

Society for Chaos Theory in Psychology & Life Sciences NEWSLETTER

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Matthijs Koopmans
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Editor
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The 17th Annual International SCTPLS Conference will be held at Chapman University in Orange, California July 27-29, 2007. With just over 5,000 students, Chapman is the largest private university in Orange County. The conference will provide an opportunity to stay abreast of the latest developments in Nonlinear Dynamical Systems science, and showcase the latest accomplishments of our members. If past conferences are indicators, a wide range of areas of application for nonlinear science in psychology and life sciences will be covered, ranging from biopsychology to organizational behavior, with everything in between. The conference also features workshops for all levels of scholarly entry, where our members hone their skills in nonlinear research techniques and practical application for nonlinear ideas, and two keynote presentations by leading scholars in the field. Please watch the Newsletter, and the SCTPLS website and listservers

CHAOS IN ORANGE

for the call for papers and announcements about our workshops and special guests this year.

Chapman University is located in the City of Orange, which is a classic college town, with 1950's style architecture and MANY antique shops (it is the antique capital of southern California). It is a favorite location for the Hollywood film industry. Nearby attractions include Disney Land (approximately 4 miles away); Southern California Beaches and beach communities including: Newport Beach (15 miles), Huntington Beach (18 miles), and Laguna Beach (21 miles); Los Angeles (many more beaches and attractions there obviously - 35 miles).



17th Annual International SCTPLS Conference
Orange, CA, July 27-29, 2007

President's Letter

These are exciting times for the nonlinear dynamical systems community. The annual SCTPLS conference in Baltimore was a great success with many excellent and several outstanding presentations; in addition, any of us remain nostalgic about the spring 2006 International Nonlinear Science Conference, which took place in Crete, Greece last spring. In conjunction, these two events provided a very extensive coverage of the most recent work in nonlinear dynamical systems research in the US and the rest of the world, demonstrating the vigor of our discipline. Our next annual meeting will take place in Orange, CA at Chapman University (July 27-29, 2007), and a call for papers will be published soon. There are also plans underway to organize a third International Nonlinear Science Conference in early 2008. We will keep you posted on these developments.

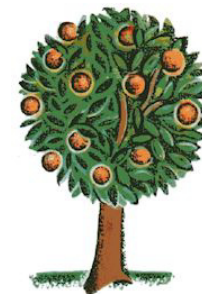
A few other things are worth mentioning. The Constitutional Review Committee completed its work this spring, and the motions, included in their report (see July Newsletter) were presented at the business meeting by committee chair Bill Sulis. All motions passed, and former SCTPLS Secretary Mary Ann Metzger has kindly offered to edit the Articles of Organization accordingly. One would expect that this work take us a significant step toward making our Society a more sustainable long-term entity.

Other committees have also been very active furthering our cause. The member-

ship committee, chaired by Sara Ross, spent a significant amount of time doing virtual outreach work and at just over 300, our membership numbers are the highest they have been in more than a decade. The education committee, chaired by Jayne Fleener, took the lead in putting together an extensive list of resources on the Society's website for faculty and students with an interest in nonlinear dynamical systems, including video-taped lectures on nonlinear dynamics as well as primers on chaos, fractals and other fundamental NDS concepts. A glossary of NDS terms is in preparation and will be added soon.

After having served for ten years as Editor in Chief of our flagship journal Nonlinear Dynamics in Psychology and Life Sciences, Stephen Guastello's term has expired, and there was some discussion at the business meeting about where to take things from here. By any standard, Steve has done an excellent job as editor, and we are glad to report that he has indicated a willingness to serve another term if asked. He has also agreed to serve for one additional year in the interim, while the Society's Publications Committee will develop a set of recommendations about how to proceed with the appointment process.

In the spirit of full disclosure, the reports presented at the business meeting this summer (except for the CRC report published this July) can all be found in this Newsletter. Happy reading and see you in Orange next summer.



CHAPMAN UNIVERSITY

Temporal Observer Perspectives

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Abstract: Simultaneity is generated by nesting temporally compatible events, with every embedding performance adding a new level of description. Reiterated nestings generate a fractal temporal perspective. This perspective may be described by my Theory of Fractal Time which differentiates between Δt_{depth} , Δt_{length} , and $\Delta t_{\text{density}}$ in terms of temporal compatibility. Simultaneous incompatible reference frames result in disorientation which may be described as a temporal pathological state: Incompatible simultaneity splits up the temporal observer-world interface by forcing it to host two (or more) incommensurable temporal perspectives. The creation of mutual observer frames may serve as a remedy.

Keywords: simultaneity and succession, compatibility, fractal time, temporal fractal interfaces, temporal pathological states

Introduction: Spatial and Temporal Perspectives

The notion of perspective entails the idea of an observer generating depth. An impression of spatial depth may be created by representing objects located at different distances from the observer as being of different sizes. This difference in extension creates a reference frame, in which objects located at the same distance from the observer position have the same relative size. Perspective presupposes simultaneity of nested subsets, e.g. subsets of objects at different distances from the observer position. If we saw the individual objects of varying subsets successively, no perspective would arise for the lack of depth generated by nested subsets (Vrobel 1999).

The same is true for temporal perspectives. If time were “just one damn thing after another” (Powers, 2004), we would not be able to create temporal depth and thus a temporal perspective. Only by nesting intervals of different lengths which extend from the observer’s Now into the past and the future are we able to create a temporal reference frame.

Such reference frames and the objects which define them may be logically consistent, as in paintings constructed in a central perspective. We are usually not aware of the underlying reference frame creating this perspective when we navigate through the world. It is a prerequisite for cognition we only become aware of if our expectations are not met. This happens, for example, if we are exposed to a painting

which hosts two incompatible perspectives. Hans Holbein’s painting *The Ambassadors* (Figure 1) contains an anamorphosis, (a distorted perspective) which the observer can make sense of only if he takes an observer perspective which deviates significantly from the normal observer standpoint in front of the painting, usually in a position giving a central perspective. By moving to the left and ducking, he will create a new perspective which reveals an anamorphosis in the shape of a memento mori (Lat. for “remember that you are mortal”),

**For the eye altering
alters all.**
William Blake: *The Mental
Traveller* 1800-10



Figure 1: *The Ambassadors*
by Hans Holbein (1533)

a highly distorted skull which Holbein inserted into the painting (Figure 2). This play on perspective was popular at the time, questioning the reality and truth of our sensual (visual) perceptions.

