portugal.

At the current time I am finishing my PhD at Instituto Universitário de Lisboa, ISCTE-IUL, Portugal. During the past 4 years I have been dedicated to the study of individual self-leadership and team adaptation. I am curious about what processes and cognitions promote, or hinder, adaptability in work groups.

More recently, I became aware of the complex adaptive systems theory and over the last year and a half, I have been studying this theory and its applicability to team adaptation. For instance, some of the research I am doing now regards a catastrophe theory approach to adaptive behavior in work teams.

I am also part of a research team that as recently won a grant from the Portuguese Science Foundation, and that is currently working on an agent based model simulation to examine what leadership processes enable adaptation in work teams.

For the future, my goal is to keep exploring the applicability of complex adaptive systems theory to the study of individual and collective behavior at work.

Lisa Taylor-Swanson

Lisa Taylor-Swanson is a practitioner of Traditional East Asian Medicine and a doctoral student in the School of Nursing at University of Washington. She is interested in Complex Adaptive Systems (CAS) of the human body and conceptualizes Traditional Chinese Medicine as a

CAS of healthcare. Her research interests lie in the intersections of integrative healthcare, women's health and neuroimmunoendocrinology. She may be contacted at ljts369@uw.edu

Ken Ware
Queensland, Australia

Ken Ware hosted the grand opening of his NeuroPhysics Institute in metro-Brisbane, Queensland on January 17. The Institute specializes in a unique physical training regime based on nonlinear dynamics principles that has brought considerable benefit to elite athletes and rehabilitation candidates alike. Aspects of Ken's work have been presented at SCTPLS and INSC conferences in recent years, and resulted in this recent publication: Ross, S. N., & Ware, K. (2013). Hypothesizing the body's genius to trigger and self-organize its healing: 25 years using a standardized neurophysics therapy. *Frontiers in Physiology, 4*, article 334.

Feature Article

American Psychologist Retracts Lorenz Attractor: Big Negative for Positive Psychology

Stephen Guastello, Marquette University

Fredrickson and Losada published an article in *American Psychologist* (2005) in conjunction with some issues in "positive psychology" that contained two main points. In one, the authors claimed to have found evidence for a positivity ratio in group dynamics. There was a critical ratio of positive to negative statements made by group members, over which the group "flourished" and under which the group was not successful.

The second main point of the article was that the flourishing-dissipating function of the critical ratio was described by the Lorenz attractor. The support that they offered for the use of the Lorenz model was based on simulation studies showing that a critical parameter in the Lorenz model controlled whether the phase diagram showed its familiar shape or collapsed into a small ball of points. There were no analyses presented in the article, however, that supported the existence of a bifurcation point in the group dynamics data, chaos in any measurement that was included in the studies, or other similarity to the Lorenz attractor.

In a critique that finally appeared in the December 2013 issue of *American Psychologist*, Brown, Sokal, and Friedman addressed several issues that they regarded as independent flaws in the original exposition. Their analysis illustrated a clear lack of support for either the Lorenz model or the existence of critical positivity ratios independent of the model.

One science journalist reported on the controversy and its implications for all of positive psychology, inasmuch as the 2005 article had garnered 350 citations and led to some best-selling books: http://chronicle.com/blogs/percolator/the-magic-ratio-that-wasnt/33279 Another science journalist reported on the back story of how the critique effort got started: http://narrative.ly/pieces-of-mind/nick-brown-smelled-bull/ which also featured commentary by SCTPLS members John Gottman, Stephen Guastello, and David Pincus. Another rendition of the story appear in the London Guardian:

http://www.theguardian.com/science/2014/jan/19/mathematics-of-happiness-debunked-nick-brown.

Apparently Brown had become so fed up with unfounded psychological services sold to his industry that he was compelled to find out what exactly it was that his company had been buying. After digging deeply enough he found the 2005 article with the Lorenz attractor and critical ratios, and the problems summarized above.

