



# AMERICAN NUCLEAR SOCIETY MATHEMATICS AND COMPUTATION DIVISION

May, 2003

<http://www.mcd.ans.org/newsletters>

## *Message from the Vice Chair*

Several events have transpired since the last MCD Newsletter, two of them part of the normal life of the division. First, a slate of new officers has been elected, to take office at the end of the ANS Meeting in San Diego in this June. Our new treasurer is Bill Martin, who will be taking over from Glenn Sjoden. Glenn has done a superb job that has included a time-consuming, root-and-branch review of how we do financial business, verification of expenditures with the ANS HQ staff, and a proposal adopted by the Executive Committee to make our student support expenditures routine. He has improved the division leadership's awareness of financial matters. Michael Scott will be taking over the secretarial burdens so ably carried for the last year by Piero Ravetto. Bernadette Kirk will be our new vice chair/chair-elect, and brings a wealth of professional division leadership experience, including a stint as Radiation Protection and Shielding Division chair. Our current chair, Richard Sanchez, has been energetic and dedicated to the success of MCD, and we will count on his counsel in the future. The three new Executive Committee members, whose terms will expire in 2006, are Jeffrey Favorite (LANL), Farzhad Rahnema (Georgia Tech), and Scott Palmtag (Studsvik of America).

Second, the organizers of the M&C 2003 Topical Meeting in Gatlinburg in April should be congratulated on the successful meeting. The program was strong and innovative, with its lecture series that covered most of the technical areas in which MCD members are involved. Attendance was very good, and the logistical aspects, i.e., the meals provided the participants with an unusual degree of convenience. See below for more details.

Third, the Society's Professional Divisions Committee, chaired by Don Hoffman, has implemented a system of "Division Vitality Metrics" aimed at assisting division leaders in identifying both exemplary and problem areas in the conduct of division business. MCD's metrics for 2002 are generally strong, with only one (anomalous) problem area. Bernadette Kirk will have the metrics available at the San Diego Executive Committee meeting.

There are a few things I believe we should be doing to make our processes go a bit more smoothly. One, mentioned above, is to automatically include recurring student support and awards expenditures in the budget, barring unforeseen circumstances. A second is to enhance our succession planning by establishing fixed (but renewable) terms for committee chairs and by attempting to bring future successor chairs into active committee participation well before they are to be appointed as chairs. The Executive Committee will be reviewing our bylaws and procedures to this end, but an important contribution will have to come from the MCD membership. We need to identify MCD members who would make good leaders, and strongly encourage them to be active committee members or to chair certain committees. Everyone who volunteers to chair a committee should be able to do so with the assurance that his commitment term is not open-ended. By the same token, there is no reason why a productive committee chair should not be able to serve more than one term, especially when no successor has been identified and trained. Please send the names of prospective leaders and committee members to me or anyone on the Executive Committee. Finally, in the era of electronic paper reviews, it would be helpful to prospective authors and paper reviewers if MCD specified ANS paper acceptance criteria and recommended topical meeting paper acceptance criteria and publicized them. I welcome your comments and suggestions on these issues.

Roger Blomquist, Vice Chair

## M&C 2003, Gatlinburg – Another Successful Topical Meeting for MCD!

The American Nuclear Society's 2003 Topical Meeting sponsored by the Mathematics and Computation Division, and co-sponsored by the Reactor Physics and Radiation Protection and Shielding Divisions, was held in Gatlinburg, Tennessee, April 6-10, 2003. The conference attracted 225 participants from 22 countries, including 35 students (who received complementary registration) from 6 countries. The conference proceedings were published on CD-ROM, additional copies of which can be ordered from ANS either through [accounting@ans.org](mailto:accounting@ans.org), or by contacting Ms. Sue Cook (708-579-8210 or [scook@ans.org](mailto:scook@ans.org)); ISBN: 0-89448-674-8; **ANS Order Number:** 700300; **Price:** \$125.00

The Technical Program for the conference revolved around the theme of its title, *Nuclear Mathematical & Computational Sciences: A Century in Review, A Century Anew*. The *Anew* component comprised 150 invited and contributed papers organized in 25 regular and special sessions on a broad variety of topics, plus a poster session and a panel session. The *Review* component of the conference, the *Gelbard Review Lecture Series*, was a marked departure from the standard Plenary Session format. It comprised seven invited lectures by world-renowned leaders in selected topics. The lecture series was dedicated to the memory of Ely Gelbard who co-organized this series with Yousry Azmy and Enrico Sartori. An invited colleague of Dr. Gelbard briefly reminisced on his life and career then introduced one of the invited lecturers in the series. The lectures were videotaped and the video/audio stream will be published on CD embedded in the corresponding PowerPoint presentation. The PowerPoint lectures are available on the web at <http://www-rsicc.ornl.gov/MC2003LectureFiles/Gelbard.htm>

In selecting the slate of invited lecturers every attempt was made to include international colleagues. Regrettably, only one was willing and able to accept the invitation at the time it was extended, then apologized due to unforeseen circumstances.