The two perspectives cannot be disentangled by the observer, unless he introduces an additional degree of freedom into his reference frame, i.e. by adding a level of description (LOD) by “taking a step back” and realizing that he may change his observer position. Once the observer has seen the painting from both perspectives, he is able to make out the skull even if he looks at the painting from a central perspective. The awareness of a distorted subset within the painting has changed the structure of his world-observer interface. This interface has adopted the second, incompatible perspective. If this observer were subjected to a similarly distorted subset again, he may recognize it as a result of his previous exposure to an incompatible perspective (Vrobel 2006a).

The same principle of an observer adding a new LOD and thus differentiating his observer-world interface can be applied to temporal perspectives. The Risset scale may serve as an auditory analogy (Tscheinkel and Musil 2006). The Risset scale is a periodic signal of an ascending tone which is played simultaneously on various scales (there are also descending and dichotic versions of this scale). It prompts the auditory illusion of an ever-ascending tone because the listener focusses only on pitch relations (frequency) and thus tries to extract a one-dimensional signal from a multi-layered one.

The multi-layered signal creates depth and thus a perspective. It may be disentangled by the listener if he can add an additional degree of freedom, thus creating a choice: He may either focus on the periodic signal or follow the pitch (Test subjects are able to unlearn to fall for the auditory illusion if they are made aware of the periodic character of the signal (Vrobel



Figure 2: The “normalized” distorted skull (artborder.com 2006)

2006b)). Being able to decide whether or not to fall for a visual illusion such as an anamorphosis or an auditory distortion modifies the observer’s interfacial structure. Having disentangled one example of a visual or auditory distortion, he is able to anticipate distortions in future exposures to such ambivalent stimuli.

It is important to recall that any perspective, be it spatial or temporal, requires a framework consisting of nested intervals of varying extensions. Incompatible perspectives require a further differentiation, i.e. that of a logically consistent framework nested inside an embedding one which follows a different logic.

Perspectives change with the number of embeddings performed by the observer. Nesting and de-nesting performances generate the structure of our temporal fractal interface, our Now (Vrobel 2000). If the Now hosts embeddings in the form of nestings of simultaneous intervals which create the temporal observer perspective, it must be assumed to have extension and a fractal structure.

Fractal Time

The Now’s fractality is the result of reiterated nestings, which generate a fractal temporal perspective (Vrobel 2005a). My Theory of Fractal Time (Vrobel 1998) differentiates between Δt_{length} , Δt_{depth} , and $\Delta t_{\text{density}}$, which allow us to describe such nested temporal perspectives. Δt_{length} , the length of time, measures the succession of events on one LOD. It is the number of incompatible temporal extensions in a time series. Δt_{depth} , the depth of time, measures simultaneity and provides the framework time which allows us to structure events in Δt_{length} . It is the number of compatible temporal extensions in a time series. $\Delta t_{\text{density}}$ is the temporal density of a time series, the fractal dimension of time. Δt_{depth} logically precedes Δt_{length} , as there is no succession without simultaneity. (Successive, i.e. incompatible, events have to be arranged on one LOD. This LOD, however, must first be defined in terms of Δt_{depth} .)

The mathematical continuum onto which the metrics of Newtonian time are projected may be defined as a special case of fractal time, i.e. as the set of successive intervals measured on one LOD (in units of Δt_{length}), on nesting level ∞ , with $\Delta t_{\text{depth}} = \infty$.

Any multi-layered signal may serve as an example for such a fractal time series. To illustrate the idea, consider the frequency ratios of musical notes which are played simultaneously. The least complex frequency ratio between two musical notes is 2:1, which defines the interval between them as an octave. The note A played on an oboe, for example, has a frequency of 440 Hz. The next higher A played on this musical instrument would have a frequency of 880 Hz, and so on. The nested overtones generate a cascade of embeddings, whose structures are translatable into each other, as the overtones are integer multiples of the fundamental frequency (Vrobel 2006a).

Translatability is possible if the pattern displays a self-similar structure, i.e. if the embedded LODs host

structures which are identical to those of the embedding LODs, albeit of different extension in Δt_{length} . The resulting commensurability gives rise to our notion of consonance:

“The idea of consonance is ultimately grounded in the notion of commensurability, an essential in Greek mathematics. We recognise consonance when we perceive a certain number of vibrations of one frequency exactly matching a certain number of another frequency.” (Fauvel et al 2003).

In the musical example of nested overtones, consonance is created by overlapping frequencies which are easily translatable into each other in terms of Δt_{length} and Δt_{depth} .

In order to define a temporal observer perspective, the notions of Δt_{depth} and Δt_{length} suffice (Vrobel 2005b). $\Delta t_{\text{density}}$ is implicit in the idea of a temporal perspective, as it describes the relation between the number of nestings and the successive events on their respective LODs. These two temporal dimensions (Δt_{depth} and Δt_{length}) must be assumed in order to explain our perception of a multi-layered signal such as the Risset scale (Vrobel 2005b). Sometimes, it is possible for the observer to disentangle such signals; at other times, he is not in a position to do so. The latter may result in a temporal pathological state. (In the case of the Risset scale example, nothing worse would happen than the listener falling for an auditory illusion.)

Temporal Pathological States: Incommensurable Temporal Perspectives Split up the Observer-World Interface

An observer may be stuck with a temporal perspective. This happens if he is not in a position to analyze his perspective by identifying the underlying LODs, i.e. if he cannot determine Δt_{depth} . As a result, this observer cannot modify his rigid perspective by adding or removing LODs by means of embedding or disembedding performances – Δt_{depth} remains constant. This would make it impossible for him to reflect on his perspective – a particularly troublesome constraint if it results in the observer being unhappy and at the mercy of his acquired unmodifiable perspective. An example of a situation resulting from such a rigid perspective is double bind or N-Bind (Varela 1979) relations. A double bind is a behavioural pattern in which a speaker sends out incommensurable verbal and/or nonverbal messages to another speaker, who is emotionally dependent on the former. Prolonged exposure to such conflicting messages may split up the observer-world interface by forcing it to host incommensurable temporal perspectives, thus generating a temporal pathological state.