Co-author Alan Sokal contributed the portions of the critique concerning the Lorenz model, fluid dynamics, and some thoughts on the use of differential equations in social science research. Sokal achieved some notoriety in the 1990s for a spoof paper (1996a) that he sent to *Social Text* that was loaded with pseudo-physics concepts that he was applying to a social science question. As the article was being published in *Social Text*, he published an explanation of his prank in *Lingua Franca* (1996b) making the point in essence that "humanists lack the sort of intellectual rigor demanded

of those who work in the hard sciences" (Gillespie, 2006, p. 139).

In her reply to Brown et al. (2013), Fredrickson (2013) reported that she was unable to obtain a response from her colleague who was actually responsible for the nonlinear material.

American Psychologist issued a retraction of the portion of the article containing the Lorenz model. Fredrickson, meanwhile, continues to support the critical ratio. Although the critical value was initially specified to four decimal points, it has now morphed into a range of possible values that depend on the situation. Furthermore, negative emotions are recognized to have occasional positive impact on groups, and there might be an inverse-U relationship between positive emotion and positive outcomes.

One of Fredrickson's (2013) concluding comments, ostensibly in support of the use of nonlinear dynamics, is apparently oblivious to the work SCTPLS members have done over the last 20-odd years at least:

"Most valuable to the maturation of this work will be longitudinal measures and experiments that use densely repeated measures of emotions and relevant outcomes alongside pioneering dynamical mathematical and statistical models … Although physics, chemistry, and engineering have more experience modeling complex systems than does psychological science, human emotions are clearly dynamic, multicomponent systems that show self-sustaining upward and downward spirals sensitive to changing circumstances…[which] are likely to become ever more relevant to affective science and positive psychology, as they have for biology, economics, and public health." (Fredrickson, 2013, p. 820).

Many concepts are well developed and supported by real data (Guastello, 2009; Guastello, Koopmans, & Pincus, 2009), including some recent studies on the dynamics of emotion (Isenhower, Frank, & Kay, 2012; Lichtwarck-Achoff, Hasselman, Cox, Pepler, D., & Granic, 2012; Lunkenheimer, Hollenstein, Wang, & Shields, 2012; Snyder, Brockman, & Stoolmiller, 2012). Granted, there were extended times where the relevant information was very dispersed among journals and books where newcomers to the field would not have thought to look, but SCTPLS has taken deliberate steps to establish a journal and two sponsored books (Guastello & Gregson, 2011; Guastello et al., 2009) to get the world up to par and the rest of us moving forward.

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Once again, the *Bookshelf* features books on nonlinear topics and applications with descriptions that people send to us. If you have favorites that haven't appeared in the *Bookshelf* yet, please send your recommendations to the *Newsletter* editor!

Coburn, W. J. (2013). *Psychoanalytic Complexity: Clinical Attitudes for Therapeutic Change*. New York: Routledge. Applies a multidisciplinary, explanatory theory to clinical psychoanalysis and psychotherapy. It carries with it incisive and pivotal attitudes that aim to transform our understanding of therapeutic action and the change process. Here, William Coburn offers a revolutionary and far-reaching counterpoint to the remnants of Cartesianism and scientism, respecting and encouraging human anomaly rather than pathologizing or obliterating the uniqueness of the individual person.

