THANK YOU

to the many people who made SC2003 possible
About SC

SC2003 continues the 15-year Supercomputing Conference tradition of highlighting the most innovative developments in high-performance computing and networking. Bringing together scientists, engineers, researchers, educators, programmers, system administrators and managers, SC2003 in Phoenix will demonstrate how these developments are sparking new ideas and new industries, as well as rekindling older ones. The conference features the latest scientific and technical innovations from around the world while its SC Global events will showcase achievements in the arts and sciences among dozens of remote locations.

SC2003 will feature presentations and exhibits of the latest technological developments in fields such as information architectures, data storage, analysis and visualization, optical networking, scalable computing applications and distributed systems. SC Global, which debuted at SC2001, will return to provide interactive access to audiences around the world. New in 2003 will be the tight integration of SC Global and the on-site SC program, allowing both more input to SC from remote sites and a wider distribution of presentations from the conference.

Plan now to be a part of SC2003 and its program of trailblazing technical papers, timely tutorials, invited speakers, up-to-the-minute research posters, and provocative birds-of-a-feather sessions. Exhibits from industry, academia, and government research organizations will demonstrate the latest innovations in computing and networking technology. The SC Global Showcase will offer a glimpse of how these capabilities can ignite imaginations in non-traditional fields. SC2003 promises to be the most exciting, innovative, hottest conference yet!

Problems with this page? Please contact our webmaster.
## SC2003 Committee List

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<thead>
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<th>2003 Role</th>
<th>Last Name</th>
<th>First Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Chair</td>
<td>McGraw</td>
<td>James R.</td>
<td>Lawrence Livermore National Laboratory</td>
</tr>
<tr>
<td>Conference Vice-Chair</td>
<td>Duke</td>
<td>Dennis</td>
<td>Florida State University</td>
</tr>
<tr>
<td>Conference Deputy Chair</td>
<td>Huskamp</td>
<td>Jeff</td>
<td>East Carolina University</td>
</tr>
<tr>
<td>Conference Deputy Chair</td>
<td>Kramer</td>
<td>Bill</td>
<td>Lawrence Berkeley National Laboratory</td>
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<tr>
<td>Conference Committee, ACM Representative</td>
<td>Baglio</td>
<td>Donna</td>
<td>ACM</td>
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<tr>
<td>Conference Committee, IEEE CS Representative</td>
<td>Kelly</td>
<td>Ann Marie</td>
<td>IEEE Computer Society</td>
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<tr>
<td>Conference Committee, Executive Director</td>
<td>Borchers</td>
<td>Bridget</td>
<td>R. R. Borchers and Associates</td>
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<tr>
<td>Conference Committee, Committee Support</td>
<td>Bianchini-Gunn</td>
<td>Michele</td>
<td>Lawrence Livermore National Laboratory</td>
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<tr>
<td>Finance Chair</td>
<td>Teller</td>
<td>Pat</td>
<td>University of Texas, El Paso</td>
</tr>
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<td>Finance Deputy Chair</td>
<td>Huskamp</td>
<td>Sandra W.</td>
<td>East Carolina University</td>
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<tr>
<td>Finance Contractor</td>
<td>Ford</td>
<td>Ethel</td>
<td>Capstone Solutions Inc</td>
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<tr>
<td>Exhibits Chair</td>
<td>Cooper</td>
<td>David</td>
<td>Lawrence Livermore National Laboratory</td>
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<tr>
<td>Exhibitors Forum Chair</td>
<td>Papadopoulos</td>
<td>Phil</td>
<td>San Diego Supercomputing Center</td>
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<td>Ginny</td>
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<td>Exhibits Committee, Industry Exhibits Co-Lead</td>
<td>Marshburn</td>
<td>Ernie</td>
<td>East Carolina University</td>
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<tr>
<td>Exhibits Committee, Industry Exhibits Co-Lead</td>
<td>Verastegui</td>
<td>Becky</td>
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WELCOME

Sponsors

The SC conference series is sponsored by the Association for Computing Machinery Special Interest Group for Architecture (ACM SIGARCH) and the Institute of Electrical and Electronics Engineering (IE Computer Society).

http://www.acm.org/sigarch/

http://computer.org

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Through its relatively short history, SC has highlighted some of the most important innovations of the information age, including the birth and growth of the World Wide Web, the development of massively parallel, distributed shared memory, and cluster supercomputers, and the growth of distributed computing and collaboration using grids. The first SC conference (then called Supercomputing) convened in Orlando, FLA, in 1988, when peak performance was an "impressive" 3 gigaflops. Fifteen years later as the conference prepares to meet in Phoenix, teraflops-level machines are becoming the norm, Linux commodity clusters are redefining high performance computing, innovators are unearthing insights from terabytes of data, and sophisticated scientific tools, applications, and display systems are available worldwide through grid technologies. It's been a long, interesting, and sometimes unpredictable journey, SC and for the community it serves. This section includes information on past conferences and on the conference series in general.

Problems with this page? Please contact our webmaster.
Contact Information

Want to know more about a specific program or activity planned for SC2003? Committee members for the following areas can be contacted using the appropriate e-mail address:

Technical Papers
papers03@sc-conference.org

Panels
panels03@sc-conference.org

Tutorials
tutorials03@sc-conference.org

Workshops
workshops03@sc-conference.org

Masterworks
masterworks03@sc-conference.org

Posters
posters03@sc-conference.org

Birds-of-a-Feather (BOF) Sessions
bofs03@sc-conference.org

SC Global
scglobal03@sc-conference.org

Education Program
education03@sc-conference.org

Industry Exhibits
industry-exhibit03@sc-conference.org

Research Exhibits
research-exhibit03@sc-conference.org

HPC Challenge
hpc-challenge03@sc-conference.org

Bandwidth Challenge
bw-challenge03@sc-conference.org

SCinet
scinet03@sc-conference.org

Student Volunteers
About SC2003 Logo

About the SC2003 logo: “Firebird” was created by David Moreno, a student at the Institute for America Indian Arts in Santa Fe, and was selected as the winning design in a competition to create a symbol for SC2003. In the culture of Moreno’s Pascua Yaqui tribe of Arizona, birds are messengers of the spirits. A depiction of this mythological firebird is derived from the hummingbird and from the Meso-American feathered serpent god Quetzalcoatl.
Awards and Prizes

Read the most up-to-date information for the Technical Program (www.sc-conference.org/sc2003/inter_cal).

