CONF-961104--Abstr.

SUPERCOMPUTING '96 INFORMATION

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FTP: ftp.supercomp.org (cd /pub/sc96)
EMAIL: questions96@mail.supercomp.org
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GENERAL ADDRESS

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Pittsburgh, Pennsylvania 15213

EXHIBITOR INFORMATION

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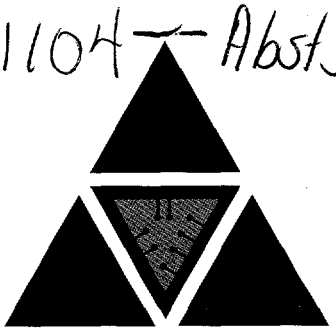
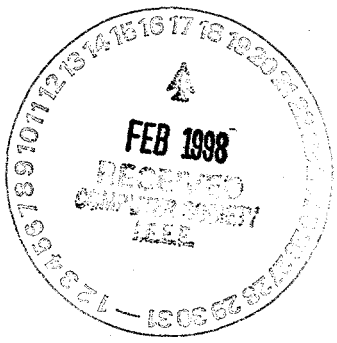


SUPERCOMPUTING '96
NOVEMBER 17-22 • PITTSBURGH

February 13, 1998



Mr. L. Mark Wice
Acquisition & Assistance Group
Contracting Officer
Department of Energy
Chicago Operations Office
9800 South Cass Avenue
Argonne, Illinois 60439

Dear Mr. Wice:

On behalf of the SC'96 Conference and the IEEE Computer Society it is my pleasure to provide you with this report on the use of U.S. Department of Energy's $12,000 grant to the SC'96 Education Program.

The SC'96 Education Program provided a three-day professional development experience for middle and high school science, mathematics, and computer technology teachers. The program theme was *Computers at Work in the Classroom*, and a majority of the sessions were presented by classroom teachers who have had several years experience in using these technologies with their students. The teachers who attended the program were introduced to classroom applications of computing and networking technologies and were provided to the greatest extent possible with lesson plans, sample problems, and other resources that could immediately be used in their own classrooms. The attached *"At a Glance" Schedule and Session Abstracts* describes in detail the three-day SC'96 Education Program.

The SC'96 Education Program placed a major emphasis on using the World Wide Web (the web) to publish the conference session materials. The purpose for using the web in this way was to enable conference attendees to access the classroom materials (lesson plans, sample problems, free software, etc.) that were presented in the education program sessions from their home schools after the conference concluded. The attending teachers expressed real excitement at being able to go back to the web site after the conference for these materials and to interact with session presenters via electronic mail. The SC'96 Education Program URL is http://www.supercomp.org/sc96/education/.

It was a little disappointing that the web-based special interest groups (SIGs) did not attract more participation from the teachers. It was our hope that the teachers who connected in person at the conference would take the opportunity to join these same people in an on-line discussion group organized around a topic of special interest. We did have some teachers sign-up for each of the three SIGs, as follows: SIG on Mentors - 10 participants; SIG on Projects -13 participants; and SIG on Networking - 12 participants.

The most important new step that the SC'96 Education Program took was to encourage teachers to become presenters. K-12 teachers seldom consider themselves as "experts" with

DISCLAIMER

anything special to impart to their colleagues. The K-12 community usually looks to external expertise for new and innovative uses of technology. It was very gratifying that many teachers accepted the challenge to be session presenters; in fact, nearly 75% of the program sessions were presented by K-12 teachers.

The attached *SC'96 Education Program Evaluation Report* summarizes demographic information about the teachers who participated in the SC'96 Education Program as well as the information we collected from our web-based evaluation survey.

Also attached is the *SC'96 Education Program Financial Report.* It details the amount of funds expended for specific purposes. The $12,000 DOE grant was used as follows.

Travel support for teachers to attend SC'96	$ 7,124.62
Education reception	1,126.66
Education coffee breaks	547.04
Education luncheon	644.00
Conference reception - Monday (teachers' attendance)	552.00
Conference reception - Thursday (teachers' attendance)	46.00
Rental of audio/visual equipment	1,959.68
	$12,000.00

Thank you for your support of the SC'96 Education Program. If you have questions about this report or need further information, please call me at the phone number shown below.

Sincerely,

Margo J. Berg
SC'96 Education Program Chair
Phone: 612-724-2705

Cc: Anne Marie Kelly
IEEE Computer Society
1730 Massachusetts Avenue, NW
Washington, DC 20036-1992

Teacher Participation – from SC'96 Conference records

Total number of teachers attending	141
Number of teachers who presented workshops/papers/panels	24
Number of teachers who served on the Education Committee	6
Number of teachers who received travel support	64
Number of teachers from the Pittsburgh area supported with funds from Pittsburgh foundations	47

All following data is from the SC'96 Education Program Web-based Evaluation

Demographic Information

Attended SC Before	Responses	Percentage
Yes	27	67.5
No	13	32.5
Total	40	

Subjects Taught	Responses	Percentage
Mathematics	10	15.15
Computer Science	13	19.70
Computer Applications	13	19.70
Science	23	34.85
Other	7	10.60
Total	66	

Grades Taught	Responses	Percentage
Elementary (K-5)	0	0
Middle (6-8)	9	20.93
Upper (9-12)	34	79.07
Total	43	

Computer Experience	Responses	Percentage
None	1	2.5
Novice (Beginning experience)	2	5.0
Intermediate (Comfortable as a computer user)	15	37.5
Advanced (Comfortable as computer teacher)	22	55.0
Total	40	

Internet Experience	Responses	Percentage
None	0	0
Novice (Beginning experience)	3	7.5
Intermediate (Comfortable as an Internet user)	11	27.5
Advanced (Comfortable as an Internet teacher)	26	65.0
Total	40	

Evaluation of the Overall Quality of the Education Program

	Responses	Percentage
Not Applicable	2	5.72
Very Dissatisfied	0	0
Dissatisfied	1	2.86
Neutral	0	0
Satisfied	9	25.71
Very Satisfied	23	65.71
Total	35	

Comments:

I feel that I have received more this year to share with fellow teachers than I have last year. The format of the lab and lectures were more accommodating. The group was smaller this year than previous years and this may be the factor behind the information accumulation that I have acquired.