Guastello, S. J. (2014). Human factors engineering and ergonomics: A systems approach (2nd edition). Boca Raton, FL: CRC Press. This textbook is the outgrowth of teaching human factors engineering for more than 25 years to undergraduates, during which time the has changed markedly. Although it still holds true to its original concerns about the person-machine interface, it has expanded to include new developments in stress research, accident analysis and prevention, new applications of neuroscience, group or team dynamics, networks, and nonlinear dynamical systems theory (how systems change over time). Environmental psychology has merged with human factors and ergonomics, although not unilaterally so. The widespread influence of computer-based technologies in recent decades has permeated every aspect of the human-machine system. The systems are becoming more complex, so it should stand to reason that new theories are needed to cope with the new sources of complexity. The largest expansions to the second edition include: (a) the cognition chapter features new developments in working memory, degrees of freedom in cognitive processes, subjective workload, decision-making, and situation awareness; (b) new developments in cognitive workload and fatigue; (c) the complex systems chapter includes additional principles for HFE, networks, multiple person-machine systems, human-robot swarms; (d) accident analysis and prevention includes resilience, new developments in safety climate, and an update to the inventory of accident prevention techniques and their relative effectiveness; (e) the chapter on artificial intelligence includes problems in "big data" mining (f) psychomotor control and human-robot systems; (g) navigation in real-world environments; (h) trust in automation, and (i) augmented cognition. Nonlinear dynamics are particularly prominent in systems concepts (ch. 2), psychophysics (ch. 3), cognitive processes (ch 6), system control (ch 7), stress and fatigue (ch 9), accident analysis and prevention (ch 10), artificial intelligence (ch 12), and complex system issues (ch 13).

Kvitash, V. (2014). *Novel properties of living and other super-complex systems*. Boca Raton, FL: CRC Press. This monograph presents for the first time a complete operational description of Theoretical and Applied Relonics. Relonics is defined as an exact science of universal self-scaled-systems-specific relationships. It is based on systems of axioms of natural measurements and axioms of control-regulation-coordination. Relonics has a fully developed operational technological platform and generic tools for scientific research and practical applications of novel properties of living systems. It introduces 26 novel primary systems-level measures for effective quantitative assessment of systemity, complexity, systems-level properties and systems-level processes.

Letellier, C. (2013). *Chaos in Nature.* Singapore: World Scientific. Chaos theory deals with the description of motion (in a general sense) which cannot be predicted in the long term although produced by deterministic system, as well exemplified by meteorological phenomena. It directly comes from the Lunar theory — a three-body problem — and the difficulty encountered by astronomers to accurately predict the long-term evolution of the Moon using "Newtonian" mechanics. Henri Poincaré's deep intuitions were at the origin of chaos theory. They also led the meteorologist Edward Lorenz to draw the first chaotic attractor ever published. But the main idea consists of plotting a curve representative of the system evolution rather than finding an analytical solution as commonly done in classical mechanics. Such a novel approach allows the description of population interactions and the solar activity as well. Using the original sources, the book draws on the history of the concepts underlying chaos theory from the 17th century to the last decade, and by various examples, show how general is this theory in a wide range of applications: meteorology, chemistry, populations, astrophysics, biomedicine, etc.

Szidarovszky, F., & Molnár, S. (2013). *Introduction to matrix theory: With applications to business and economics*. Singapore: World Scientific. In economic modeling and planning, as well as in business, most problems are linear, or approximated by linear models. Such problems are solved by matrix methods, so the material presented in this book is essential to these fields.

E:CO Special Issue

Emergence: Complexity in Organizations has published a special issue (December, 2013) on Human Interaction Dynamics (HID)—an Emerging Paradigm for Management Research (i-ix) guest-edited by *James K. Hazy & Tomas Backström.* The titles and authors appear below.

Structuration Theories and Complex Adaptive Social Systems: Inroads to Describing Human Interaction Dynamics (1-20) *David R. Schwandt & David B. Szabla*

Construction in Human Interaction Dynamics: Organizing Mechanisms, Strategic Ambiguity and Interpretive Dominance (21-36) *Melissa Edwards & Ellen Baker*.

A Theory of the Emergence of Organizational Form: The Dynamics of Cross-Border Knowledge Production by Indian Firms (37-75) *Gita Surie & Harbir Singh*.

Managerial Rein Control and the Rheo Task of Leadership (76-90) *Tomas Backström.*

Human Interaction Dynamics (HID): Foundations, Definitions, and Directions (91-111) *Jeffrey A. Goldstein*.