Incompatible perspectives may be resolved by embedding the prevailing perspective into new LODs, i.e. by generating Δt_{depth} . This, in turn, leads to a change of perspective. Koopmans describes three self-regulatory scenarios which may result from stress on a family system (Koopmans 2001). Either a double bind relation emerges, or the relations within the family are readjusted. This may happen as the result of

creating greater variability in interaction patterns or in a second order change, where the system jumps onto a new attractor. In terms of fractal temporal dimensions, this means that such readjustment scenarios have created a different relation between the nested LODs making up the observer perspective – the scaling factor in Δt_{depth} may have been modified and some LODs may have been removed and/or been replaced by others. The creation of a new observer frame may result, with a perspective comprising new contexts (new LODs). If second order change cannot be implemented because no disentangling (no meta analysis) is possible, e.g. because the relationship corresponding to the fixed reference frame is vital (a child emotionally depending on his mother’s affection), it is conceivable to embed the existing entangled and contradictory perspective into a non-contradictory one. This non-contradictory perspective would generate a counterbalance which may eventually enable the trapped observer to perform a meta analysis and rid himself of the incompatible perspectives which structure his temporal interface.

This acquired rigid perspective is a phenomenon not limited to pathological cases in the clinical sense. Educated incapacity is another example of being stuck with a fractal temporal interface whose Δt_{depth} is not adapted to new contexts by intersubjective exchange: If the only tool you have is a hammer, everything looks like a nail. And the resulting temporal perspective forces an observer at the mercy of his rigid temporal interface to align all incompatible events on the LODs available, i.e. in the temporal dimension of Δt_{length} , as he cannot embed his acquired perspective into new contexts and generate Δt_{depth} .

A promising recipe for dissolving incompatible perspectives is to embed them in a non-contradictory framework by nesting the existing perspectives into an additional LOD, i.e. “taking a step back”. In terms of Hofstadter’s tangled hierarchies, it is the inviolate level which we should seek in order to rid ourselves of incompatible temporal perspectives. According to Hofstadter, below every tangled hierarchy which may be produced by multi-leveled systems lies an inviolate level which cannot be altered from within the LODs it embeds (Hofstadter 1980, Vrobel 2002). The inviolate level disentangles all structures which seem ambiguous from the perspective of an observer within the system (e.g. an observer in an N-Bind relation).

Creating Mutual Observer Frames

Adding a degree of freedom in the form of an independent additional LOD (preferably an inviolate level), into which an existing perspective may be embedded, renders possible a reflection on the embedded system – the first step to resolving pathological relationships which are sustained by the rigid observer perspective.

In order to disentangle fixed observer frames, it is necessary to intersubjectively identify incompatible temporal perspectives within one observer frame and embed the ambiguous perspective into an indepen-

dent LOD, preferably an inviolate level. This may be done by identifying and analyzing the LODs which form the observer's perspective in terms of Δt_{depth} and Δt_{length} . The acquired perspective may then be modified by adding or removing LODs, i.e. by learning and unlearning behavioural patterns against the background of the newly acquired context, i.e. the LOD embedding the temporal pathological perspective.

Not every entangled perspective can be resolved. In such cases, nesting the pathological perspective into an independent healthy one may provide enough counterbalance for the affected individual to lead a fairly healthy life. Mutual observer frames may provide such a counterbalance. A shared perspective generated through intersubjective exchange with individuals or groups with a non-contradictory observer frame may do the trick. If there is enough mutual information, the entire attractor representing a healthy non-contradictory observer frame may be reconstructed and adopted, even if the pathological perspective is sustained at the time of embedding.

Temporal observer frames are defined by their arrangement of simultaneous and successive events (Δt_{depth} and Δt_{length}). Taking seriously the idea of simultaneity and succession generating our fractal temporal perspective has the following implication: What may be simultaneous to one observer (extending in the dimension of Δt_{depth}) may be successive for another (extending in the dimension of Δt_{length}).

Taking a step back means contextualizing an existing perspective by embedding it into a new one. We do this all the time when we learn and un-learn behavioural patterns. Thus, a healthy adaptive perspective is always in flux. Rigidity should be avoided in order to prevent the generation of pathological perspectives.

If the ability to reflect on one's perspective is compromised (e.g. in an N-Bind relation), contextualization must be induced from the outside. Professional help as is offered by therapists is usually sought when the damage has already been done. Preventive measures could be offered on, say, a monthly "contextualization day", a day off work on which individuals are embedded into an environment which is as independent as possible of the one determining their everyday reference frames and perspectives (a candidate for an inviolate level).

Mutual observer frames may be generated by intersubjectively defining the nested LODs which make up our temporal fractal perspectives. This process always starts with the realization that our observer frames are made up of LODs which we relate to each other by embedding them into a nesting cascade, thus creating the temporal dimension of Δt_{depth} . The initial wish to question the structure of our observer frames is usually prompted by an encounter with incompatible simultaneous perspectives within these observer frames, such as tangled hierarchies and ambiguities which may manifest themselves as educated incapacity or a temporal pathological perspective (e.g. N-Binds).

Therefore, it would be a good idea to look out for incompatible perspectives, tangled hierarchies, ambiguities and misunderstandings. They are valuable clues to the existence of underlying correction processes whose existence we would otherwise not even suspect. These correction processes, in turn, point to the nested structure of our temporal fractal perspective which constitutes our observer frames. Awareness of this structure allows us to modify it through nesting and de-nesting performances and thus enable us to alter Δt_{depth} , which shapes our temporal perspective.

