

# Physics Computing News: Spring 1994

Newsletter of the Division of Computational Physics

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Questions regarding the items in this newsletter or suggestions for future issues of *Physics Computing News* should be directed to C. Richard DeVore, Newsletter Editor. His address is given in the Roster on page 5.

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## PRIZES & AWARDS

### 1994 Aneesur Rahman Prize Winner: John M. Dawson

John M. Dawson, Professor of Physics at the University of California at Los Angeles, has been selected as the second recipient of the Aneesur Rahman Prize. Established in 1992 by the IBM Corporation, the prize is intended to recognize and encourage outstanding achievement in computational physics research.

Professor Dawson's citation reads, "In recognition of his leading role in opening the field of computer simulation of plasmas, and for numerous major contributions made using plasma simulation as a complement to analytic theory and experiment. He has led in opening the field of plasma-based accelerators and made major advances in understanding basic nonlinear plasma wave processes, anomalous absorption and transport, advanced plasma-based coherent light sources and space plasma phenomena."

Professor Dawson received his Ph.D. from the University of Maryland in 1957. He then joined the staff of the Princeton Plasma Physics Laboratory, where he eventually headed the theoretical group and became a member of the Princeton University faculty. In 1973, he left to become a professor of physics at UCLA. Among other recognitions and honors bestowed on him, Professor Dawson was elected to the National Academy of

Science in 1977, and in that year also received the James Clerk Maxwell Prize from the American Physical Society's Division of Plasma Physics.

## 1995 Aneesur Rahman Prize: Call for Nominees

The Aneesur Rahman Prize was established by the American Physical Society in 1992 to recognize and encourage outstanding achievement in computational physics research. The Prize is sponsored by the International Business Machines Corporation, and consists of \$5,000, an allowance for travel to the meeting of the Society at which the prize is awarded and the recipient delivers the Rahman Lecture, and a certificate citing the contributions made by the recipient.

The third Rahman Prize will be awarded at the Division's Annual Meeting in June 1995. Nominations will close on September 1, 1994. Division members who wish to nominate deserving colleagues for the Rahman Prize are encouraged to do so before that date. Announcements will appear periodically in *APS News* over the intervening months.

Nominations are open to scientists of all nationalities regardless of the geographical site at which the work was done. The prize shall ordinarily be awarded to one person, but a prize may be shared among recipients when all recipients have contributed to the same accomplishments.

Send the name of the proposed candidate and supporting information, including a *curriculum vitae* of the nominee, a description of the important contributions for which the nominee is being recognized, and a proposed citation, to: Ralph Z. Roskies, APS/DCO Prize & Award Committee, Pittsburgh Supercomputing Center, 4400 Fifth Avenue, Pittsburgh PA 15213.

## FELLOWSHIP PROGRAM

In 1993, the Division of Computational Physics had 7 members elevated to Fellowship in the APS. We congratulate these colleagues on being so honored. The new Fellows are:

Viktor Konstantyn Decyk - "For his pioneering work in the area of plasma simulations including applications of parallel computers to plasma modeling and the use of computers in the teaching of plasma physics."

James Edward Gubernatis - "For his contributions to the methodology and the application of quantum simulation techniques to interacting electron problems in condensed matter physics."

Dennis W. Hewett - "For significant contributions to the formulation of implicit plasma simulation methods to the solution of linear systems, and for many advances in successfully modeling experiments."

Malvin H. Kalos - "For his seminal work in the development and application of Monte Carlo methods to statistical physics."

Kimo Kaski - "For contributions to the physics of transport properties, phase transitions, and droplet spreading."

Elaine Surick Oran - "For innovations using cutting edge computers to model and explain important physical mechanisms involving fluid dynamics, chemistry, and nonequilibrium material properties in complex reacting flows ranging from laboratory to astrophysical systems."

Ralph Z. Roskies - "For fundamental contributions to theoretical high-energy physics and the promotion of computational physics through the Pittsburgh Supercomputer Center."

– Michael Creutz

## JOURNALS & PUBLICATIONS

### Computers in Physics: Call for Educational Software Submissions

Computers in Physics (CIP) is continuing its sponsorship of an annual contest for the best in educational physics software. Over the past four years the winners have included inventive and creative educators and researchers from institutions of all sizes and from all regions of the country. The scope of the contest is broad, with entries from such areas as simulations, demonstrations, microprocessor-based laboratories, and utilities. Starting this past year, we have included a prize for the best undergraduate student entry; this software is not limited to pedagogy and may be associated, for example, with a research project.