SC2003 presents a wide range of awards that recognize the innovative hard work of conference participants and leaders in the field. The conference itself gives awards for Best Paper, Best Student Paper, Best Poster, and the HPC Challenge and Bandwidth Challenge. The Gordon Bell Prizes reward practical uses of high-performance computers, including best performance of an application and best achievement in cost-performance. The Seymour Cray Computer Science and Engineering Award recognizes innovative contributions to high-performance computing systems that best exemplify the creative spirit of Seymour Cray. The Sidney Fernbach Memorial Award honors innovative uses of high-performance computing in problem solving. These prestigious honors are presented during a special ceremony – which is open to all attendees – held as a capstone to the SC conference on Thursday afternoon.

Fred Johnson, SC2003 Awards Lead

Problems with this page? Please contact our webmaster.
Overview

Read the most up-to-date schedule for the Technical Program at (/sc2003/inter_cal/).

The SC2003 Technical Program is the centerpiece of the conference’s scientific content. This is where we hope to "Ignite the Imagination" of attendees.

This starts with our invited presentations, including the Keynote by Donna Cox. (Note that the keynote is open to exhibitors and exhibits-only pass holders as well as technical program attendees – don’t miss it! A great talk!) Also, the popular State-of-the-Field talks continue this year, with topics ranging from biology through engineering to networks.

The refereed Technical Papers will present the highest-quality research in a variety of areas. This year papers were selected from 207 submissions in such areas as algorithms & programming models; computer/communication systems & input/output; Grid computing & networking; performance analysis tools; and software systems & visualization/collaboration.

Tutorials will also be high quality, but aimed at teaching the theory and practice of supercomputing. The unprecedented number of submissions this year resulted in a wide variety of topics taught. We are particularly excited this year by the inclusion of hands-on tutorials, letting attendees try out what they’ve learned on classroom workstations or their own laptops.

Posters, which are also selected from dozens of submissions, provide a forum for ideas and results in high-performance computing and networking that are not yet developed into a full paper. These posters will be on display Tuesday through Thursday, including a reception on Tuesday evening.

For the more practical-minded, there will be invited Masterworks talks focusing on real-world projects in areas of renewable energy and earth systems, HPC infrastructure, life sciences, and new technologies.

Several day-long Workshops will examine special areas in great depth. The Grid2003 workshop – the latest in the Grid Computing Workshop series – hosts a refereed set of presentations on distributed computing (Note that there is an extra registration fee for this meeting.) Other workshop topics include PetaFLOP$^2$ Programming and HPC I/O.

Some areas are just too big – or controversial – to be covered by one speaker, so we will also have Bird-of-a-Feather sessions to encourage discussions and Panels to debate the issues. Highlights this year include sessions on several ongoing studies of supercomputing and the all-new Battle of the Network.

SC2003 will also mark the return of SC Global, the first (and, so far, only) truly global conference. SC Global will use the collaboration capabilities of the Access Grid – itself an outgrowth of high-performance networking research – to link sites around the world into activities, including the SC Global Showcase. Sites on 4 continents will be making presentations, and over three dozen other sites on five continents join as Satellite Sites. This year, submissions were peer-reviewed for both content merit (artistic, scientific, or both) and technical feasibility. The selected submissions ranged from systems for engineering desig
Tech Papers

With the SC2003 Conference theme of Igniting Innovation, the words of Louis Pasteur have special meaning for the SC2003 Technical Papers program: "Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world." The SC2003 Technical Papers program brings together innovative and important new work in high-performance computing and networking from over fifty academic, government, and corporate institutions across five continents. Sixty papers have been selected for presentation from 207 submissions. The papers span theory and practice, modeling and experimentation, and infrastructure and application. Modeling and visualizing earthquakes, services for grids and clusters, and optimization of computer and network architectures are just a few of the topics reported on.

The program is presented in twenty sessions over three days. Sessions on cluster-based servers, tool infrastructure, and compilation techniques start the week, while sessions on high-performance input/output and performance measurement end the week. In between, program participants have a broad cross-section of work to choose from. Awards are given for best technical paper and best student paper. The first pair of sessions includes two of the papers nominated for best student paper. The last session includes one of the papers nominated for best technical paper. In all, six papers are candidates for best technical paper, and five for best student paper. Twenty student papers were accepted from 74 submissions. The Technical Papers program highlights two Gordon Bell Prize sessions. The Technical Papers program is part of the larger SC2003 Technical Program including tutorials, posters, invited speakers, panels, BOFs, workshops, and SC Global.

The Technical Papers program is the culmination of many individual and group efforts. Special thanks goes to the Technical Papers Committee listed below. The quality of the program is a testament to their commitment to the paper review process. The Area Chairs deserve special note, as the process would have worked without them. In addition to the committee, over fifty referees contributed their time and expertise. Thanks, too, to the SC2003 Technical Program Committee and other conference committees that support tech papers in myriad ways, from the submission/review website to student volunteers at the conference. Finally, thanks to the authors for contributing to an exceptional program.

We welcome your participation in the SC2003 Technical Papers program.
Let it spark your imagination!

Diane Rover, SC2003 Technical Papers Chair
Barton Miller, SC2003 Technical Papers Vice Chair

List of papers by author
Tutorials

In the tutorial component of SC2003 leading experts present full-day or half-day instructional sessions on topics that enhance knowledge, improve skills, and generate new ideas and opportunities.

This year’s tutorial program is especially strong and vibrant. Twenty-eight tutorials were selected from a unprecedented 101 submissions. The international jury of specialists that created this year’s program ensured a mixture of courses that will help attendees develop higher skill levels on topics directly related to their jobs and offer a glimpse of new and exciting technologies.

Included are tutorials on network security, performance measurement and modeling, high-performance storage and I/O, and programming tools and languages such as MPI, Python, UPC, Co-Array Fortran, OpenMP. Given the growing importance of distributed computing, a key focus will be tutorials on building and administering grids, using TeraGrid, high-performance data transport, and distributed/collaborative visualization. New technologies covered include the Lustre filesystem, customer-owned fibre-based networks, energy conservation techniques for servers, and, in a unique attempt to peek "over the horizon" quantum information processing.