Conclusion

In order to describe our perceptions of multi-layered signals, time must be assumed to extend in the dimensions of Δt_{depth} and Δt_{length} . Our temporal perspective is generated by embedding performances which result in a fractal structure. Not all temporal perspectives are unambiguous. Observer frames which host incommensurable temporal perspectives which are superimposed on the observer-world interface (as a result of being perceived as simultaneous by the observer) may result in a temporal pathological state.

Intersubjectively defined common LODs and nestings thereof generate mutual observer frames, which are a prerequisite for ridding ourselves of educated incapacity and pathological relationships such as N-Bind relations. My Theory of Fractal Time is an attempt to provide a model by means of which the observer's internal differentiation may be described. An observer who is aware of his fractal temporal perspective is in a position to question the nestings this perspective is based on and, in the wake of this awareness, modify the constraints which shape his reference frame.

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SCTPLS Business Meeting Minutes

Submitted by David Pincus, Secretary

Baltimore, MD, August, 2006

President Koopmans opened the meeting and made introductory remarks.

1) Conferences:

The Baltimore conference was discussed. Positive aspects of the conference were mentioned, and the conference overall was characterized as excellent. Constructive criticism and areas for future attention included: scheduling options in response to cancellations, improving diversity with respect to attendee age (i.e., more early career and student participation), conference activities, scheduling of business meeting and other whole-group events, technology and physical aspects, volunteerism, increasing interdisciplinary content.

Options for next year's conference were discussed including the following locations: Seattle WA, Salt Lake City UT, Orange CA, and Vancouver BC. In addition, the possibility of linking the timing and location to other relevant conferences (i.e., systems conference). The Executive Committee will explore the possible options and select the optimal location.

The second International Nonlinear Science Conference (INSC) held in Crete, March 2006 was discussed. It was generally characterized as an outstanding conference in a number of respects. Many thanks were extended to the chair of the conference planning committee, Ivelisse Lazzarini, and other committee members. The EC's plan is to poll the membership for possible locations for the next INSC, tentatively to be held in March '08. Nicholas Harkiolakis suggested that he would be willing to sponsor an event in Athens, Greece.

2) Committees:

Nominations and Elections: No report submitted. Ivelisse Lazzarini was nominated to run for the presidency of SCTPLS, following the end of President Koopmans's term. After some discussion, J. Barkley Rosser agreed to appear on the ballot as a second candidate.

Treasurer – See report below.

Membership – See report below. Congratulations and gratitude was extended toward the Chair, Sara Ross.

Motion: Membership committee will continue for another year, passed unanimously.

Public Relations – See report below. A suggestion from the floor was made that the chair of PR, Joseph Jacobsen, should contact the compendium of complexity centers for inclusion of SCTPLS in their directory.

Constitutional Review – Bill Sulis read the report (see below). The report was discussed. Motions within the report were subject to a single vote, based on a motion from the floor, with a motion-by-motion vote to follow if necessary.

Motions: were passed with 14 "yea," 1 "nay," and 0 abstentions.

Mary Ann Metzger volunteered to make the actual edits to the language of the Articles of Organization. This motion passed with a unanimous vote.

3) Editorship of the Academic Journal of the Society, Nonlinear Dynamics and Life Sciences (NLD-

PLS):

President Koopmans made comments on the excellence of the journal's performance and the performance of Stephen Guastello, Editor in Chief, over the past 10 years. The length of term for the next editor and procedures for selecting the next editor were outlined as agenda items. Stephen Guastello was asked if he would be interested in continuing to serve as editor and he indicated that he would.

Motion: from the floor that Stephen Guastello continue in the position of editor for another year as a procedure is developed for timing and selection was made. Motion was passed with a unanimous vote.

Motion: from the floor that the publication committee will recommend to the Executive Committee a process for selecting the next editor and the length of term. Motion was passed with a unanimous vote.

4) New Business:

Bob Porter suggested a resolution (not a motion) pertaining to the role of the newsletter editor. If passed, Bob Porter suggested that the resolution should go to the Executive Committee as a resolution with the support of the membership to be detailed and carried out by the EC. The resolution was discussed.

Motion: from the floor to vote on the resolution. The resolution was declined, with 2 "yea," 5 "nay," and 2 abstentions.

Membership Committee Report

In September 2005, President Matthijs Koopmans published an ad that announced the Membership Committee's charge and invited Society's members to volunteer. Ivelisse Lazzarini, who had served on the Committee previously, volunteered to continue to serve.

The Society's historical membership record high was 310, set in August 2003. Two years later, the Society had 294 members, in August 20, 2005. In April 2006, the 2003 record was exceeded, and as of July 10, 2006, membership stood at 339.

1. Assist in the ongoing search for new members

- a. Approximately 600 email addresses harvested from the website visitors records have been "cleaned and tested" and added to the Society's big mailing list.
- b. 250 snail mail invitation-to-join letters (with the Society's brochure enclosed) have been sent to a combination of domestic (the majority) and international addressees.

2. Assist the Society with the sending out of membership-related mailings (e-mail and s-mail)

One step in the aforementioned process of testing email addresses involves sending meaningful email announcements to them, e.g., conference and journal announce-

ments. A limited number of additional web-searched email addresses received the same treatment. Approximately 625 solicitation e-mail addresses have received from one to two such mailings.

With respect to the next three charges itemize below:

- a. Later in 2006, the Committee will address these charges and develop an integrated strategy for them.
- b. As an early, and thus far unproductive, effort to research the factors that have attracted members to the Society, I submitted an article to the April 2006 Society Newsletter, entitled Stories, Sparks, and Explanatory Power: Report from the Membership Committee. It solicited input from members, via either the new ChaoForum list or by email. I dropped the ball on initiating a post to the new forum to attempt to catalyze input from however many members subscribed to that list. There are no results to report.

3. Help us develop specific recruitment strategies to strengthen membership in the following population categories: (1) undergraduate and graduate students and (2) established nonlinear scholars who are not members of our society and (3) any other potential group that you think may have interested individuals (e.g., practitioners)

4. Develop strategies to retain lapsing members and provide recommendations for improvement of SCTPLS membership services

5. Forge links with like-minded organizations to explore mutual membership development potentials.

6. Administer the student scholarship fund for the annual conference

The very low volume of applications this year (two) were more efficient to handle directly by Executive Committee officers.