CIP is seeking submissions for the next contest. The deadline for submitting software is May 31, 1994. Write to Computers in Physics, 500 Sunnyside Boulevard, Woodbury, NY 11797 for application materials.

– Harvey Gould, *CIP*

## MEETING ANNOUNCEMENTS

### Physics Computing '94

Physics Computing (PC) '94 will be held from Monday, August 22 through Friday, August 26 at Palazzo dei Congressi, Lugano, Switzerland.

PC '94 will give a detailed overview on the newest research results and developments in computational methodology for academia and industry, including invited papers, contributed papers, poster sessions, tutorials and vendor exhibitions. The purpose of the conference is to bring together researchers interested in innovative approaches in computational physics. Special emphasis will be given to algorithmic and high-performance computer implementation issues. Tutorial sessions organized by leaders in their respective fields will be held on the first conference day.

The registration fee, not including tutorials and accommodations, will be 370 Swiss francs for individual members of the EPS and affiliated societies, and 400 francs for nonmembers. A limited number of scholarships will be available for students. More detailed information concerning scholarships can be obtained through the Conference Secretariat. Registration and hotel reservation forms will be sent upon request.

PC '94 is jointly organized by the Centro Svizzero di Calcolo Scientifico (CSCS), Manno, Switzerland, belonging to ETHZ (Swiss Federal Institute of Technology Zurich), the EPS Interdisciplinary Group on Computational Physics, and by the American Physical Society Division of Computational Physics.

For further information please contact the Conference Secretariat at the following address:

PC '94 - Secretariat  
c/o CSCS  
Centro Svizzero di Calcolo Scientifico  
Via Cantonale, Galleria  
CH 6928 Manno (TI)  
Switzerland

tel: +41-91-508211

fax: +41-91-506711

e-mail: pc94@cscs.ch

– Marco Tomassini, *EPS*

## 15th International Conference on the Numerical Simulation of Plasmas

This is the first announcement of the 15th International Conference on the Numerical Simulation of Plasmas. The meeting will be hosted by the Princeton University Plasma Physics Laboratory and the United States Department of Energy, with J. Manickam, J. L. Johnson and W. Sadowski the principal organizers. The meeting will be held at the Sheraton Valley Forge Hotel, on Wednesday through Friday, September 7–9, 1994. The hotel is in Valley Forge, a pleasant suburb of Philadelphia, Pennsylvania, U.S.A., and is easily reached by a shuttle bus from the Philadelphia International Airport. Monday, September 5, is Labor Day, a major holiday in America, so you may plan to take a few days of vacation before or after the meeting.

Oral and poster papers will be welcomed on aspects of computational plasma physics, with contributions on solutions to the Vlasov-Maxwell equations, magnetic and inertial fusion, beam propagation, accelerators, astrophysical studies, as well as standard PIC and gyrokinetic simulations encouraged.

The conference is being cosponsored by the American Physical Society's Division of Computational Physics.

A more complete mailing, including the composition of the program committee and details concerning registration and preparation and submission of four page extended abstracts for the conference proceedings, will be forthcoming. The deadline for registration and paper submission will be July 1, 1994. For further information or to be placed on the mailing list, contact:

Gale Stevens  
P. O. Box 451  
Princeton NJ 08543  
e-mail: gstevens@theory.pppl.gov

– John Johnson, *PPPL*

## Symposium on Computational Molecular Dynamics

The University of Minnesota Supercomputer Institute is hosting an international symposium on Computational Molecular Dynamics, Monday through Wednesday, October 24–26, 1994 (with a reception on Sunday the 23rd), at the Hubert H. Humphrey Center located on the University of Minnesota campus in Minneapolis. The coverage of the symposium will include all aspects of the dynamics of molecular systems and the use of molecular dynamics simulations in quantum and classical, few-body and many-body, physics and chemistry.

The symposium organizers are Jan Almlöf (University of Minnesota), Evelyn Goldfield (Cornell Theory Center), Katherine Holloway (Merck Research Laboratories), William Jorgensen (Yale University), Peter Rossky (University of Texas at Austin), George Schatz (Northwestern University), and Donald Truhlar (University of Minnesota). The symposium is being cosponsored by the University of Minnesota Supercomputer Institute, the American Chemical Society's Divisions of Computational Chemistry and Physical Chemistry, and the American Physical Society's Division of Computational Physics.