Note that tutorials are not included in the basic Technical Program registration. To attend tutorials, you must purchase the One- or Two-day Tutorial Passport which allows you the flexibility to attend multiple tutorials on the day(s) of the Passport. One set of notes and a luncheon per day are included in the Passport. You can purchase additional sets of notes on site. Some tutorial instructors also plan to provide CDs with software and other materials to their attendees.

New for SC2003 will be a selection of "hands-on" tutorials offering attendees training using pre-prepared demos and exercises during the tutorial using either local or remote supercomputing resources. Some of these tutorials will use a laboratory equipped with a limited number of workstations and seating will be on a first-come, first-served basis. Please be sure to arrive early for the courses you wish to attend. Note that the hands-on tutorials allow you to participate using your own wireless-enabled laptop computer however, there may be tutorial-specific software that you must install on your own prior to the tutorial. Requirements are listed in the abstracts for each tutorial. Please study them carefully, since there will be software support available during the tutorials.

Many thanks are due to the members of the Tutorials Committee (whose names appear at the bottom of this page) and to the Program Committee, who worked so hard to bring this year’s tutorial program together. Thanks, too, to all the presenters who have created such an exciting program. Join us!

Harvey J. Wasserman, SC2003 Tutorials Chair
Mary Kay Summers Bunde, SC2003 Tutorials Vice-Chair

### Tutorials Schedule

<table>
<thead>
<tr>
<th>Date</th>
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<th>Session:</th>
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Keynote and State-of-the-Field Talks (Plenaries)

SC2003’s plenary speaker program provides an unparalleled opportunity to hear and talk with some of the leaders in the field.

Opening the technical portion of the program on Tuesday, Nov. 18, will be keynote speaker Donna Cox, full professor in the School of Art and Design at the University of Illinois at Urbana-Champaign who has held a joint appointment with the National Center for Supercomputing Applications since 1985. A renowned expert on computer visualization, Cox has authored many papers and monographs on computer graphi information design, education and scientific visualization. She has exhibited computer images and animations in more than 100 invitational and juried exhibits in the past nine years, and her work has appeared on international television, including NOVA, CNN, and NBC Nightly News. Her talk on “Beyond Computing: The Search for Creativity” brings together the high technology of computational science, the high innovation of the arts and humanities, and the high creativity needed to address the really big questions, from understanding the universe to enriching the human condition.

Read the abstract for Cox’s talk, entitled, “Beyond Computing: The Search for Creativity”

Read a short biography for Donna Cox

Four high performance computing (HPC) leaders will describe the state of the field in subsequent plenary sessions.

- Judy Estrin, Chairman of Packet Design Inc. and co-founder of three tech firms, will answer the question “Is There Anything New on the Networking Horizon?” Of course, the answer is a resounding “yes”, from improving operational efficiency on critical infrastructures to enabling new forms of entertainment with always-on high bandwidth.

- David Culler, Professor of Computer Science at the University of California, Berkeley and renowned researcher in many areas of computer science, will focus on “Networking the Physical World.” His description of sensor networks – from basic hardware through self-organizing network topologies – clearly shows their potential to advance the scientific endeavor.

- Frieder Seible, founding Chair of the Department of Structural Engineering and currently Dean of Engineering and Professor of Structural Engineering at the University of California, San Diego, will discuss the “Physical Infrastructure Assessment and Protection to Mitigate Natural and Man-made Disasters.” In other words, how can today’s (and tomorrow’s) cyberinfrastructure help solve important problems like earthquake damage control?

- Jill Mesirov, Chief Information Officer and Director of Bioinformatics and Computational Biology at the Whitehead Institute/MIT Center for Genome Research, will give a presentation on “Computational Paradigms for Integrative Approaches to Genomic Medicine.” Her vision of infrastructure-enabled biology covers both the most challenging problems in biomedicine today and the ways that computation is being used to solve them.
TECHNICAL PROGRAM

Panels

The SC2003 technical program includes ten panels for presenting and discussing diverse points of view on timely topics. This includes one panel held in conjunction with SC Global, enabling worldwide participation. Panels are designed to allow audience participation in the discussion and to allow the audience to ask questions as well as hear the opinions of experts in the field.

All Friday morning panels are open to ALL SC03 registered attendees, exhibitors as well as technical program registrants. We sincerely hope that many of you who are not registered for the technical program will stay the extra day to participate in these panel discussions.

Panelists for the selected panels include high-ranking government officials, industry leaders and academics who are leaders in their fields. The panels not only address the current, state-of-the-art practices and technology but also project future trends going out to 2010 and beyond. Topics of discussion include HPC architecture, networking, benchmarking, government policies and open source software.

A few questions to be addressed by this year’s panelists include

- How will network infrastructure change to tackle the data tsunami that is coming this decade?
- What metrics should be used to define and measure High End Computing performance and what are the implications for computer designers and users?
- What are the High End Computer Revitalization Task Force (HECRTF) results to date; how did they gather data; how do academia and industry view of the study?
- What are the best practices and lessons learned to date by the Open Source Software community?
- What is the long-term potential of the current crop of leading HPC architectures?

Robert Borchers, SC2003 Panels Chair
David Morton, SC2003 Panels Vice-Chair

Panels Schedule

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<th>Date</th>
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<th>End Time</th>
<th>Rm #</th>
<th>Session:</th>
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<tbody>
<tr>
<td>11/19</td>
<td>1:30PM</td>
<td>3:00PM</td>
<td>6-10</td>
<td>Where Should the Access Grid Go After Version 2.0</td>
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<td>Speakers/Presenters: Joyce F. Williams-Green (Winston-Salem State University), Ian Foster (Argonne National Laboratory), Daniel A. Reed (NCSA/Alliance), Ulrich Lang (High Performance Computing Center Stuttgart (HLRS))</td>
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<tr>
<td>11/19</td>
<td>3:30PM</td>
<td>5:00PM</td>
<td>40-41</td>
<td>SuperNetworking, Transforming Supercomputing</td>
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**Posters**

Please plan some time to visit the SC2003 Research Posters Area in Lobby Two of the Convention Center. This part of the technical program is designed to showcase innovative research in progress. Our call for poster submissions yielded 119 high quality submissions. From this impressive group the Posters Committee accomplished the difficult task of selecting 44 submissions for display as Research Posters. Represented topics include networking, grid technologies, and domain specific uses of technology. Posters will be on display all day Tuesday through Thursday. One poster will be chosen during the conference for the Best Poster Award.

