

# GSNP Newsletter

Topical Group on Statistical and Nonlinear Physics

October 2002

## Letter from the GSNP Chair

Under the expert guidance of Past-Chair Robert Ecke, our Topical Group on Statistical and Nonlinear Physics continued over the past year to grow in both membership and impact. On behalf of all our membership, the new Executive Committee (see p. 4) wishes to express thanks to Bob for his many contributions. We also pledge to continue the efforts to make the GSNP responsive to the desires of our membership and open to challenging new research areas in which ideas or techniques from nonlinear and/or statistical physics may play a role. Personally, I believe that the growth of the GSNP stems from the broad interdisciplinary applicability of its core concepts to some of the most exciting frontier areas of contemporary physics, including “complex materials” (such as biomolecules, granular media, and foams) and “networks” (ranging from the electrical power grid and the internet to metabolic, genomic and proteomic networks). The large attendance at our symposia in these two areas at the APS March 2002 meeting provided strong confirmation of this view. An ongoing challenge to all of us, as we move into these exciting new areas, is to retain an appropriate balance with the “traditional” aspects of our two core constituencies, statistical physics and nonlinear science. In devising the March 2003 sorting categories (see p. 3), the GSNP leadership has sought to achieve this balance. Please take a look at the categories and let us know how well you think we have done.

More generally, I would like to solicit your comments or suggestions on, and your involvement in, some of the GSNP’s many current or potential activities. Let me list five.

**Membership:** Because the GSNP is inherently interdisciplinary, nearly all of our members are also members of a more sub-discipline oriented APS division. Whether in your case this is the Condensed Matter (DCMP), Computational

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(DCOMP), Fluid Dynamics (DFD), Materials Physics (DMP), Polymer Physics (DPP), or Biological Physics (DBP), you surely know colleagues in your Division whose interests would suggest that they also be GSNP members but who have not yet joined us. If each of us recruited just one new colleague, the GSNP would grow beyond the minimum size for Divisional status.

**Meetings:** Our Executive Committee continues to believe that holding our activities at existing APS meetings—with primary focus on the APS March Meeting—is in the best interests of our membership. But we are also convinced that we should develop a presence both at more specialized APS Divisional Meetings—such as the November DFD annual meeting—and at other meetings, either society-sponsored or free-standing, including Dynamics Days (US, European, and Asian), the Rutgers Statistical Physics meeting, and the Experimental Chaos meetings. We welcome creative suggestions for precisely what form our presence at these gatherings should take.

**Gallery of Nonlinear and Statistical Physics Images:** The Division of Fluid Dynamics has developed a very successful annual competition to attract and display striking and informative images of fluid simulations and experiments. Both nonlinear science and statistical physics are rich in such images, and establishing a collection of

them—or links to websites at which such images are stored—would be useful both for research and for public relations purposes.

**Ties to our International Counterparts:** I am pleased to report that Maxi San Miguel, the current Chair of the Statistical and Nonlinear Division of the European Physical Society (SNP/EPS) has recently contacted me with a suggestion that we seek ways in which our two units can work more closely together. We have already established links between our webpages, and a former Chair of the GSNP (Guenther Ahlers (UCSB)) has joined the board of the SNP/EPS. Suggestions for further interactions of this sort are welcome.

**Involvement in GSNP Leadership:** If any of the previous suggestions appeals to (or distresses!) you, please consider becoming involved in the leadership of the GSNP. Our nominating committee, this year led by Professor Cristina Marchetti (Syracuse), will be delighted to receive suggestions (including self-nominations) of individuals who want to help make the GSNP a still better organization.

Finally, let me remind you all that our updated GSNP website (<http://www.aps.org/units/gsnp>) contains useful information about all the issues discussed above, as well as other matters of interest to our membership.

David K. Campbell  
Chair, GSNP

## Physical Review E

In July 2002, the APS announced the selection of Gary Grest (Sandia National Laboratory) as the new Editor of Physical Review E. Gary is a fellow of the APS and, as a long-time member of the GSNP, is “one of our own.” We are delighted by his selection and look forward to his stewardship of this important journal, in which many articles of interest to our membership appear.

## Electronic Balloting for GSNP Officers

Officers of the Topical Group on Statistical and Nonlinear Physics are elected in the fall of each year with terms beginning in March of the

following year. The duties and terms of service for these positions are spelled out in the Bylaws of the GSNP (<http://www.aps.org/units/gsnp/bylaws>). Balloting is done by e-mail.

## Minutes of 2002 GSNP Meeting March 19, 2001 • Indianapolis, IN

Attendance: Guenter Ahlers, Bob Behringer, Eberhard Bodenschatz, David Campbell, Bob Ecke, Randy Kamien, Dan Lathrop, Andrea Liu, Mark Robbins, Jeff Urbach

Guests: Judy Franz, APS

Election results: Vice Chair - **Mark Robbins** (Johns-Hopkins Univ.) Member-at-Large: **Walter Goldberg** (Univ. Pittsburgh), **Cristina Marchetti** (Syracuse University).