The lecture syllabus was:

- Deterministic Methods for the First-Order Transport Equation, by Ed Larsen (Univ. of Michigan) and Jim Morel (LANL)
- Deterministic Transport Methods of the Second Order, by Elmer Lewis (Northwestern Univ.)
- Monte Carlo Methods, by Jerome Spanier (Univ. Calif. At Irvine)
- Reactor Core Methods, by Kord Smith (Studsvik Scanpower)
- Reactor Kinetics and Dynamics, by Jack Dorning (Univ. of Virginia)

**[Provided by Yousry Azmy!]**

**Editor's Message:** This newsletter will be issued twice a year and can be accessed electronically at <http://www.mcd.ans.org/newsletters>. Please send your news and *constructive* comments to me, Todd Palmer at the Oregon State University Department of Nuclear Engineering and Radiation Health Physics, 116 Radiation Center, Corvallis, OR 97331-5902; FAX (541) 737-0480; email: [palmerts@ne.orst.edu](mailto:palmerts@ne.orst.edu); or call (541) 737-7064

- Resonance Theory in Reactor Applications, by R. N. Hwang (ANL)
- Reactor Kinetics and Dynamics, by Jack Dorning (Univ. of Virginia)
- Criticality Safety Methods, by Elliott Whitesides (ORNL)

**Other notable events and distinguished speakers included the following:**

- ❖ Welcome address by Dr. Lee Riedinger, Deputy Laboratory Director for Science and Technology, Oak Ridge National Laboratory.
- ❖ Welcome address by Dr. Larry Foulke, Vice President of the American Nuclear Society and Consultant at Bettis Power Laboratory.
- ❖ Luncheon in honor of Dr. I. K. Abu-Shumays, recently retired from Bettis Power Laboratory, with Dr. Foulke and Dr. Mike Natelson, both from Bettis Power Laboratory serving as MCs.
- ❖ Dinner celebrating RSICC's 40<sup>th</sup> Birthday, with Hamilton Hunter serving as MC. The program included testimonials from various distinguished individuals in the field, most notably Betty Maskewitz, former director of RSICC, and Dr. Alvin Weinberg, Nobel Laureate, and former director of Oak Ridge National Laboratory.
- ❖ Conference banquet, with Bernadette Kirk serving as MC. The program included a memorial to Ely Gelbard by Dr. Mike Natelson, and the announcement of M&C 2005 in Avignon, France, by Dr. Richard Sanchez. The banquet speaker was Joseph Salomon, Louvre Museum, Paris, France, who made an interesting presentation entitled "Ion Beam Analysis of Art Works: 14 Years of Use in the Louvre".
- ❖ A Best Student Paper competition was organized and the following awardees were recognized in the conference banquet:
  - First Prize, \$500: Jae H. Chang, Texas A&M University.
  - Second Prize, \$200: Allen Toreja, presently at Lawrence Livermore National Laboratory.
  - Third Prize, \$100: Dobby Kastanya, North Carolina State University.
- ❖ RSICC Best Poster winner: Thomas A. Brunner, Sandia National Laboratorie

*Gelbard Series Lectures with Alvin Weinberg – RSICC's 40<sup>th</sup> Birthday*



Front row (left to right): Dick Hwang, Jack Dorning, Alvin Weinberg, Jerry Spanier  
Back row (left to right): Yousry Azmy, Ed Larsen, Enrico Sartori, Elliott Whitesides, Elmer Lewis, Kord Smith

*Joint Benchmark Committee Meeting – San Diego*

The Joint Benchmark Committee (JBC) (joint with RPD and RPSD) will be held in the Dover Room on Sunday at 11 am. Please try to attend as we (M&C) typically have a weak presence at this meeting. You will learn about several of the RP and RP&S benchmarks that are currently being considered. In addition, I will be proposing a new category of benchmarks dealing with analytical solutions (what else would I do?). We will also discuss what we (JBC) are all about. Finally, those who attend are invited to the JBC Chair's peanuts/cocktail gala at 6 or so in the nearest lounge. See you there. – B. Ganapol

## ***Gerald C. Pomraning Memorial Award Presented***

Dr. Gerald C. Pomraning was posthumously awarded the inaugural Gerald C. Pomraning Memorial Award in recognition of his many important contributions to the development of variational and asymptotic methods, and mathematical techniques for analyzing nonlinear thermal radiation transport, charged particle beams, and particle transport in random media. This award was established to memorialize Dr. Pomraning for

his work that has greatly impacted theoretical work and mathematical modeling across the field of nuclear engineering. The award was presented to Ms. Lucia Pomraning Levermore, Dr. Pomraning's widow, during the evening banquet of the Mathematics and Computations Division topical meeting held in Gatlinburg this past April.