Treasurer's Report

This report summarizes the financial results for the Society for the fiscal year ending 31 March, 2006. The final net for this year was \$6546 after encumbrances. SCTPLS has been running at a modest surplus consistently since June 1994. The following sections of this report provide the financial details of the Society's operations and the status of special funds.

Details of Operations

The three main areas of financial operation were the annual conference in Denver (Line A, Table 1), the INSC conference (Line C), and the membership-journal activities (Line D). A positive net was recorded for all three areas. The total attendance at the conference in Denver in August 2005 was 59. The total attendance at the INSC conference in Heraklion, Crete, Greece was 89. The total attendance at the Baltimore 2006

was 96; an early deposit is shown in Line B, and the registration fees received before April 1, 2006 are shown in Line J.

Line D represents the core nexus of membership activities. It contains receipts from membership fees, institutional subscriptions to NDPLS, individual book sales, less expenses to produce the journal and Newsletter, produce the annual art poster, purchase books, and related expenses for Public Relations and other membership operations. Our membership currently stands at 357 active members as of August 8, 2006. This number represents an improvement over the high water mark of 310 that was set in August 2003. The improvement is attributable to the INSC conference, which brought in 63 new members; we look forward to their membership renewals this fall. Memberships from renewals and other sources stand at 294, which is the same number as last year. The institutional subscription level 2006 now stands equal to that of 2005, or 32 subscriptions. Institutional prices for 2006 will reflect a small increase to keep pace with inflation.

Line F: This amount was used to promote NDPLS at several librarians' conferences throughout the year. This form of advertising has been discontinued in 2006. The Executive Committee has embarked on a print advertising campaign for 2006 that would publicize the Society and NDPLS in publications of the Association for Psychological Science and American Psychological Association.

Line L: Any expansion of present or new services would require additional help. This allocation is earmarked for work study students who can perform many needed tasks and thereby free up professional time for planning activities.

Special Funds

Line E: The Society established two special funds in April 2004. The Student Scholarship Fund provides for waivers of conference registration fees for student members who have a technical presentation accepted for the annual conference. The International Hardship Fund provides for reductions in conference registration fees for members who have a technical presentation accepted for the annual conference and who have made a reasonable claim for hardship; travel from a currency-impaired country is the primary example of hardship addressed by the fund program. Other than the qualifications described above, applicants are given awards on a first-come first-served basis to the extent that resources allow.

The two funds were seeded by contributions from members and by the Society's own resources. Disbursements are reflected as a lessened amount in Line A. A total of \$770 was distributed in this fashion in FY 2005. Details of amounts for the two funds are given in Table 2.

Project	Net Income
A. 2005 Conference in Denver	\$4738
B. Deposit on 2006 Conference in Baltimore	(25)
C. INSC conference in Crete	5928
D. Membership fees, institutional subscriptions, individual book sales, less expenses	2117
E. Donations to special funds	365
F. Advertising	(304)
G. Interest on accounts	1952
H. General finance and accounting office	(2000)
Net before encumbrances	\$12,771
I. Donations to special funds (same as E)	(365)
J. Membership fees for 2006-07 and later years received before April 1, 2006	(3850)
K. Conference registration fees received before April 1, 2006	(1210)
L. Start-up cost for new membership service project	(800)
Final net	\$6546

Table1. Financial results for FY 2005

Student Scholarship Fund	Amount
Starting Amount, 1 April, 2005	\$725
Donations received	245
Awards made	(600)
Fund balance	370
International Hardship Fund	
Starting amount, 1 April, 2005	245
Donations received	120
Awards made	(170)
Fund balance	195

Table 2. Status of special funds for FY 2005

Indebtedness

SCTPLS has no outstanding debts in the form of bank or other loans, bonds, or accounts payable in excess of 60 days.

*Submitted by Stephen Guastello, Ph.D.
Treasurer and CFO for SCTPLS*

Publications Committee Report

The Publications Committee's purview includes four project areas: Nonlinear Dynamics, Psychology, and Life Sciences, the SCTPLS Newsletter, the SCTPLS web site, and other new publication ideas that should arise, e.g. books. The report lists new developments in each area for this year. The committee members are Koen DePryck, Terrill Frantz, Stephen Guastello (chair), Matthijs Koopmans (President), and Tim Haslett.

NDPLS. The journal produced two special issues on Nonlinear Methodology in October 2005 and April 2006. Robert Gregson was the guest co-editor for both of those issues. A special issue is scheduled for January 2007 on the topic of paradigms in science. The contributions for this issue will address issues such as, "Have nonlinear dynamics and the complexity sciences attained the status of a paradigm? What constitutes a paradigm shift in the various disciplines of the modern sciences? Is there a common strand that connects complexity science research, reflecting an underlying paradigm shift in scientific inquiry?" Jayne Fleener is the guest co-editor for the issue on paradigms.

The 2005 citation report was published in the January 2006 issue of the SCTPLS Newsletter. NDPLS articles that were published 1999-2003 collected an average of 1.90 citations per article over the 5-year period 2000-2004; this is the Impact Factor. We have recently determined that our new impact factor for 2006 (articles published 2000-2004 and cited in 2001-2005) is 2.01. These citations were counted from journals that are included in the ISI social science data base, and citations within NDPLS to other NDPLS articles.

Newsletter. Koen DePryck is the new editor of the Newsletter this year. His handiwork brought some new and attractive layout ideas. Matt Koopmans reiterated the Newsletter editorial policy in the January issue: "The NL is primarily intended to allow the Society to communicate with the membership about Society business, announce conferences, publish calls for papers, book reviews, and to celebrate our accomplishments in the field ... [T]he Executive Committee ... is ultimately responsible to its members for the NL content. The EC therefore has the right to insist that certain pieces that printed."

Web Site. The new development this year was that the Tutorials page was reorganized as "Chaos and Complexity Resources for Students and Teachers," and contains new narratives and annotated menus of tutorials, reading lists, and related resources. These innovations were developed in conjunction with the Education Committee (Jayne Fleener, Chair). The next scheduled developments are to aggregate software information and develop a glossary.