The organizing committee has developed a list of invited speakers that will insure that the program is at the forefront of the field. Currently, the list of confirmed speakers includes Bruce Berne (Columbia University), Emily Carter (University of California-Los Angeles), Jim Chelikowsky (University of Minnesota), Paulette Clancy (Cornell University), Trygve Helgaker (University of Oslo), Michael Klein (University of Pennsylvania), Ronnie Kosloff (Hebrew University), Claude Leforestier (University of Paris-Sud), Peter Lomdahl (Los Alamos National Laboratory), Craig Martens (University of California-Irvine), Ken Merz (Penn State), Tamar Schlick (Courant Institute), Terry Stouch (Bristol Meyers Squib), and Steve Walch (NASA-Ames). Ten additional domestic and four European speakers have been invited but are not yet confirmed.

In addition to the invited talks, there will also be poster papers to contribute to what we anticipate will be a fruitful exchange of information among a broader group of computational chemists and physicists than one usually encounters at a single meeting. Confirmed poster contributors at this date include H. Ted Davis (University of Minnesota), David Ferguson (University of Minnesota), Evelyn Goldfield, J. Woods Halley (University of Minnesota), Peter Rossky, George Schatz, and Donald Truhlar. Additional contributed poster papers are welcome; prospective authors should contact the symposium administrator.

The registration fee for the symposium is \$150 for registrations received prior to October 3, and \$175 after October 3. A 10 percent discount will be given to members of the cosponsoring divisions of the American Physical Society and American Chemical Society, as listed above.

To receive more information regarding the meeting, including the current list of speakers, contact:

Michael J. Olesen  
Supercomputer Institute  
University of Minnesota  
1200 Washington Avenue South  
Minneapolis MN 55415  
  
tel: (612) 624-1356  
fax: (612) 624-8861  
  
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– Michael Olesen, *MSI*

## ROSTER OF EXECUTIVE COMMITTEE

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# INSTRUCTIONS FOR VOTING

In this year's election we will elect a Vice Chair and two Members at Large of our Executive Committee. The candidates to be elected this year will serve on the Executive Committee of the Division for three years; their terms expire in the Spring of 1997.

For each of these positions we have two or more candidates. Their biographical information and policy statements are included to help inform you about them. Enclosed is a ballot sheet and a return envelope. Please vote for one candidate for the office of Vice Chair and for two candidates among those running to be Members-at-Large.

Mail your ballot in the enclosed envelope to the Secretary-Treasurer of the Division. It must be received by April 15, 1994 for it to be counted.

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## INFORMATION ABOUT THE CANDIDATES

### Vice-Chair

#### **Fereydoon Family**

*Samuel Candler Dobbs Professor of Physics  
Emory University*

Fereydoon Family is Samuel Candler Dobbs Professor of Physics and member of the Emerson Center for Scientific Computation at Emory University where he has been since 1981. Before joining the Emory faculty he was a Research Scientist in the Department of Physics and the Center for Polymer Studies at Boston University. He received his B. S. Degree in Physics from Worcester Polytechnic Institute in 1968 and his Ph.D. in Physics from Clark University in 1974. He was a postdoctoral Research Associate in the Physics Department at MIT from 1974 to 1975. He also has been a Visiting Scientist at the Institute for Theoretical Physics at the University of California at Santa Barbara and a Visiting Associate Professor of Chemistry at MIT. His research interests have spanned a wide range of topics in computational and simulational condensed matter physics, including quantum fluids, critical phenomena, conformation of polymers, percolation and gelation transitions, kinetics of aggregation and fractal aspects of non-equilibrium growth phenomena. His current research interests are in modeling and simulation of the evolution and morphology of surfaces, interfaces and thin films.

He has been an active member of the Division of Computational Physics since its inception and has served as symposium organizer and invited speaker at the Division meetings. He was the Division's organizer of the computation physics symposium at the March 1993 meeting of the American Physical Society. He is a Fellow of the APS and recipient of the Southeastern Section of the American Physical Society's highest honor for distinguished research in physics, the J. W. Beams Award, for his "outstanding contributions in computer simulations of non-equilibrium growth phenomena and of equilibrium behavior near phase transitions."