Longtime Member, Colleague and Friend **Timothy Perper**

When Tim's wife contacted me by e-mail the last week of January to inquire about his membership and related matters, she couldn't have known the impression and that impact that Tim had made on me so many years ago – I doubt Tim even knew.

I met Tim at our annual conference in Berkeley in 1999. He gave a fascinating and very practical talk on the courtship process - a "ladder" looking model, where the woman leads the man in a subtle dance of increasing or decreasing intimacy over time. Tim's professional story was great – formerly focusing on animal mating behaviors in the tradition of the great field biologists, he moved to studying human courtship sequences in their natural environments – a brilliant little man sitting for hours in bars taking copious detailed notes. "What a career!" I thought to myself.

I was a graduate student at the time, nearly 30, chronically and recurrently single despite what I thought were my best efforts to find intimacy and commitment. I spoke with Tim at length about his work after his talk. However, the fun part came later that night at the banquet. There was a strikingly attractive woman at the conference that year - dark hair and bright blue eyes as I recall - she may have been Icelandic, or that might simply be my false-recollection due to my prior infatuation with the pop singer Bjork? At any rate, she and Tim and I were talking and I noticed that Tim had the most wonderful look on his face – He was *on the job* observing our dynamic. I became immediately aware of the faulty signals I was sending - looking down at my shoes when she made eye contact, failing to respond to her touch on my arm, and so on. I was aware for the first time that my anxiety was getting the better of me – I couldn't follow her lead. Tim simply looked at me with a sweet grin on his face – which said it all.

I grabbed Timothy's book once I got home and found it as fantastic as his talk. I keep a copy on my shelf and have looked back often. This encounter with him honestly set off a process in me that made me much more successful in dating - ultimately courting with great success my current wife (of 11 years now) shortly after reading his book. I have often joked with my wife that Timothy is to credit for our lovely little family (we have a girl - 8 and a boy 6).

As a clinical psychologist I have used Timothy's work as a basis for helping dozens, maybe more, men improve their dating skills - and I've been (very slowly) working on my own book: "Settling for more: The nice guys guide to dating" - which credits Timothy with the primary material on the courtship sequence. If I ever get it completed and in print, it will be dedicated to Tim.

Timothy's positive and playful spirit was so contagious, which is why I've never forgotten our single encounter together at that conference in Berkeley so many years ago. I really wish I had told him more recently how much I have enjoyed and have used his work. That said, it does give me hope that the work each of us does, however small it may seem at the time, and whether we know it or not, will live on and give us some measure of immortality.

The following is Timothy's Obituary re-printed from the Philadelphia Inquirer (http://articles.philly.com/2014-02-04/news/46967431_1_manga-science-fiction-biology)

Timothy Perper, 74, of Bella Vista, a writer and independent researcher on human courtship, died of cardiac arrest Tuesday, Jan. 21, at his home.

As a biology professor at Rutgers University in the 1970s, Dr. Perper became fascinated by how couples meet and then decide whether they are attracted to each other. He obtained a grant from the Harry Frank Guggenheim Foundation to study conversations in bars.

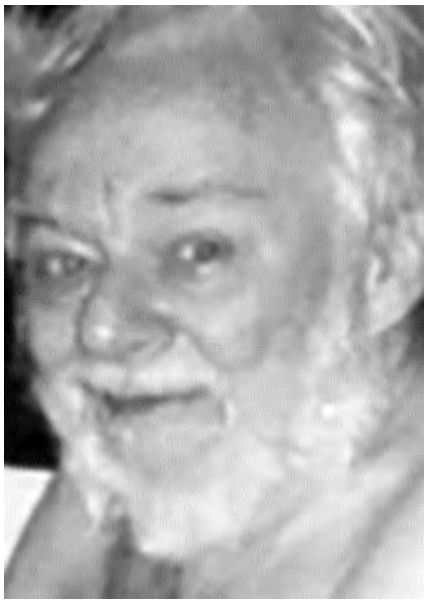
His 1985 book, *Sex Signals: The Biology of Love*, was described in the New York Times as "lively and provocative."