Posters exhibitors will be on hand to discuss their research at the Posters Reception on Tuesday, November 18, from 5:00 to 7:00 pm in Lobby Two. We hope you can join us for this lively mix of wine, cheese, and ideas.

We’d like to extend our thanks to the Poster Committee Members and Referees, and to AMD for their generous sponsorship of this year’s Posters Reception.

Michelle Hribar, SC2003 Posters Co-Chair  
Karen L. Karavanic, SC2003 Posters Co-Chair

| Posters Schedule |
|-------------------|------------------|-----------------|-----------------|-----------------|
| **Date** | **Start Time** | **End Time** | **Rm #** | **Session:** |
| 11/18 | 10:00AM | 5:00PM | Lobby 2 | Posters on Display |
| **Speakers/Presenter:** | | | | |
| 11/18 | 5:00PM | 7:00PM | Lobby 2 | Poster Reception |
| **Title:** | Poster Reception |
| **Speakers/Presenter:** | | | | |
| 11/18 | 5:01PM | 7:00PM | Lobby 2 | Poster Reception |
| **Title:** | A Performance Comparison of Sorting Algorithms in Unified Parallel C |
| **Speakers/Presenter:** | Ronald Brightwell (Sandia National Laboratories), Jonathan Leighton Brown (Sandia National Laboratories), Su Goudy (Sandia National Laboratories), Zhaofang Wen (Sandia National Laboratories) |
| 11/18 | 5:01PM | 7:00PM | Lobby 2 | Poster Reception |
| **Title:** | A Proposed Standard for Matrix Metadata |
| **Speakers/Presenter:** | Victor Eijkhout (University of Tennessee), Erika Fuentes (University of Tennessee) |
Masterworks

Masterworks are invited presentations that highlight novel and innovative ways of applying advanced computing and communications technology to solve challenging, real-world problems. That is, they show the practical side of igniting innovation in supercomputing, and the real difference it can make for companies and the general public. The focus is on how recent developments in computational methods changing the ways that business and science are carried out. This always makes the talks interesting, relevant, and memorable.

This year we are proud to have an exceptionally strong slate of Masterworks talks, with talks from lead industry and important application users. Our presentations follow four themes, each of interest to a substantial part of the SC2003 audience:

- **Renewable Energy and Earth Systems.** (Tuesday and Wednesday mornings) Although weather forecasting has been a driving application for high-performance computing for decades, it is no means the only computationally intensive study of earth systems. For example, Edward Hall from General Electric Global Research Center will discuss "Computing a Renewable Energy Future", an issue of great importance to both society and the planet.

- **High Performance Computing Infrastructure.** (Tuesday afternoon) Despite much work, it's hard to get the best performance out of your computers, with issues ranging from data management to supercomputer architectures. Fortunately, there are success stories that you can study. For example, Pete Bradley describes "Ten Years on the Grid – Production Design Using Large Scale Grid Computing at Pratt and Whitney".

- **New Technology.** (Wednesday afternoon) What will the future of supercomputing look like? Steve Chen (formerly of Cray and now at Panta Systems) and Susan Graham (UC Berkeley) have two answers to that question. Come see who you agree with. Plus, we have a session on the emerging field of nanotechnology.

- **Bio-informatics and Life Sciences.** (Thursday morning and afternoon) From identifying and tracking genes to understanding how the brain works, biology is in the midst of a revolution. Computers play a key part in this, from collecting the data to making sense of it. For example, Anton Koning of SARA Computing and Networking Services shows "VR Applications for Mining Genomics Data."

Masterworks presentations are in room 16-18, near Lobby 1. We hope to see many of you there for what promises to be a great show.

John Sopka, SC2003 Masterworks Co-Chair
Beverly Clayton, SC2003 Masterworks Co-Chair
## Birds-of-a-Feathers (BOF) Sessions

Birds-of-a-Feather (BOF) sessions allow people to discuss topics of mutual interest. SC2003 is providing meeting room facilities for the BOFs, which are open to all conference attendees, including exhibitors and exhibits-only badge holders.

A variety of subjects are up for discussion, ranging from HPC hardware to HPC applications and HPC community issues. Highlights include a town hall meeting on the future of supercomputing; a forum on collaborations among the humanities, arts, sciences, and technology; a discussion of HPC innovation for nanotechnology; and various user group meetings.

Please keep your lunchtime and early evening schedules free so that you can join other SC2003 participants to discuss opinions on topics that are important to you. SC2003 will post a daily schedule for the BOFs.

Lois Curfman McInnes, SC2003 Birds-of-a-Feather Lead
Lea Jenkins, SC2003 Birds-of-a-Feather Vice Lead

### Birds-of-a-Feathers (BOF) Schedule

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<tr>
<td>11/18</td>
<td>12:00PM</td>
<td>1:00PM</td>
<td>16-18</td>
<td>An Introduction to NFS v4</td>
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<td>Speakers/Presenter: Geoff Barrall (BlueArc Corporation)</td>
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<tr>
<td>11/18</td>
<td>12:00PM</td>
<td>1:00PM</td>
<td>36-37</td>
<td>Cray X1 Programming Environments and Experiences</td>
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<td>Speakers/Presenter: Guy Robinson (ARSC/CUG)</td>
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<td>38-39</td>
<td>HPC Innovation for Nanotechnology</td>
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<td>Speakers/Presenter: Tetsuya Sato (Earth Simulator Center), David Tomanek (Michigan State University), David Kahaner (Asian Technology Information Program), Hisashi Nakamura (RIST)</td>
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<tr>
<td>11/18</td>
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<td>40-41</td>
<td>PAPI Users Group</td>
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<td>Speakers/Presenter: Dan Terpstra and Phil Mucci (University of Tennessee)</td>
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<td>11/18</td>
<td>12:00PM</td>
<td>1:00PM</td>
<td>42-43</td>
<td>Safety in Numbers: Linux Clustering</td>
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<td></td>
<td>Speakers/Presenter: Matt O'Keefe (Sistina Software, Inc.)</td>
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Grid 2003

Read the most up-to-date information for the Technical Program (www.sc-conference.org/sc2003/inter_cal/).