The SCTPLS web site hosted the 15th Annual International SCTPLS conference and the 2nd International Nonlinear Science Conference.

Books and other media. No firm proposals have been presented to the Publications Committee.

Submitted by Stephen J. Guastello, Ph.D., Chair

Public Relations Committee Report

The following items took place in somewhat chronological order:

E-mail list

After knowing where the conference is being held, universities, research facilities, government agencies and consultants who may have an interest nonlinear dynamics in economics, psychology, sociology, organizations, mathematics, neuroscience, education, environmental studies, decision, innovation, creativity or other life sciences are assembled from about a 200 mile vicinity. An e-mail list of 200+ were

Media Kits:

Media Kits were prepared with the following items:

- Double pocket folder
- First page with large font size FOR EMEDIATE RELEASE
- Opposite page is a letter from the president explaining who we are and the urgency of passing the information to their constituents, colleagues or subscribers
- New poster
- Latest newsletter
- Tsunami article
- List of publications by members (after 1995)
- Copy of our homepage
- Copy of the conference homepage
- Tri fold membership flyer

Media Outlets:

In an attempt to gain FREE publicity, media kits were sent to the following outlets:

- Scientific World
- Discover Magazine
- Psychology Today
- The Washington Times
- Baltimore Sun Times
- Baltimore Messenger
- The Baltimore Guide
- Baltimore City Newspaper
- Baltimore Magazine
- Howard University News
- The George Washington Hatchet
- The Common Denominator
- Georgetown University Voice
- National Science Foundation

- American University Eagle
- The Washington Examiner
- The Georgetown Independent
- WAMU
- American University Radio
- Capital Gazette
- Popular Science
- *Others I failed to document – too much in a hurry to get it out in time*

Posting posters, abstracts and schedules:

Out members were requested to post the 2006 conference poster along with the schedule through our listserve. No follow-up was made to determine how many members actually posted the materials. The materials were pdf file attachments. About 20 hard copy posters and schedules were sent out to department heads at various universities with the same request to post the materials on an appropriate bulletin board.

Web calendars:

Posting the conference to Web calendars is an effective way to keep our name out there over a long period of time. This appears to be one of the best ways

to publicize our events because it allows users to view the contents of the event at their leisure and when they want to rather than when we release the press kit.

- Public Radio
- Alpha Galileo (1500 email dispatches and a spot on their calendar)
- Newspapers
- City Guides
- Television Stations
- Universities

Future Plans:

When we know where the conference is located, I'd like to make personal phone calls to public radio stations and university radio stations to sell the idea of a live interview.

Submitted August 21, 2006
Joseph J. Jacobsen
PR Officer

Nonlinear Dynamical Bookshelf

Compiled by Stephen Guastello

In our well-established tradition of inconsistent reporting, we have once again compiled some information about chaos and complexity topics that succeeded in crawling into our hands. Enjoy!

Ausloos, M., & Dirickx, M. (2006). The logistic map and the route to chaos. New York: Springer-Verlag. ISBN 3-540-28366-8.

Baglio, S., & Bulsara, A. (Eds.). (2006). Device applications of nonlinear dynamics. New York: Springer-Verlag. ISBN 3-540-33877-2.

Braha, D., Manai, A. A., & Bar-Yam, Y. (Eds.) (2006). Complex engineered systems: Science meets technology. New York: Springer-Verlag. ISBN 3-540-32831-9.

Computational Statistics (2006, vol. 21, part 2) published a special issue on interval data analysis. *It introduces new methods, also touching on clustering, and reviews linear and nonlinear dynamics approaches. I see that k-means algorithms, and Hausdorff distances, get a mention. – RAMG.*

Ellner, S. P., & Guckenheimer, J. (2006). Dynamic models in biology. Princeton, NJ: Princeton University Press. ISBN 0-691-12589-9. 352p.

From controlling disease outbreaks to predicting heart attacks, dynamic models are increasing our understanding of biological processes. Many universities are starting undergraduate programs in biology to introduce students to this rapidly growing field. This book is specifically written for undergraduate students in the biological sciences. Authors teach students how to understand and build models in biology. – Publisher.

Evans, V. (2004). The structure of time: Language, meaning and temporal cognition. Philadelphia: Benjamins.

The book represents an examination of the nature of temporal cognition, with two foci: (1) an investigation into (preconceptual) temporal experience, and (2) an analysis of temporal structure at the conceptual level, which derives from temporal experience. – Publisher.

Gregson, R. A. M. (2006). Informative psychometric filters. Canberra: Australian National University Press. ISBN 1-920942-65-3. 310p.

This book is a series of case studies with a common theme. Comparisons are drawn using various sorts of psychological and psychophysiological data that characteristically are particularly nonlinear, non-sta-

tionary, far from equilibrium and even chaotic, exhibiting abrupt transitions that are both reversible and irreversible, and failing to meet metric properties. A core idea is that both the human organism and the data analysis procedures used are filters, that may variously preserve, transform, distort, or even destroy information of significance. – Publisher.

Guastello, S. J. (2006). Human factors engineering and ergonomics: A systems approach. Mahwah, NJ: Lawrence Erlbaum Associates. ISBN 0-805805006-6. 302p.

The field of human factors and ergonomics has changed markedly in the past decade. The widespread influence of computer technology has permeated every aspect of the human machine system. The systems are becoming more complex, so it stands to reason that new theories are needed to cope with the new sources of complexity. This textbook, which is intended for upper-level undergraduate and graduate students, addresses a wide range of hf/e principles found in conventional and 21st century technologies and environments, emphasizing concepts and systems thinking and how the allocation of function between the human and the machine has changed as a result of such technological advances. Topics include: conventional machines and workspace design, artificial life, environmental design, work in outer space, stress and work performance, and accident analysis and prevention. Applications of nonlinear dynamics show up frequently throughout the text. – Publisher.