## ***MCD Roundtable – ANS Summer Meeting, 2003***

At the MCD Roundtable in San Diego, Robert Singleterry [NASA Administrator's Fellow] will present "Reconfigurable Computing for Nuclear Science and Technology"

### Abstract

A new computer archetype is appearing that does not utilize the standard CPU but Field Programmable Gate Arrays (FPGA). While FPGAs have been around about 5 years, they have been used in the digital signal-processing realm. Star Bridge Systems

has developed a new system that utilizes FPGAs and a new, retargetable programming language call VIVA to enter the supercomputing market. While very much in its infancy, NASA Langley is trying to help direct development to suit its needs and hopefully, the needs of others. The new computing archetype changes the way that programmers must think about algorithms. This roundtable will show, discuss, and demo this new reconfigurable computing world and how it could be used for nuclear science and technology.

## ***PHYSOR 2004 - Chicago***

The Reactor Physics Division of the American Nuclear Society is pleased to invite you and your organization to participate in the PHYSOR-2004 Topical Meeting to be held April 25-29, 2004, at the Hyatt Regency Hotel, Chicago, Illinois. The meeting is being hosted by the Chicago Section of the ANS and co-sponsored by the OECD Nuclear Energy Agency. See <http://www.ans.org/meetings> for details and the call for papers.

Summaries (1000 words) may be submitted at <http://www.ans.org/meetings/physor>, and will be reviewed for

inclusion in the program. The deadline for submission of summaries is September 5, 2003. Final (full length) papers must be submitted by February 2, 2004.

The theme of the meeting is The Physics of Fuel Cycles and Advanced Nuclear Systems: Global Developments; the technical program will cover more than 15 topical focus areas.

## ***Notes from the Program Committee (Anil Prinja, Co-Chair)***

### M&C Sponsored Special Sessions – San Diego

1. Particle Transport Methods in Medical Applications - Organized by Alireza Haghigat

### M&C Sponsored Special Sessions – New Orleans

1. Subgrid Methods for Transport in Heterogeneous/Stochastic Media (Invited and Contributed) - Organized by Jim Morel
2. Monte Carlo Methods for Large-Scale Reactor Calculations (Invited and Contributed) - Organized by Tom Sutton
3. OECD/NEA 3-D Mixed Oxide Fuel Assembly Benchmarking Calculations (Invited and Contributed) - Organized by Elmer Lewis

I would like to inform reviewers of MCD session papers that the electronic paper review for the Winter Meeting will take place between June 23 and July 9, 2003. With three special sessions and four regular sessions, MCD will have a very significant presence at this meeting and I am requesting that reviewers be especially conscientious in providing timely critiques of submitted summaries during this review period. Members who haven't reviewed summaries for previous meetings but are interested in becoming reviewers for future meetings should contact me ([prinja@unm.edu](mailto:prinja@unm.edu)) immediately and I will have them officially listed as reviewers.

## Upcoming Meetings

*2003 ANS Annual Meeting  
The Nuclear Technology Expansion – Unlimited Opportunities!  
San Diego, CA, June 1-5, 2003.*

For more information, see <http://www.ans.org/meetings/annual>.

*SNA 2003  
International Conference on Supercomputing in Nuclear Applications  
Paris, France, September 22-24, 2003.*

Cosponsored by CEA, SFANS, co-organizer: OECD/NEA. For more information - email [SNA-2003@cea.fr](mailto:SNA-2003@cea.fr), and see <http://SNA-2003.cea.fr>

*Supercomputing 2003  
Igniting Innovation  
Phoenix, AZ, November 15-21, 2003..*

For more information, see <http://www.sc-conference.org/sc2003/>.

*2003 ANS Winter Meeting  
Nuclear Technology: Achieving Global Economic Growth While Safeguarding the Environment  
New Orleans, LA, November 16-20, 2003.*

For more information, see <http://www.ans.org/meetings/pdfs/2003/wm2003-cfp.pdf>.

*PHYSOR 2004  
Topical Meeting on Reactor Physics  
Chicago, IL, April 25-29, 2004.*

For more information, see <http://www.ans.org/meetings/physor>.