GRID 2003 is an international meeting that brings together the grid community of researchers, developers, practitioners, and users. The objective of the workshop is to serve as a forum to present current and future work as well as to exchange research ideas in this field. GRID 2003 will have a special focus on grid applications.

The workshop will be held Monday, November 17, in the Wyndham Phoenix (formerly Crowne Plaza), 1 Adams Street, Phoenix, AZ, USA. This hotel is approximately 1 block from the Phoenix Convention Center. Note that this workshop will require additional registration when you sign up for SC2003! For more details about the workshop see http://www.gridcomputing.org/grid2003/.

Problems with this page? Please contact our webmaster.
Awards and Prizes

Read the most up-to-date information for the Technical Program (www.sc-conference.org/sc2003/inter_cal).

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Fred Johnson, SC2003 Awards Lead

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Workshops

A set of focused workshops has been selected to complement the other components of the technical program at SC2003. These workshops will give the participants opportunity for more in-depth and interactive discussion of important issues.

Unless otherwise noted, all workshops are held in the Phoenix Convention Center (site of the main SC2 conference) and are open to all Technical Program registrants.

- **The 4th International Workshop on Grid Computing (Grid2003)** will be held in the Navajo Room at the Wyndham Phoenix (just two short blocks from the Phoenix Convention Center) on Monday, November 17, 2003. Grid 2003 is an international meeting that brings together the Grid community of researchers, developers, practitioners, and users. The objective of Grid 2003 is to serve as a forum to present current and future work as well as to exchange research ideas in this field. Grid 2003 partially follows the focus from last year but extends it to production Grids and international testbeds. Note that because of extra arrangements associated with the Grid2003 workshop there is an additional registration fee. Please choose that option when you register for the conference if you will attend Grid2003.

- **The First Advanced Topics Workshop on Desktop Grids (DGRID)** will be held in the Curtiss room at the Hyatt Regency Phoenix (just across the street from the Phoenix Convention Center) on Monday, November 17, 2003. This is an advanced discussion of emerging issues in Desktop Grid computing. Note that due to space limitations, attendees of DGRID must register at http://www.csag.ucsd.edu/DGRID03/ before the workshop.

- **Petaflops Programming: Parallelism, Pain, and Perverse Programming Paradigms** will be held in the Phoenix Convention Center on Tuesday, November 18, 2003. This three-part workshop will examine architectural trends and the shape of probable architectures at the beginning of the petaflops era; evolving programming models and the way language and compiler developers will address challenges posed by petaflops architectures and how current users of high-end architectures respond to materials presented in the workshop and identify challenges in exploit petaflops architectures.

- **HPC I/O Workshop - Storage on the Lunatic Fringe: Beyond Peta-Scale Storage Systems** will be held at the Phoenix Convention Center on Wednesday, November 19, 2003. This workshop will help paint a picture of the current and future application requirements that significantly push the envelope of storage systems and the concepts, architectures, and technologies being developed to meet these requirements.

- **5th International APART Workshop on Automatic Performance Analysis** will be held in the Phoenix Convention Center on Friday, November 21, 2003. This workshop will give an overview of the APART specification language, test suite and Standardized Intermediate...
TECHNICAL PROGRAM

OVERVIEW | TECHNICAL PAPERS | TUTORIALS | PLENARIES | PANELS | POSTERS | MASTERWORKS
BOFs | GRID 2003 | AWARDS & PRIZES | WORKSHOPS | SC GLOBAL | HPC CHALLENGE
MSI PROGRAM | BANDWIDTH CHALLENGE

SC Global

Schedule

Primer

Technology Hubs and Partners

Committee and Review Team

Constellation and Satellite Sites

The SC Global 2003 program has two major thrusts: the content of the presentations and the technology required to produce the geographically distributed program. SC Global 2003 will feature presentations by speakers from 20 remote locations, 7 countries, and 5 sovereign tribal nations, distributed across 4 continents. We will link the Phoenix Civic Plaza Convention Center with Access Grid™ nodes worldwide.

All SC Global 2003 activities will be open to all conference attendees, including those with Exhibitor and Exhibits-only badges. In addition, there will be participation from Global Satellite Sites and Observer Sites. Global Satellite Sites will provide audience interaction from around the world, while Observer Sites will participate for passive viewing.

SC Global Presentation Content

SC Global 2003 plans to present a very dynamic technical program through a combination of panel discussions, Birds of a Feather meetings and showcases events. One goal of this portion of the technical program is to demonstrate how the Access Grid (AG) brings together the right people and the right data at the right time in order to perform a complex task, solve a difficult problem or simply discuss issues that are pressing at that moment in time. To this end, the program contains:

- A demonstration of the use of the AG across geographically remote locations in virtual prototypes to increase productivity, turnover and customer satisfaction in engineering designs
- A demonstration of an interactive session over the Tribal Virtual Network (a consortium of Native American tribal museums and education centers)
- BoFs on ways to increase representation and participation of underserved peoples and communities in high performance networking and computing and on exploring the human and social needs of advanced collaborative environments
- Panel discussions on the future of the AG with some of the top thinkers in the grid community, on artistic and cultural instincts of using collaborative technologies
- A presentation of ways that live running simulations can be integrated into the AG
- An exploration of transpacific synergistic entertainment from sites with different cultures and attitudes towards entertainment
- And lots more!!