Membership: There are currently 660 members of GSNP, up from 631 last year. Another 11 new members were signed up in Indianapolis.

Meetings: In the future, the GSNP executive committee meeting will be a dinner meeting on Monday evening at the March meeting. A short business meeting, followed by a reception, will be held on Tuesday evening.

PR: Judy Franz said that APS is always looking for appealing images, and our community produces many of those (see the remarks on the Gallery of Nonlinear and Statistical Physics Images on p. 1). Images can be sent directly to her, and the Executive Committee would appreciate receiving copies as well.

## APS Fellows

Each year, the GSNP Fellowship Committee will review nominations for APS Fellows and make recommendations to the APS. The total number of APS Fellows who may be elected in a given year is limited to one-half of one percent of the total APS membership. Therefore, the selection process is quite competitive, and sponsors should be aware of this when preparing nominations.

Nominations may be made at any time during the year, but only those received by the deadline set by APS, currently April 2, will be considered for action in the same year. Nomination forms, as well as tips on preparing an effective nomination, are available electronically at <http://www.aps.org/units/gsnp/nominate.html>. The nomination form was modified for 2001 so get a current version. Completed forms should be returned to the APS Fellowship Program Office at the same address. Nominations on which no favorable action is taken are generally reconsidered the following year. Sponsors may, however, resubmit the nomination with updated supporting material prior to the deadline for the following year.

In 2001, 3 candidates were recommended by GSNP and selected for Fellowship in the American Physical Society:

**Rashmi Desai** (University of Toronto)

“For applications of statistical mechanics to materials science, including: phase separation and ordering kinetics in systems with competing interactions, Langmuir films, ferromagnetic films, epitaxially grown solid films, and order-order transitions in polymeric systems.”

**Charles Doering** (University of Michigan) “For fundamental contributions to the analysis of noisy and nonlinear dynamical systems, including co-discovery of resonant activation, current reversals in stochastic ratchets, and rigorous dissipation rate bounds for incompressible turbulence.”

**Howard Lee** (University of Georgia) “For developing the method of recurrence relations to study dynamic behavior in many particle systems. Established an equivalence between Fermi and Bose gases in two dimensions.”

## March Meeting Invited Symposia

GSNP is sponsoring three symposia at the upcoming March meeting. The topics and invited speakers are listed below, and we hope to see you there!

- ◆ **Stochastic Effects in Soft Condensed Matter Physics** *Guenter Ahlers, Jose Ortiz de Zarate, Peter Jung, Ian Parker*

- ◆ **Plasticity, Fracture and Earthquakes** (joint with DMP) *Huajian Gao, Wole Sobojejo, Eric Stach, Nadia Lapusta and Michael Marder*
- ◆ **The Statistical Physics of Food-Webs** *Alan Hastings, Roger Guimera, Neo Martinez, Ricard V. Sole, Tim Keitt*

## March Meeting Sorting Categories

The sorting categories for Statistical and Nonlinear Physics are different from past years reflecting the increasing breadth of GSNP interests. Also please note the wide range of Focus Sessions arranged by GSNP, in collaboration with other units. More information about the Focus Sessions can be found on the March Meeting website, at <http://www.aps.org/meet/MAR03/focus.html>.

### 12. Statistical and Nonlinear Physics

- 12.1 Low-Dimensional and Quantum Chaos
- 12.2 Noise and Stochastic Resonance
- 12.3 Pattern Formation & Spatio-Temporal Chaos
- 12.4 Coherent Spatial Structures: solitons, intrinsic localized modes, discrete breathers
- 12.5 Granular Media
- 12.6 Equilibrium Statistical Mechanics: fundamentals, exactly solvable models
- 12.7 Systems Far from Equilibrium
- 12.8 Networks and Complex Systems
- 12.9 Disordered nonlinear systems and glassy dynamics

### Special Focus Topics

- 12.10.1 Plastic Deformation and Fracture (DMP/GSNP)
- 12.10.2 Stochastic Properties of Ions in Protein Channels (GSNP)
- 12.10.3 Polymers in Fluid Flow (GSNP/DFD)
- 12.10.4 Micro/nano-fluidics (GSNP/DFD)
- 12.10.5 Instabilities, Shocks, Transitions, and Forces in Granular Flows (GSNP/DFD)
- 12.10.6 Brownian Motors: From Ratchets to Biological Systems (GSNP)
- 12.10.7 Statistical Mechanics of Non-Extensive Systems (GSNP)
- 12.10.8 Nonequilibrium Quantum Dynamics in Electronic and Magnetic Systems (FIAP/DMP)

# GSNP Executive Committee 2002-2003\*

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## *March Meeting Program Committee (2002)*

### **R. Behringer (Chair)**

## *Fellowship Committee (2002)*

### **M. Robbins**

## *Nominating Committee (2002)*

### **A. Liu (Chair).**

## *Publications Committee*

### **E. Bodenschatz**

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\* Expiration Date for Position Noted after the Name