[More information about relevant conferences can be found at <http://www-rsicc.ornl.gov/Newsletters/> and <http://www.ans.org/meetings>.]

## November, 2002 Executive Committee Meeting Notes

1. Student support is the largest single component of our financial outlays, in the following forms: (1) Complimentary tickets to the President's Reception (not included in student registration) will generally be provided by MCD for students (age 21 or over) presenting papers in MCD-sponsored sessions; (2) \$1000 was donated to the ANS Student Conference at Berkeley; (3) \$1000 was donated to the Dannell Scholarship fund in lieu of the Penn State ANS Student Conference; (4) \$600 was provided to M&C2003 for three best student paper awards; (5) MCD will generally provide \$500 for student travel to each ANS national meeting; and (6) MCD will generally provide \$1000 for student travel to MCD topical meetings. This shows a substantial commitment to students.

2. The Honors and Awards, Membership, Joint Benchmark, Publicity, Program, and Standards Committees made their

reports. All of them are in need of additional members both to pursue their goals and to provide continuity in leadership succession in the years to come. If you feel you can contribute in any of these areas, please contact the committee chair or anyone on the Executive Committee. We hope to institute fixed-length (but renewable) chair tenures to encourage new participants. This should keep a flow of new ideas and energy into MCD leadership positions and allow those who are already serving a wider variety of opportunities to lead MCD.

3. The MCD treasurer, Glenn Sjoden, has completed a root-and-branch reorganizaion of the MCD finances. One important improvement was to standardize our student support budget so that these are automatically in the MCD budget, which ought to improve our support of students and shorten our Executive Committee Meetings a bit.

## **2003-2004 ANS MATHEMATICS AND COMPUTATIONS DIVISION OFFICERS**

Chair: Roger Blomquist (ANL, 630/ 252-8423, rnbloquist@anl.gov)  
Vice-Chair/Chair Elect: Bernadette L. Kirk (ORNL, 423/574-6176, blk@ornl.gov)  
Secretary: Michael Scott McKinley (LLNL, 925/424-2738, mckinley9@llnl.gov)  
Treasurer: William R. Martin (Univ. of Michigan, 734/764-5534, wrm@umich.edu)  
Outgoing Chair: Richard Sanchez (CEA de Saclay, 33-01-5908-5404, richard.sanchez@cea.fr)

### **EXECUTIVE COMMITTEE**

2003 Bernadette L. Kirk (ORNL, 423/574-6176, blk@ornl.gov)  
2003 William R. Martin (Univ. of Michigan, 734/764-5534, wrm@umich.edu)  
2003 Richard Sanchez (CEA, 33-01-5908-5404, richard.sanchez@cea.fr)  
2004 Barry Ganapol (U. Arizona, 520/621-4728, cowboy.ganapol@nee.arizona.edu)  
2004 Nam Zin Cho (KAIST, 82-42-869-3819, nzcho@sorak.kaist.ac.kr)  
2004 John Wagner (ORNL, 865/241-3570, wagnerjc@ornl.gov)  
2005 Tom Sutton (KAPL, 518/395-7407, sutton@kapl.gov)  
2005 Cassiano De Oliveira (Imperial College, London, 44-20-7594-9319, c.oliveira@ic.ac.uk)  
2005 Madeline Feltus (USDOE, 202/506-0541, madeline.feltus@hq.doe.gov)  
2006 Jeffrey Favorite (LANL, 505/667-7941, fave@lanl.gov )  
2006 Farzhad Rahnema (Georgia Tech, 404/894-3731, farzad.rahnema@nre.gatech.edu)  
2006 Scott Palmtag (Studsvik Scandpower, 208/522-8304, palmtag@soa.com)

### **BOARD LIAISON**

Larry Foulke (Bettis, 412/476-7511, larry.r.foulke@verizon.net)

### **CHAIRS OF STANDING DIVISION COMMITTEES**

FINANCE: William R. Martin  
HONORS AND AWARDS: Paul Turinsky (N.C. St. Univ., 919/515-5098, turinsky@eos.ncsu.edu)  
MEMBERSHIP: Madeline A. Feltus  
NOMINATING: Forrest Brown (LANL, 505/667-7581, fbrown@lanl.gov)  
PROGRAM: Anil Prinja (U. New Mexico, 505/277-4600, [prinja@unm.edu](mailto:prinja@unm.edu)) and  
Ali Haghghat (U. Florida, 352/392-1401, haghgha@ufl.edu)(Co-Chairs)  
PUBLICITY: Todd Palmer (Oregon St. U., 541/737-7064, palmerts@ne.orst.edu)  
STANDARDS: Andy Smetana (Westinghouse SRC, 803/725-4192, andrew.smetana@srs.gov)