SC Global strongly encourages participating nodes to use version 2.1.1 (or later) of AG Toolkit (AGTk)
TECHNICAL PROGRAM

OVERVIEW  TECHNICAL PAPERS  TUTORIALS  PLENARIES  PANELS  POSTERS  MASTERWORKS
BOFs  GRID 2003  AWARDS & PRIZES  WORKSHOPS  SC GLOBAL  HPC CHALLENGE
MSI PROGRAM  BANDWIDTH CHALLENGE

HPC Challenge

The HPC Challenge Awards will honor participants in two categories for innovative uses of high performance computing resources. This will provide opportunities for contestants to showcase applications and platforms. Judging by a panel of experts will take place when entry teams present the results of the project at a special session. The categories are as follows:

Most Innovative Data-Intensive Application: With the increasing ability to create, store, and re-access larger and larger datasets, one thing remains constant: the importance of mining such data to glean us pieces of knowledge. The award will be presented to the entry that uses the most novel and/or inventive approaches in mining data, visualizing data, or a combination of these tasks.

Most Geographically Distributed Application: As the Grid continues to decrease the virtual distance between computers around the world, the ability to solve challenging computational problems with combinations of diverse system architectures is continuing to strengthen. The award will be presented to the team with the most geographically distributed application to solve a significantly complex problem.

Contestants will demonstrate their entries in front of an audience on Wednesday. Judges will make decisions on Wednesday afternoon, and awards will be presented at the Awards Session on Thursday.

Christine Cuicchi, SC2003 HPC Challenge Co-Chair
Radha Nandkumar, SC2003 HPC Challenge Co-Chair

HPC Schedule

<table>
<thead>
<tr>
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<th>End Time</th>
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<td>12:00PM</td>
<td>40-41</td>
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<tr>
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<tr>
<td>11/19</td>
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Minority Serving Institutions (MSI Program)

Read the most up-to-date information for the Technical Program (www.sc-conference.org/sc2003/inter_cal/).

Program Overview:
The purpose of this project is to increase the participation of minorities in the SC conferences by providing support to help faculty and/or IT professionals from Minority Serving Institutions (MSIs) - Hispanic Serving Institutions (HSIs), Tribal Colleges, and Historically Black Colleges and Universities (HBCUs) to attend the conference. It is our intention in providing these grants to improve our ability to reach groups that have traditionally not had access to high performance computing. IEEE and ACM fund the SC MSI Participation Grant. The intended impact of this project goes beyond just increasing the numbers of MSI participants in SC conferences to fostering collaborative relationships between faculty MSIs and research scientists at major research centers and impacting the amount and quality of computational science education at MSIs.

Through this program selected grant recipients will be invited to participate in either the Tutorials Program (11/16-17) (sc2003/tech_tutorials.html) or the Technical program (11/18-21) (sc2003/tech_over.html)

Grant Application Process:
To apply candidates should complete and submit the SC2003 MSI Grant Application Form by the May 32003 deadline. Please note that applicants must be either a US citizen or permanent resident in order to qualify for a grant. Applicants will be notified of their status via e-mail by June 30, 2003. Applications will be accepted until all slots are filled. /sc2003/tech_msiform.html

Selection Criteria:
The SC MSI Grant Program will select 45 participants. To be considered candidates:

- Must be a faculty or IT professionals from an MSI. (Student not eligible).
- Must be either a US citizen or permanent resident.
- Must be able to attend all MSI-related activities that include: an MSI Opening Session (11/16 @ 5:30 p.m.); Reception (11/18 @ 5:30 p.m.), and Birds of a Feather (BoF) discussion (11/18 @ noon).

Financing Participants:
Pending upon funding, up to 45 grants in the amount of $1,200 will be awarded to those selected to attend SC2003 in Phoenix, Arizona. The conference will be held in the Phoenix Civic Plaza Convention Center November 15-21, 2003. Individual grants will reimburse the cost of travel, lodging, and per diem up to $1,200. Expenses exceeding $1,200 will not be reimbursed. In addition to the $1,200 award, participants will be given a complementary Conference registration for either the Technical Program or Tutorials with one-day pass to the SC Exhibits Hall. The grant award is nontransferable. Grant recipients should allow to 8 weeks following the conference to receive reimbursement payment.
SCinet 2003 Bandwidth Challenge
Call for Participation

Continuing the tradition started at SC2000, SCinet and Qwest Communications are sponsoring the Fourth Annual High Performance Bandwidth Challenge. For the Bandwidth Challenge, applicants from science and engineering research communities across the globe will use the unique SCinet infrastructure to demonstrate emerging techniques or applications, many of which consume enormous amounts of network resources. At SC2002 in Baltimore, MD, Lawrence Berkeley National Laboratory captured the competition for the "Highest Performing Application" with a wide area distributed simulation using Cactus, Globus and Visapult software that demonstrated **a peak data transfer rate of 16.8 gigabits per second**, nearly 300,000 times faster than a Internet user with a typical 56K connection.

For SC2003, to be held in Phoenix, AZ November 15-20, 2003, applicants are challenged to significantly stress the SCinet network infrastructure while delivering innovative application value across the multiple research networks that connect to SCinet. For 2003, SCinet anticipates delivery of as many as four OC-192c wide area network interconnects to the Phoenix Convention Center. To support Bandwidth Challenge contestants, SCinet facilitates access to the networks, provides technical support to applicants, and makes arrangements for equipment and floor and rack space to applicants with demonstrable needs.

**Potential Contestants Must Submit Notification of Intent to Participate by July 18, 2003.**

Upon receipt of this notification of intent, SCinet will contact contestants with instructions on the content and format of the formal proposal. Full proposals must be received by August 8 to be included in the Conference Final Program.

The judging criteria for 2003 have been expanded to include:

1. Measurement of sustained TCP utilization
2. Quality of IPv6 implementation
3. Innovative features of non-stock TCP implementations
4. Applicability to the real world
5. Efficiency and effectiveness of multi-continent implementations
6. Improvement over previously demonstrated method
7. Quality of first time demonstrations

Qwest Communications is sponsoring the award of one or more monetary prizes for the applications that make the most effective and/or courageous use of SCinet resources. The primary measure of performance will be the verifiable network throughput as measured from the contestant's equipment through the SCinet switches and routers to external connections.