#### *Candidate's Statement*

Computational physics encompasses almost all areas of experimental and theoretical branches of physics and the physics community has begun to recognize its potential as the third way of doing science alongside theoretical and experimental techniques. The healthy growth of the Division of Computational Physics and the speed with which it became a full division of the APS is certainly an indication of this fact. With the increased availability of computers with faster speeds at much lower costs, the physics community has continued to push the frontiers of physics using computational techniques.

One of our Division's main challenges is to continue to help and encourage its members to focus on finding ways of discovering and understanding new physics through computational approaches. Recent changes in science policy and the fundamental changes taking place in many of the important industries have made

the climate quite challenging for all of physics and computational physics. For our voices to be heard we need a strong and effective organization. We must make sure that our Division is properly poised to be an effective advocate and communicator of the values and the needs of computational physicists. Our Division must communicate the great potential of computational approach to industries and how they can use this new technique as an experimental tool to study physical properties of a wide range of problems of technological interest. This will be particularly useful in the light of the current employment problems in the academic market and will serve to enhance the potential of computational physicists in bringing new expertise to industrial problems. If elected, I will use my position as the spokesperson of the Division to work for and promote the above goals.

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## Vice-Chair

### Barry M. Klein

*Professor of Physics and Department Chair  
University of California, Davis*

Barry M. Klein received his Ph.D. in condensed matter theory from New York University in 1969. From 1969-71 he had a postdoctoral research appointment at the Naval Research Laboratory. In 1971 he became a member of the NRL staff working in condensed matter and plasma physics on the theory of x-ray emission from laser-produced plasmas. In 1978 he became head of the NRL Electronic Structure of Solids Section and led a theoretical effort in electronic structure studies of a wide range of solid systems, with particular emphasis on fundamental investigations of superconducting properties and point defects. In 1984-85 he was Program Manager for Condensed Matter Theory and Acting Section Head for Condensed Matter Sciences at the National Science Foundation. Dr. Klein returned to NRL in 1985 and became Branch Head for Condensed Matter Physics, and supervised research in experimental x-ray physics, plasma spectroscopy and synchrotron radiation, in addition to theoretical condensed matter research. In 1989 Dr. Klein became Branch Head for the Complex Systems Theory Branch, leading a theoretical effort involving over 20 scientists engaged in studies of a wide range of condensed matter properties, from electronic structure theory, to many body theory, to atomic physics. In 1992 Dr. Klein became Professor of Physics and Chair of the Department of Physics at the University of California, Davis.

Barry M. Klein has been the recipient of a NASA undergraduate Fellowship and an NRC Postdoctoral Associateship. He has received many NRL awards including a Meritorious Civilian Service Award in 1992. He has served as Chair of the Peer Review Board of the NCSA and Pittsburgh Supercomputer Centers from 1988-91, and has been a member of numerous other NSF, DoD, and DoE Committees. He is currently on the High Performance Computing Advisory Board for Los Alamos and Oak Ridge National Laboratories; the Advisory Board for the Pennsylvania State Materials Research Laboratory; and the Executive Board of the journal *Modelling and Simulation in Materials Science and Engineering*.

Barry Klein's condensed matter research efforts have been in electronic structure theory and computer applications. He has published widely in the areas of superconductivity, defects, alloy theory, and magnetism. His current interests are in superlattices, quantum dots and wires, developing accurate model Hamiltonian methods, and formulating new electronic structure approaches for parallel computers.

### *Candidate's Statement*

My entire research career has been focused on using both theory and computation to solve problems in condensed matter physics, materials science, and computational chemistry. The combining of these three fields in one sentence is deliberate, since I would like to emphasize that many of our science and engineering disciplines have many overlapping computational goals and techniques. This commonality has been particularly apparent to me in my varied committee assignments and editorial service, and points up a very important, and practical, function of our organization — the bringing together of different, but related, research areas under a common organizational umbrella in the APS to serve our mutual interests. Important functions that we should perform include: promoting meetings that emphasize the synergisms that are present in our fields; lobbying the different funding agencies to support computational research; helping our research students and unemployed brethren to

find employment; working to create and promote new educational paradigms that meet the needs of students.