He identified a body language sequence typical of courtship: approach, talk, turn, touch, synchronization. The research attracted the attention of TV interviewers Dr. Ruth Westheimer and Regis Philbin. "We human beings do not fall in love by telepathy: We have to move into proximity with each other," Dr. Perper wrote in Forum magazine in 1987. "It is behavior, vivacity, that attracts people, not looks, beauty, not elegance of dress," he told L.A. Life in 1995.

Later, on learning that Japanese manga comics depicted courtship and sexuality differently than did most American comics at the time, Dr. Perper began to study and write about manga and anime. Those two modes, cartoons and animation with a science fiction or fantasy theme, he said, "provide ways to connect with young people and initiate conversations about sexuality."

He served as book review editor for the Journal of Sex Research, the Journal of Sex Education and Therapy, and

Mechademia: An Annual Forum for Anime, Manga, and the Fan Arts.



Timothy Perper

Dr. Perper also wrote quirky fiction. He delighted in creating oddball comebacks to spam e-mail and devising humorous wordplay.

In recent years, his passion had been creating the adventure Web comic *The Adventures of Princess Adele of Utopia* (www.princessadele.com) in collaboration with Martha Cornog, his wife of nearly 30 years, and the artist Jamar Nicholas.

After growing up in Greenwich Village, Dr. Perper earned undergraduate and doctoral degrees in biology and genetics, both from the City College of New York.

He spent four years in the pharmaceutical industry before joining the faculty at Rutgers, where he taught biology and did research from 1972 to 1979. His research with rats and gerbils involved observing reproductive and parenting behavior.

After obtaining the Guggenheim grant in 1980, he did independent research from home with his wife. He said he never tired of watching people flirt in singles bars. "If the magic is less mysterious than we thought, it is no less entrancing," he told Forum in 1987.

Surviving besides his wife is a nephew, Robert Daniel Ullmann. A memorial will be at 5 p.m. March 14 at the Fleisher Art Memorial, 719 Catharine St. Burial is private.Contributions may be made to the Fleisher Art Memorial via www.fleisher.org, or the Comic Book Legal Defense Fund viahttp://cbldf.org/.

David Pincus, *Past President Society for Chaos Theory in Psychology & Life Sciences.*

24th Annual Conference of the Society for Chaos Theory in Psychology and Life Sciences
July 31 through August 2, 2014, Milwaukee, Wisconsin USA

The Annual Conference of the Society for Chaos Theory in Psychology and Life Sciences is the premier venue for training, networking, and sharing the latest empirical and applied developments in nonlinear dynamics across psychology, the life sciences and beyond. For 23 years (and counting), the Society and its conferences have been founded in the principles of interdisciplinary work, acknowledging the ubiquity of nonlinear dynamics across the behavioral, social, and life sciences. The conference is typically intimate in size. Attendance is typically broad geographically as well, with membership in SCTPLS representing each of the global continents. The program will include workshops, invited addresses, symposia, panel discussions, a poster session, and sessions of individual papers. Advances in basic or applied research, developments in theory, reports of empirical results and methodological papers are all welcome. We continue to encourage all nonlinear scientists, including graduate students who might be finishing up a dynamical thesis or dissertation, to share their ideas through paper presentations, chairing a roundtable session, or by proposing other alternative presentation formats, such as posters, product demonstrations, short workshops, or debates around controversial topics.

Milwaukee. Raynor Library Conerence

Our meetings will be held at the modern gothic campus of **Marquette University, Milwaukee WI**, in the heart of the region of the country informally known as Ecotopia. We will be using the futuristic yet cozy facilities of the **Raynor Library Conference Center** for our conference meetings. On-campus lodging will be available through the Society registration process also. Additional information about these facilities and local attractions will be posted to the lodging page or the local logistics page of this conference web site.