For more information, please send email to bwc@scinet.supercomp.org.
EDUCATION OUTREACH

Education Outreach

The SC conference series has a proud tradition of reaching out to faculty and students, providing opportunities through formal training sessions, meetings and volunteer programs. The SC2003 conference in Phoenix will offer the following educational outreach programs:

The Education Program: Follow this link to learn more about the SC2003 Education Program which engages undergraduate faculty and K-12 teachers in four days of hands-on workshops to learn about high performance computing and communications tools and resources appropriate for their classroom. The participants selected to participate in this program will learn about approaches to using modeling and visualization in the classroom, including numerical modeling, algebraic modeling, dynamic modeling systems, and agent modeling. The Education Program runs November 15-18, 2003 at the Phoenix Civic Plaza in Phoenix, Arizona. The deadline for applications is closed, but there will be other opportunities for educators to participate in similar programs through the National Computational Science Institute.

MSI Program: This program aims to increase the participation of minorities in the SC conferences by providing support to help faculty and/or IT professionals from Minority Serving Institutions (MSIs) attend the conference, as well as foster lasting collaborative relationships between faculty and the research community. The deadline for applications is May 30.

Student Volunteers: This program supports undergraduate and graduate students who volunteer to help with various aspects of the conference, including SCinet, media relations, exhibit setup and a host of other functions. Application deadline is September 30.

Student Day: Undergraduate and graduate students attend presentations about career opportunities in high-performance computing and networking, and receive guidance on how to apply and interview for jobs.

Contact information: education03@sc-conference.org

Problems with this page? Please contact our webmaster.

Overview

Industry Exhibitor Application

Since its inception, SC has established a tradition as the place for scientists, engineers, and managers see the latest in products, services, and innovations in high performance computing, networking and related disciplines, enabling them to return home with the tools they need to prepare their organizations the future. Now more than ever, they need to operate as effectively as possible, managing their financial and professional resources to best serve their communities. There is no other event that provides the depth and interaction in a wide range of fields such as information architectures, data storage, analysis and visualization, optical networking, scalable computing, scientific applications and distributed systems. Under the conference theme of "Igniting Innovation," industrial exhibitors will demonstrate the future of computing and networks from the desktop to petaflops.

Backed by the industry’s only focused conference program, the exhibit floor gives attendees the opportunity to obtain hands-on experience to back up the wealth of information gathered in the conference sessions. They’ll examine the impact of our changing society and growing global marketplace as well a breakthrough technologies for management and support. Conference attendees will search for the tools your products and services - that will allow them to implement this newfound knowledge on a local scale.

From the top of their field:

- 5% President/Owner/Vice President
- 10% Research Director/Management
- 22% Scientific/Research Staff
- 5% Computer Scientist
- 3% Programmer/Analyst
- 6% Systems/Software Engineer
- 5% Director/Manager Computer Center/Services
- 6% Engineering Management
- 5% Member of Technical Staff
- 3% Sales & Marketing Manager/Reps
- 13% Professor/Teacher
- 7% Other Management
- 9% All Other*

*Includes Consultants, Students, Other Engineers, Writers/Editors

From A Wide Range of Businesses:

Manufacturing
- 4% Aerospace
- 8% Computers and Related Equipment
SC Global 2003 Presentation Content

The SC Global 2003 program has two major thrusts: the content of the presentations and the technology required to produce the geographically distributed program. SC Global 2003 will feature presentations by speakers from 20 remote locations, 7 countries, and 5 sovereign tribal nations, distributed across 4 continents. We will link the Phoenix Civic Plaza Convention Center with Access Grid™ nodes worldwide.

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SC Global strongly encourages participating nodes to use version 2.1.1 (or later) of AG Toolkit (AGTk).
**HOTEL RESERVATIONS**

**Book rooms by Friday, Oct. 10 for guaranteed conference rate**

**SC2003 HOUSING INSTRUCTIONS & POLICIES**

Room reservations at conference hotels are handled on a first-come, first-served basis through the Greater Phoenix Convention & Visitors Bureau's (GPCVB) Housing Bureau. Information regarding locations, rates and amenities are located in the [Hotel Amenities Chart](#) and [Hotel Map](#). Reservations may be made by using the online “Passkey” reservation system (see below for details), or by completing the SC2003 [Conference Housing Form](#) (click here for downloadable version). Conference rates will not be given to persons who directly contact the hotels.

All hotels are in compliance with the Americans with Disabilities Act (ADA): guest rooms, common areas, meeting facilities and transportation services are within ADA requirements.

To make your reservation requests using the online “Passkey” system click here ([http://resweb.passkey.com/liveres/start.asp?e=8978](http://resweb.passkey.com/liveres/start.asp?e=8978))

This service is for individual room reservations only (roommates included). Exhibitors interested in reserving room blocks (10 or more rooms) or have special requirements regarding their reservations should contact Debbie Huszar, SC2003 Housing Coordinator for further assistance (see below for contact information).

**DEADLINE for Hotel Room Reservations** guaranteed at the conference rate: 4 p.m. Friday, October 10, 2003 (Mountain Standard Time).

Fax reservations to: 602-256-5292

Mail Housing Forms with Check Deposits: SC2003/GPCVB Housing Bureau  
(Make check payable to: SC2003 Housing Bureau) 400 E Van Buren St, Ste 600 Phoenix, AZ 85004-2 USA

For questions or concerns only, phone: 602-452-6262 (USA) or 602.452.6269 (Intl)  
Or email [hsgcoor@visitphoenix.com](mailto:hsgcoor@visitphoenix.com)

**FOR INFORMATION AND ASSISTANCE REGARDING BLOCKS, SUITES OR MEETING SPACE, PLEASE CONTACT:**

Debbie Huszar, SC2003 Housing Coordinator  
c/o Task Handlers, Inc  
Oregon City, Oregon  
503.722.2262  
info@taskhandlers.com

**DEPOSITS**

A guarantee by credit card valid through November 2003 or a check/money order deposit is required for the first night’s room and tax at the time of reservations. Deposit checks and money orders must be made out to “SC2003 Housing Bureau.” Total occupancy tax is 12.07% (subject to change). ALL ROOMS MUST BE GUARANTEED WITH A CREDIT CARD OR CHECK DEPOSIT OR YOUR RESERVATION WILL NOT BE MADE!
SCinet

SCinet, the state-of-art, on-site network designed and built especially for the annual SC conference, enables a rich environment for real-time demonstrations, communications, and collaboration. SCinet with applications developers who attempt demonstrations using most or all of the provided bandwidth. A high-speed network testbed provides access to major national networks and testbeds, and a virtual conference capability with international participants. As in prior years, an elite team of researchers, exhibitors, communications carriers, and networking equipment suppliers will work with talented volunteers from universities, government and industry to assemble and operate SCinet, making the SC2003 conference one of the best-connected sites on the planet.