The field of computational research has shown huge growth in recent years (and is expected to continue), and with the expectation that we will become more and more of a “software society,” our Society and our Division will have to assume an increasing leadership role as a major representative of our common interests. My career, having traversed several generations of hardware and software, and my past service in the “computational infrastructure,” gives me a good perspective to help our Division meet the future challenges.

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## Member-at-Large

### Emily A. Carter

*Associate Professor of Theoretical Physical Chemistry  
University of California, Los Angeles*

Emily A. Carter earned her Ph.D. in Chemistry at Caltech in 1987, after receiving her B.S. degree in Chemistry from UC Berkeley in 1982. After a year’s postdoctoral appointment at the University of Colorado-Boulder, she joined the faculty at UCLA in 1988 as an assistant professor. She was promoted to associate professor with tenure in 1992. Her focus at UCLA has been to combine first principles electronic structure calculations with molecular dynamics and Monte Carlo simulations to accurately assess the microscopic energetics and dynamics of reactions occurring on metal and semiconductor surfaces and thin films.

Other research carried out in her group (currently composed of 6 graduate students and 3 postdoctoral fellows) includes prediction of electronic properties and reactivity of transition metal clusters, and well as an emphasis on development of new quantum and statistical theoretical techniques. She is the recipient of a National Science Foundation Presidential Young Investigator Award, a Camille and Henry Dreyfus Foundation Distinguished New Faculty Award, two Union Carbide Innovation Recognition Awards, a Camille and Henry Dreyfus Teacher-Scholar Award, an Alfred P. Sloan Research Fellowship, an Exxon Faculty Fellowship in Solid State Chemistry (American Chemical Society Award), and most recently she has been named the 1993 Medalist of the International Academy of Quantum Molecular Sciences. Dr. Carter is an author of over 60 papers and book chapters. She has given 33 invited lectures at national and international conferences and 44 invited seminars at universities, national laboratories, and industrial companies. She serves on the Editorial Boards of Molecular Simulation and Computer Physics Communications, and is on the Executive Committees of the American Vacuum Society Surface Science Division and of the American Chemical Society Physical Chemistry Division.

### *Candidate’s Statement*

The APS Division of Computational Physics should endeavor to reach out to other science and engineering disciplines that may or should have an interest in computational physics problems. If elected, I would help facilitate such connections, as indicated by the following suggestions. First, an on-line database of e-mail addresses should be constructed for those interested in our field, with short statements of current research efforts included beside each person’s name and e-mail address. Second, on-line advance abstracts in all journals related to computational physics (not just those produced by AIP, or perhaps all those except those abstracted by AIP) should be available by e-mail. Third, an on-line algorithm database (written in various languages or pseudocode) accessible by anonymous ftp should be set up. These are just a few of many possible ways to facilitate interactions across disciplines. I would be interested, as a member-at-large of the executive committee, in initiating these and other ideas, to enhance the cross-fertilization that will serve to accelerate advancements in our field.

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## Member-at-Large

**Robert Ehrlich**  
*Professor of Physics*  
*George Mason University*

Robert Ehrlich received his Ph. D. in Physics from Columbia University in 1964. From 1963 to 1966 he was a research associate at the University of Pennsylvania, doing elementary particle experimental work. He continued this work when he became an Assistant Professor at Rutgers University in 1966, where he remained until becoming Associate Professor at the State University of New York - College at New Paltz. He became Department Chair at SUNY New Paltz and left in 1977, when he joined the Physics Department at George Mason University, which he chaired until 1989. He has written a number of books, including "Physics and Computers" (Houghton Mifflin, 1973), "Waging Nuclear Peace," (SUNY Press, 1985), "Turning the World Inside Out," (Princeton University Press, 1990), and "The Cosmological Milkshake," (Rutgers University Press, 1994). He is currently one of three co-directors of the CUPS Project, an international team of 27 physicists who are developing computer software for use in teaching upper level undergraduate physics courses. He is also a Fellow of the APS.

### *Candidate's Statement*

Physicists have been in the forefront in using computers in their research, but they have in some cases not embraced computers in teaching undergraduate courses, apart from specific courses in computational physics. The Division needs to take a leadership role in promoting appropriate computer use throughout the undergraduate curriculum. It also needs to become involved in graduate educational efforts involving computational physics. As more new joint Ph. D. programs in computational physics are created it is important that the Division play a role in: helping to define what an appropriate curriculum might look like, serving as an information repository on what exists, and what is in the pipeline, and thinking about what such programs *should* look like.