International Journal of Bifurcation and Chaos, June-July, 2006 (vol. 16, nos. 6 and 7)

is running part one of a symposium on complexity. There are over 40 edited papers in it, many of explicit relevance to the Life Sciences. For those who are math phobic but still attracted to complexity science, the lengthy editorial (pages 1609-1612) gives a valuable overview of the various ways in which complexity manifests itself, and what in a good technical sense the word can mean. There are too many papers for me to single out to commend; one on imaging for MEG, CAT, PET and SPECT in brain scanning is important. Bifurcations in a Predator-Prey model should induce a rethink of some zoology. Stock market data turns up again. Other topics include therapeutic brain stimulation and methods from nonlinear dynamics, control of epileptic seizures, clustering, coupled oscillators, and entropy analyses of heart rate variability. It would be a brave member of SCTPLS who tried to review all this lot, but I think many of these papers do match up with particular topics that we have explored in NDPLS.

– RAMG.

Kaneko, K. (2006). Life: An introduction to complex biology. New York: Springer-Verlag. ISBN 3-540-32666-9.

What is life? Has molecular biology given us a satisfactory answer to this question? And if not, why, and how to carry on from there? This book examines life not from the reductionist point of view, but rather asks the question: what are the university properties of living systems and how can one construct from there a phenomenological theory of life that leads naturally to complex processes such as reproductive cellular systems, evolution and differentiation? The presentation has been deliberately kept fairly non-technical so as to address a broad spectrum of students and researchers from the natural sciences and informatics. – Publisher.

Kelso, J. A., & Engstrom, D. A. (2006). Complementary nature. Cambridge, MA: MIT Press. ISBN 0-262-11291-4. 400p.

Why do we divide our world into contraries? Why do we perceive and interpret so many of life's contraries as mutually exclusive, either/or dichotomies such as individual~collective, self~other, body~mind, nature~nurture, cooperation~competition? Throughout history many have recognized that truth may well lie in between such polar opposites. The authors contend that ubiquitous contraries are complementary and propose a comprehensive empirically based scientific theory of how the polarized world and the world in between can be reconciled. They nominate the tilde (~) as the symbolic punctuation for reconciled complementary pairs. – Publisher.

Kerner, B. S. (2004). The physics of traffic. New York: Springer-Verlag. ISBN 3-540-20716. 682p.

This book is devoted to the explanation of freeway traffic congestion, a fact of life for many car drivers. Results of empirical observations of freeway congestion, which exhibit diverse complex spatio-temporal patterns including moving traffic jams, are analyzed. Empirical features of these reproducible freeway traffic patterns only recently sufficiently well understood are reviewed. In the first part, three-phase traffic theory can be found, which is the basis for a physical theory of traffic phenomena and its applications in engineering. In the second part, the empirical spatio-temporal patterns are examined and, finally in parts III and IV, the mathematical model and the engineering applications are addressed. – Publisher.

Kocarev, K., & Vattay, G. (2005). Complex dynamics in

community networks. New York: Springer-Verlag. ISBN 3-540-24305-4.

McDaniel, R. R. Jr., & Driebe, D. J. (Eds.) (2005). Uncertainty and surprise in complex systems. New York: Springer-Verlag. ISBN 3-540-23773-9. 200p.

Complexity science has been a source of new insight in physical and social systems and has demonstrated that unpredictability and surprise are fundamental aspects of the world around us. This book is the outcome of a discussion meeting of leading scholars and critical thinkers with expertise in complex systems sciences and leaders from a variety of organizations sponsored by the Prigogine Center at the University of Texas at Austin and the Plexus Institute to explore strategies for understanding uncertainty and surprise. Includes a commentary by the late Ilya Prigogine "Surprises in half a century." – Publisher.

Newman, M., Barabasi, A-L., & Watts, D. J. (2006). The structure and dynamics of networks. Princeton, NJ: Princeton University Press. ISBN 0-691-11357-2. 624p.

From the Internet to networks of friendships, disease transmission, and even terrorism, the concept and reality of networks has come to pervade modern society. What is a network? What kinds of networks are out there? Why are they interesting and what can they tell us? In recent years a range of fields – including mathematics, physics, computer science, sociology, and biology – have been pursuing these questions and building a new

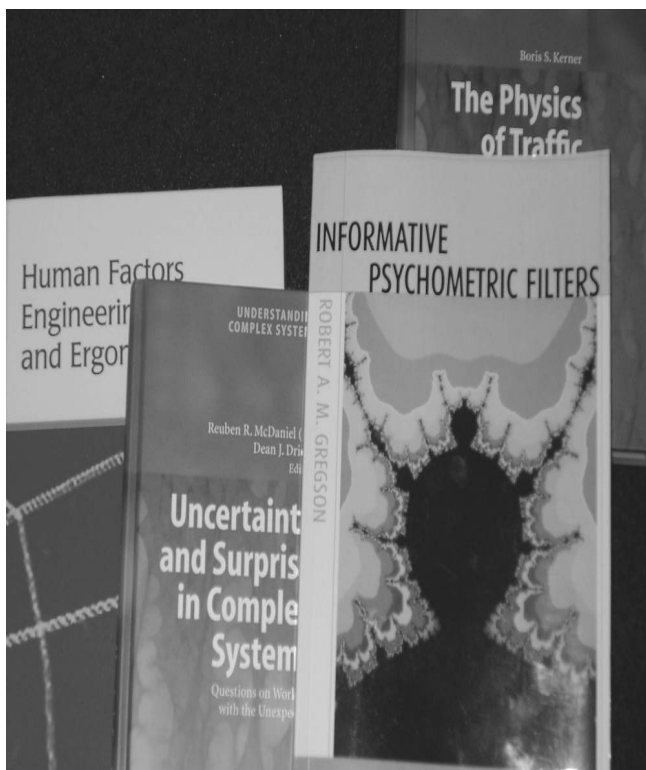
"science of networks." This book brings together a set of seminal articles representing research from across these disciplines. It is an ideal source of key research in this fast-growing field.