CALL FOR PAPERS AND SYMPOSIA

We invite interested scholars to present and discuss recent developments in nonlinear dynamical system theory, which includes chaos theory, fractals, complex systems and related topics. Over the years, the annual conferences of the Society for Chaos Theory in Psychology & Life Sciences have inspired and supported scholars from an array of disciplines to look at new ways to develop their theoretical and empirical work in an integrated approach to life sciences.

INSTRUCTIONS FOR ABSTRACTS

Abstracts should be between 150-250 words for posters, individual papers, short workshops and other alternative formats. The connection to nonlinear dynamics, chaos, complexity, fractals or related concepts should be clear to the reader. Include organizational affiliation and contact information on each speaker or author.

Abstracts may be up to 500 words for symposia or panel discussion. For symposia, abstracts should reflect the content of EACH speaker's contribution. The format for a symposium is for all speakers to give presentations, followed by or interspersed with discussion. Symposia should present current research within a coherent theme defined by the title and abstract.

For **experimental work**, the background, aims and framework, methods and samples, results, conclusions and Implications should be clear to the reader. For theoretical work, the background, aims and framework, mode of inquiry, outcomes, conclusions and implications should be clear to the reader.

Abstracts for **panel discussions** should provide a brief overview of the topic, and indicate the relevant background of the panelist and sample questions they will address. The format for a panel discussion is an introduction to the topic and the speakers, after which **f**the panelists address as series of questions or issues (rather than just giving a series of presentations).

Abstracts **for workshops** should present state-of-the-art information on techniques useful for conducting research or applications of nonlinear science in the behavioral, social and life sciences. They should be pedagogical in nature. Where applicable, the abstract should emphasize skills that attendees can expect to acquire.

The deadline for submissions is **April 30, 2014**. *Early birds will receive acceptances after March 23rd*Abstract should be submitted electronically by visiting: http://www.societyforchaostheory.org/conf/2014

Guest Speakers for SCTPLS Conference in Milwaukee

David Schuldberg

Developing a "feel" for nonlinear systems: How to work with impossible problems

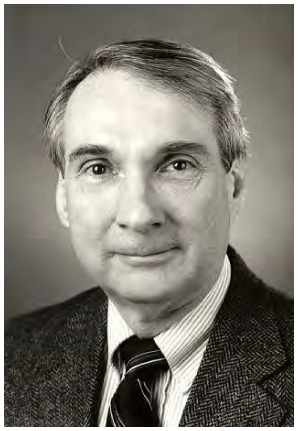
David Schuldberg

From coping with climate change to salvaging American health care our most pressing current problems involve complicated nonlinear inter-relationships and complex, often baffling behavior. We are called upon to recognize when "systemic causation" must replace old-school cause-and-effect. Planners must consider unintended consequences, tipping, normal accidents, and "ironic" or "revenge" effects. This presentation investigates methods and vocabularies for identifying systems-level health and pathology. It then describes emerging heuristic approaches, incremental solutions to intractable, seemingly impossible problems; it traces the art of improvisational repair across levels of complexity. It concludes with my hopes for a future where young people -- who grew up with intricate simulations like *Sim City* and *Kerbal Space Program*, as well as immersive and interactive virtual worlds -- will bring more sophisticated systems-level skills to the world's problems.

David Schuldberg, Ph.D., is Professor of Psychology at the University of Montana, Missoula, and has published extensively on nonlinear dynamics. He was born in Los Angeles, California and grew up in Seattle, Washington. After a B.A. in Social Relations from Harvard University in 1973 (including a brief period majoring in physics), he received his M.A. and then Ph.D. (in 1981) from the University of California, Berkeley, with a Postdoctoral Fellowship in Clinical Research in the Department of Psychiatry at Yale in 1988-89. Dr. Schuldberg joined the faculty of The University of Montana in 1984, now serving as the Director of Evaluation at the SAMHSA-funded National Native Children's Trauma Center at UM, and is a licensed clinical psychologist. A former Director of Clinical Training, he teaches undergraduate and graduate students and supervises both research and clinical work. Dr. Schuldberg is particularly interested in applications of nonlinear dynamics to positive human functioning, including creativity and psychological well-being. He is currently working on the definition and modeling of health processes – both psychological and physical – and on nonlinear facets of health care services and health care reform.