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## Member-at-Large

**Karin M. Rabe**  
*Clare Boothe Luce Associate Professor of Physics*  
*Yale University*

Karin M. Rabe received her B.A. degree in physics at Princeton University in 1982 and her Ph.D. degree in physics from the Massachusetts Institute of Technology in 1987. From 1987 to 1989 she was a postdoctoral member of the technical staff at AT&T Bell Laboratories in Murray Hill, NJ. She is currently the Clare Boothe Luce Associate Professor of Applied Physics and Physics at Yale University, where she has been on the faculty since 1989. Her research interests include the theory of structural and electronic properties of complex crystals, first-principles total-energy calculations, structural phase transitions, quasicrystalline materials, ferroelectrics and the theoretical prediction of new materials.

### *Candidate's Statement*

Computation is a tool that should be as natural to all physicists as pencil and paper. All too often, however, computational skills are picked up piecemeal. One important purpose of the Division is to promote the integration of computation into the undergraduate and graduate physics curricula, not only through special computational physics courses but also by encouraging the development of materials, for courses in all topics and levels, which can be used by instructors unwilling or unable to develop a computational component for the course from scratch.

At the research level, attention must be given to developing means for wide dissemination of current information about computer resources, including hardware and software. This is particularly important as

emphasis shifts to desktop computing, since important purchasing and system setup decisions are being made by individuals, often on the basis of limited knowledge or hearsay.

Finally, computational physics is special in that it is centered around a body of technique of common interest to workers in all traditional fields of physics. In consequence, cross-disciplinary interactions occur much more frequently. This is healthful not just for the development of computational techniques, but for physics as a whole.

An important goal of the Division is to find ways to facilitate these interactions, counteracting the tendency to ever-narrowing specialization, while promoting groundbreaking progress in the application of computers to physics.

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**Member-at-Large**

**Richard T. Scalettar**  
*Associate Professor of Physics*  
*University of California, Davis*

Richard T. Scalettar received his PhD in physics from the University of California, Santa Barbara in 1986. His thesis work, under the supervision of Profs. Douglas Scalapino and Robert Sugar, was on developing algorithms to simulate systems of large numbers of correlated electrons. After a post-doctoral appointment with Prof. Peter Wolynes in the Chemistry Department at the University of Illinois, Urbana-Champaign, he joined the faculty at the University of California, Davis, in 1989, where he is now an associate professor. His research focuses on using Quantum Monte Carlo techniques to describe the magnetic and superconducting properties of interacting electron and electron-ion systems.

*Candidate's Statement*

In an era of increasingly competitive funding, computational physics has, in principle, the potential to benefit from special agency initiatives aimed at advanced scientific computing. In practice, these resources have proven nontrivial to access. One of my primary concerns will be to promote at these agencies the recognition that computational scientists, as much as computer scientists, have driven progress in our ability to solve forefront problems using the most modern machines. Lattice gauge theorists, for example, were among the initial and most successful users of the first generation of array processors, exposing the strengths and weakness of these machines, and even developing software for them. Similar statements can be made today concerning parallel processing. As practiced consumers of advanced computing resources, as well as educators of significant numbers of students who go out into the computer industry, a case needs to be made that some portion of these initiatives should fund the research of computational physicists.

Many academic institutions, and the University of California in particular, are struggling with the issue of balancing research and teaching. At the same time, many funding agencies are most significantly increasing their allocations in education-related areas. I believe it is possible to work with these trends by promoting undergraduate opportunities in research. Computational physics has unique advantages here, both because of the conceptually simple nature of some of its algorithms, as well as a consequence of the well-justified interest undergraduates have in developing their skills with computers. A number of our members have been active in developing these possibilities. I would like to ensure that these resources are easily and broadly available, as well as exploring the availability of funding opportunities in these areas.

## BALLOT

**Vice-Chair:** Vote for one candidate.

- Fereydoon Family
- Barry M. Klein

**Members-at-Large:** Vote for two candidates.

- Emily A. Carter
- Robert Ehrlich
- Karin M. Rabe
- Richard T. Scalettar

Please return your ballot in the envelope provided. It must be received on or before April 15, 1994 for it to be counted.