Ogmen, H., & Breitmeyer, B. G. (Ed.). (2006). The first half second: The microgenesis and temporal dynamics of unconscious and conscious visual processes. Cambridge, MA: MIT Press. ISBN 0-262-65107-6. 452p.

Recent advances in the study of visual cognition and consciousness have dealt primarily with steady-state properties of visual processing, with little attention to its dynamic aspects. This book brings together for the first time the latest research on the dynamics of consciousness and unconscious processing of visual information, examining the time course of visual processes from the moment a stimulus is present until it registers in a behavioral response or in consciousness a few hundred milliseconds later. The contributors analyze this "first half second" of visual processing – known as microgenesis – from a variety of perspectives, including neuroscience, neuropsychology, psychophysics, psychology, and neural network modeling. Topics include the neurophysiological correlates of dynamic processing in vision, visual masking and what it can tell us about the operation of both normal and abnormal brains; the dynamics of attentional mechanisms from electrophysiological, behavioral, and modeling perspectives, and temporal characteristics of object and feature perception. Finally, drawing on the foundations laid in earlier chapters, the book elaborates further on the dynamic relation of conscious and unconscious processes in vision. – Publisher.

Richardson, K. A., Gregory, W. J., & Midgley, G. (Eds.). (2006). Systems Thinking & Complexity Science: Insights for Action. Norwood, MA: ISCE Publishing.

Following the success of the previous ANZSYS conferences and "Managing the Complex" events, it was a pleasure to announce the 11th Annual ANZSYS/Managing the Complex V Conference. The conference was held in the city of Christchurch in New Zealand from 5-7 December 2005, and was co-hosted by the Institute of Environmental Science and Research Limited (ESR), New Zealand, and the Institute for the study of Coherence and Emergence (ISCE), USA. A lively forum for discussion and debate was provided for a wide range of academics and practitioners in the fields of systems thinking, complexity science and management. People from other disciplines who have an interest in the application of systems thinking and complexity approaches were also invited to participate. We brought together



thinkers and practitioners in the fields of systems and complexity as it seemed to us that there has been a significant international resurgence in these areas in recent years. It would appear that this has been driven by at least four simultaneous forces: (1). People right across the public, private and voluntary sectors looking for new ways to manage or deal with increasingly complex and multi-faceted problems; (2). The obviously systemic character of many high-profile issues that transcend national boundaries, from global warming to international violence; (3). The popularization of a number of systems approaches in the mid-1990s, especially among managers and policy makers, and; (4). The simultaneous popularization of complexity science, sparking major interest in new approaches to managing uncertainty.

Sole, R. V., & Bascompte, J. (2006). *Self-organization in complex ecosystems*. Princeton, NJ: Princeton University Press. ISBN 0691-07040-7. 392p.

Can physics be an appropriate framework for the understanding ecosystems? Though ecologists have long been interested in models that were originally developed by statistical physicists and later applied to explain everything from why populations crash to why rivers develop particular branching patterns, applying such concepts to ecosystems has remained a challenge. This book clearly synthesizes what we have learned about the usefulness of tools from statistical physics in ecology. Authors ask: Do universal laws shape the ecosystem, at least at some scales? They offer a compelling array of theoretical evaluations of the potential of nonlinear ecological interactions to generate nonrandom, self-organized patterns.

Sun, J-O., & Luo, A. (2006). *Bifurcation and chaos in complex systems Volume 1*. Amsterdam: Elsevier. ISBN 0-444-52229-8.

This is a volume in the Edited Series on Advances in Nonlinear Science and Complexity Series. The book is intended for engineers, physicists, mathematicians, biophysicists and students. It is claimed to be of interest to a wide range of disciplines and can be used as a reference source. Smooth and non-smooth dynamical systems, and stochastic and fuzzy nonlinear dynamical systems are some of the topics in it. – RAMG.

Trajkovski, G. (Ed.). (2006). *An imitation-based approach to modeling homogeneous agents societies*. Idea Group Publishing. ISBN 1-59140-840-7.

The book offers a framework for modeling societies of autonomous agents that is heavily based on fuzzy algebraic tools. Also seems to be of interest

to linguists and problems about the evolution of language in small groups. – RAMG.

Turchin, P. (2003). *Complex population dynamics: A theoretical/empirical synthesis*. Princeton, NJ: Princeton University Press.

Why do organisms become extremely abundant one year and then seem to disappear a few years later? Why do population outbreaks in particular species happen more or less regularly in certain locations and irregularly (or never at all) in other locations? Complex population dynamics have fascinated us for decades. By bringing together mathematical models, statistical analyses, and field experiments, this books offers a comprehensive new synthesis of the theory of population oscillations. – Publisher.

Vecchi, T., & Bottini, G. (Eds.). (2006). *Imagery and spatial cognition methods, models, and cognitive assessment*. Philadelphia: Benjamin. ISBN 90 272 5205 5. 436p.

This text spans neurophysiology, experimental psychology and spatial cognition, and thus illustrates the issues that face anyone attempting to use non-linear dynamics to model visual cognition. It is volume 66 in a series called. Advances in consciousness research. Valuable for a European perspective on lively current issues -- RAMG.

Yolles, M. (2006). *Organizations as Complex Systems: An Introduction to Knowledge Cybernetics (Managing the Complex Volume 2)*. Norwood, MA: ISCE Publishing. ISBN: 9781593114329. 836p.

This book develops a cybernetic theory of the organization as a complex autonomous and self-organizing, self-producing and self-creating social community, and in so doing it will set the scene to discuss a variety of aspects of organizational and social processes and forms that arise from a systemic view. It begins by creating a philosophical foundation, it develops a viable systems approach that proceeds to cover a whole range of topics in a coherent and integrated way that are today seen to be important to social communities. Fundamentally developing as a knowledge management text, topics covered include community mission, purposes, interests, structure, politics, ethics, control, communications, management and conflict processes. It will also deliver an appreciation of the nature and use of information, knowledge and intelligence to assist the management of social communities. The book's 16 sixteen chapters are divided into five sections: I. Fundamentals, II. Complex Organizations, III. Knowledge and Cybernetics, IV. The Cybernetics of Communication, and V. Social Behavior.

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