Julien Clinton Sprott

Lessons Learned from 19 Years of Chaos and Complexity



Julien Clinton Sprott

As we conclude the nineteenth year of the Chaos and Complex Systems Seminar, I would like to discuss some of the lessons I have learned from listening to over 500 talks, from my own research, and from the many books and articles I have read on the subject. This will be a rather personal and subjective talk and thus probably controversial. In particular, I will argue that the feedback, nonlinearities, and self-organization that characterize all real dynamical systems are more likely to ameliorate the dire consequences that others have predicted than to exacerbate them as so many fear. This is not a prediction that our problems will vanish or an argument for ignoring them. On the contrary, our choices and actions are the means by which society will reorganize to become even better in the decades to follow, albeit surely not a Utopia.

Julien Clinton Sprott, born September 16, 1942 in Memphis, Tennessee, received his B.S. in physics from the Massachusetts Institute of Technology in 1964 and his Ph.D. in physics from the University of Wisconsin in 1969. He worked at the Oak Ridge National Laboratory for several years before returning to the University of Wisconsin to join the physics faculty in 1973. In 2008, he became an Emeritus Professor of Physics. His research has been primarily in the area of experimental plasma physics and controlled nuclear fusion. In 1989 his interests turned to nonlinear dynamics, chaos, fractals, and complexity. He has authored or coauthored over 400 scientific papers in these and related fields.

Professor Sprott has written a number of books, including "Introduction to Modern Electronics", "Numerical Recipes and Examples in BASIC," "Strange Attractors: Creating Patterns in Chaos," "Chaos and Time-series Analysis," "Images of a Complex World: The Art and Poetry of Chaos," "Physics Demonstrations: A Sourcebook for Teachers of Physics," and "Elegant Chaos: Algebraically Simple Chaotic Flows." He has produced dozens of educational videos and has given his popular presentation of "The Wonders of Physics" over 200 times to a total audience of over 80,000. He has produced several commercial educational software programs, one of which won the first annual "Computers in Physics" award for innovative software in physics education. He received the John Glover Award from Dickinson College, the Van Hise Outreach Award for Excellence in Teaching from the University of Wisconsin-Madison, a Lifetime Achievement Award from the Wisconsin Association of Physics Teachers, and a Distinguished Service Award from the UW Physics Department for his work in public science education.

Pre-Conference Workshop 2014

The pre-conference workshop for this year is designed for researchers at any career stage who are ready to break into this fascinating area and expand their research agendas in the life and social sciences. The program is also ideal for graduate students who want to do new research with impact on their respective topic areas! Of further interest, a version of this program was very popular in the past with professors who were exploring the best means for importing nonlinear dynamics to their substantive theory or methods courses. Participants may register for either or both the AM and PM sessions.

AM SESSION

Segment 1: Basic premises of nonlinear systems: attractors, bifurcations chaos, fractals, self-organization, catastrophes, agent-based strategies. Presented by Stephen Guastello, Ph.D., Marquette University.

Segment 2: Chaos, fractals, and power laws, up close and personal. Presented by J. C. Sprott, University of Wisconsin, Madison

PM SESSION

Segment 3: Entropy, state space grids, and pattern extraction with symbolic dynamics. Presented by David Pincus, Chapman University, Orange, CA.

Segment 4: Formulating hypotheses with nonlinear dynamics. Presented by Keith Owen, Principle, Somerset Consulting Group, Austin TX, and A. Steven Dietz, Texas State University, San Marcos.