SCinet Chair
Jim Rogers
Torch Technologies, Inc.

SCinet Vice Chair
Charles D. Fisher
Oak Ridge National Laboratory

SCinet Vice Chair
Jeff Mauth
Pacific Northwest National Laboratory

SCinet is the high-performance network built to support the annual International Conference for High Performance Computing and Communications (SC). The SC Conference Series is co-sponsored by SIGARCH and the IEEE Computer Society. SCinet features both a high-performance production-quality network as well as an extremely high performance experimental network, Xnet.

Volunteers from educational institutions, high performance computing centers, network equipment vendors, research networks, and telecommunication carriers work together to design and deliver the SCinet networks. Industry vendors and carriers donate much of the equipment and services needed to build the LAN and WAN infrastructure. Planning begins more than a year in advance of each SC conference and culminates with a high-intensity installation just seven days before the conference begins.

For SC2003, SCinet is providing direct wide area connectivity to Abilene, DREN, ESnet, and vBNS+, as many national and worldwide networks through peering relationships with these networks. Level (3) Communications is one of our most significant partners in 2003, delivering as many as four distinct OC-192c WAN circuits from Los Angeles and Chicago. Aggregate WAN connectivity delivered to the Industry and Research Exhibitors is expected to exceed 40 billion bits/second (Gbps). Qwest Communications is providing invaluable access to dark fiber in the Phoenix Metropolitan Area, high-bandwidth cross-connects to their national networks in Los Angeles and Chicago, and is sponsoring the Bandwidth Challenge for the fourth consecutive year.

Service Offerings
Wireless
**Dates to Remember**

**SC2003**
Phoenix Civic Plaza Convention Center, Phoenix, Arizona

**Conference Dates**
November 15-21, 2003

**Exhibition Dates**
November 17-20, 2003

**Dates To Remember**

**APRIL 7, 2003**
Website for submissions opens

**APRIL 25, 2003**
Research Exhibits Booth Selection process begins

**MAY 2, 2003**
Submission deadline for all SC Global categories (Showcase, BOFs, Panels, Papers)
Submission deadline for Gordon Bell Prize nominations
Submission deadline for Technical Papers
Submission deadline for Tutorials

**MAY 30, 2003**
Applications for Education Program due

**JUNE 8, 2003**
Submission deadline for Panels

**JUNE 27, 2003**
Notification of conditional acceptance for all SC Global categories
Notification of conditional acceptance for Technical Papers

**JULY 18, 2003**
Submission deadline for High-Performance Bandwidth Challenge statements of intent

**JULY 31, 2003**
Final version of Technical Papers due to confirm acceptance
Submission deadline for Birds-of-a-Feather (BOFs) sessions
NOTE: BOFs that wish to include participation from remote Access Grid sites must submit by the SC Global deadline of April 25, 2003
Submission deadline for Exhibitor Forum
About Phoenix

Phoenix is the sixth-largest city in the United States and has a population of 1.3 million. The Greater Phoenix Convention and Visitors Bureau provides local information on the Web at: http://www.phoenixcvb.com.

Weather in Phoenix

The average high temperature for Phoenix in November is 74 degrees, while the average low is 47 degrees. Current conditions can be found on the Web at: http://www.phoenixcvb.com/visitor/index.cfm?action=weather&subSection=1.

High-Tech Finds a Home in Phoenix

Major High Tech employers in Greater Phoenix include Fortune 500 companies such as Intel, Motorola, Medtronic, and Sanmina-SCI. The region is also home to other high tech companies such as ON Semiconductor, Encompass Electrical Technologies, Suntron Corp., ST Microelectronics, AG Communication Systems, and Varian Electronics Manufacturing.

The Greater Phoenix High Tech cluster includes the computer hardware, electronic equipment, semiconductor, telecommunications and related industries. These industries develop, manufacture and distribute products such as office equipment, measuring and controlling devices, circuit boards and associated items to the market.

Greater Phoenix Advantages

**Critical Mass:**
- Greater Phoenix has a well-established base of firms in the high tech industry, including Intel, Motorola, Microchip Technology, and ON Semiconductor. The industry is now positioned to increase its effectiveness in higher-value business services.

**Talent:**
- Employers in the area have access to a large pool of talented administrative, executive, and professional workforce, including those trained in business, professional and technical services.

**Education:**
- Greater Phoenix has a number of colleges and universities that offer programs of study in many aspects related to High Tech.

**Land:**
- Large amounts of land are available to High Tech companies for industrial development.

Recent Market Developments

- Many High Tech companies, such as Isola and Nikon SITECH, have recently located to Greater Phoenix.
- Employment in semiconductor manufacturing, which comprises one-third of Arizona's High Tech manufacturing employment, is expected to grow 6.5% by 2008.
- Many companies, such as Intel and ON Semiconductor are expanding operations due to increased demand.
Welcome to the SC2003 Interactive Calendar. This page provides the latest, most comprehensive guide to the conference Technical Program and other activities.

The page will be updated and expanded regularly before and during SC2003. As an experiment for this year, this calendar will replace much of the information usually contained in the 200-page Final Program handed out at past conferences. The Interactive Calendar’s Web format will provide the latest most accurate information to conference attendees.

### Saturday, November 15

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<tr>
<td>Tutorial</td>
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<td>Remy Evard (Argonne National Laboratory)</td>
<td>S01: Production Linux Clusters 2003 - Architecture and System Software for Serious Computing</td>
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<td>Robert L. Grossman (University of Illinois at Chicago)</td>
<td>S02: A Tutorial Introduction to High Performance Data Transport</td>
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<td>S03: A practical approach to performance analysis and modeling of large-scale systems</td>
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<td>S04: Real World Techniques for Scientific Applications of Scale</td>
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<td>Blaise M. Barney (Lawrence Livermore)</td>
<td>S05: An Introduction to the TotalView</td>
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