RECEPTION AND DISCUSSION

The day will conclude with a reception and open discussion on theory building concerns, methods questions, and research strategies. *All conferees* are invited to join us for this final session of the day.

About The Society

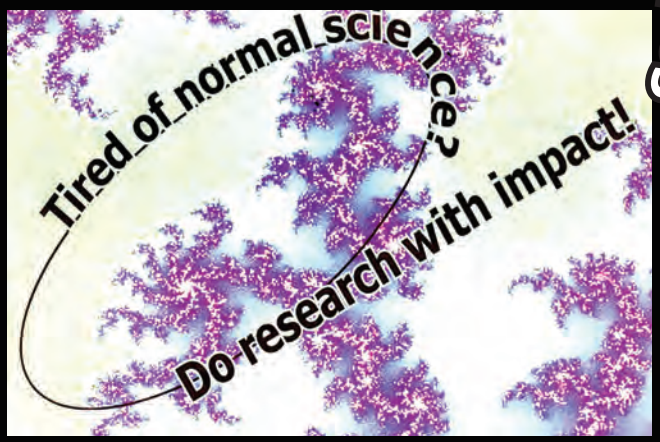
The Society is an international forum that brings together researchers, theoreticians, and practitioners interested in applying dynamical systems theory, self-organization, neural nets, fractals, cellular automata, agent-based modeling, and related forms of chaos, catastrophes, bifurcations, nonlinear dynamics, and complexity theories to psychology and the life sciences.

Our members hail from numerous specialties within psychology, other social sciences, and biology, physiology, neuroscience, mathematics, philosophy, physics, computer science, economics, education, management, political science, engineering, and the world of art. Our membership spans more than 30 countries.

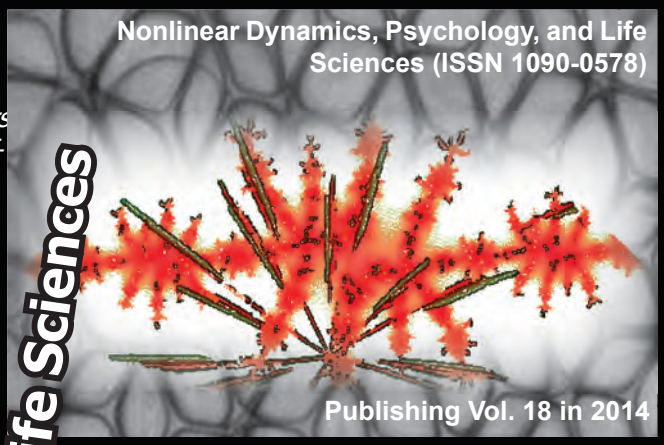
SCTPLS Annual Conference

The SCTPLS Annual International Conference offers a unique intellectual and social atmosphere that stimulates dialogue with symposia, roundtables, single papers, workshops, the business meeting, and prominent guests. Operating since 1991, it is the longest-running conference of its type. Presentations may be theoretical, applied, empirical, or methodological in content. *Program tracks* include: Biomedical sciences, Cognitive Psychology and Ergonomics, Clinical Psychology, Mathematics, Ecology, Sociology, Economics, Communication, Group Dynamics and Organizational Behavior, and Philosophy of Science. SCTPLS also sponsors the International Nonlinear Science Conferences.

www.societyforchaostheory.org



Society for Chaos Theory in Psychology & Life Sciences



Members receive a subscription to our quarterly refereed scholarly journal, which is abstracted in APA PsychInfo, Medline, JEL/Econlit, MathSciNet, Social Sciences Citation Index, Web of Science, and other important index services. Recent special issues include:

- **Nonlinear Organizational Dynamics**
- **Developmental Psychopathology**
- **Creative Behavior**
- **Medical Practice**
- **Psychomotor Coordination and Control**

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- access to software and tutorials on nonlinear science,
- an opportunity to positively affect the growth of the field.

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