Good to see others using STELLA in a very similar manner to what we are doing.

This is a very valuable connection for teachers who have similar "leanings" if not specifically similar focus. Thus the sharing of innovative techniques, plus hardware and software specifics is very valuable. The field is still new for many of us, and changing constantly, so this kind of national confab is really great.

Well Done- A lot of people did a lot of work to make this a fine program for teachers

I find that there are only so many sessions a person can get to. All of these were noteworthy topics. I only hope that the number of offerings will grow and continue to be relevant to the needs of our different groups of students.

I thought that there was much to take back to our schools. Almost everything had a potential from a discussion level to actual hands on.

Wonderful to have computers available without overcrowding like last year. Good presentations with lots more meat that is applicable to me.

Wonderful Conference!! Thrilled to be here again. I am amazed at the advances from last year. Of course my advances from last year are even MORE. This conference really got me moving and I could have never dreamed of the opportunities and information afforded me.

Informative and useful.

There wasn't enough diversity in the sessions.

Since SGI was so involved with the program, I would have liked to see some workshops on computers in art.

I felt it was too limited. I preferred the format of the past where there were more concurrent sessions and they were not repeated so often. If you ended up in a session that wasn't very appropriate then it seemed like a lot of wasted time. I love

the on-line info of all the presentations and all the links to the wonderful information. Great idea!

Needed a bit more variety. I teach computers and not science or math.

So far the flexibility that has been offered this year has been a benefit.

This undertaking is difficult, because you are dealing with people who bring in such a variety of experience levels. You did well to offer something for everyone. The chance to immediately follow up a session with a hands-on workshop was excellent design on your part. The length of the sessions at 90 minutes was appropriate. Only a few presenter groups rushed or underplanned.

Evaluation of the Hands-on Computer Facilities

	Responses	Percentage
Not Applicable	2	5.71
Very Dissatisfied	0	0
Dissatisfied	0	0
Neutral	0	0
Satisfied	11	31.43
Very Satisfied	22	62.86
Total	35	

Comments:

I like having both the Macs and the PC's. I also felt that the access has been fine.

Adequate lab facilities.

We needed to have more computers. I felt like I had less hands-on time than in the past.

This was a tremendous reinforcement. I really enjoyed this part. The tutorials were documents that were well done.

I was able to do anything that I chose to do with the materials at hand. Good access and facilities.

I could always get to the computers when needed.

The set up you had last year, worked much better. you had better access to the presenters. With two groups trying to work together it seemed confusing.

The idea of a separate lab seemed successful.

An outstanding conference! Thanks for the tremendous job you all did in planning and carrying out those plans.

Adequate help was available for L2 and L4

Wish lab were available more often!

Keep the computer lab open as much as possible.

Q: How are you planning to share the information you gained at SC'96 with your students and colleagues?

I intend to introduce computer modeling to my students. My team of teachers will benefit by the excitement that I will return with.

I will use the WWW stuff to teach some of my upcoming units. I am part of an interdisciplinary team of teachers and I will share the links and the home page connection with them.

This year above last year, I spend available time out on the display floor gathering mentors and sources of science sites on the web

I am now able to teach

I plan on using some of the presented models in my classes as examples or as problems for them to solve

Place more emphasis on mathematical relationships in science.

Through new connections with teachers across the net. A couple of specific lab ideas (and collaborative projects) will also be implemented -- especially the Eratosthenes project, and tracking changes in the Sun's altitude.

Conducting inservice on Internet use for teachers and students will be using more modeling in classes aiming toward starting a computational science class

Inservice

I will continue to present at our local school symposium and through area education agency activities. I am also going to take information to fellow AiS teachers. In addition, we have had teachers voluntarily meeting after school on Thursdays to learn more about the Internet and I can share some information there. I also will continue to do local inservices. Recently, our faculty has been thinking about starting sessions for the community to learn about Internet. It is possible that I could also show some of the visualization tools for the parents to understand what the kids are doing. This would be a new way of sharing for me.

I hope to meet with department chairs to ask how they would like materials shared. Additionally, I'd like to post information in a public e-mail file for teachers in my district to reference.

We will have a series of inservices to introduce our faculty to some of the various programs. We are intending to introduce Stella and Matlab as modeling tools in some of our classes. We have also discussed offering a class in Matlab, Stella, Hyperstudio, Excel, NIH Image and other types of modeling software.

Yes, I will show them how to use ALICE and Madonna and I will do my computational programming work with a more mathematical structured approach.

I will make my supervisors aware of what computational science means and how it fits with our state's core learning goals. Then I would like to design a collaborative project using computational science and mathematical modeling.

I will incorporate STELLA models in lessons. I currently use the models are a review technique. I feel more confident in constructing running models of STELLA and in the assessment of such projects, that I will encourage my students to construct and utilize models in their discovery of their problem. I would enjoy incorporating the net -based curriculum in with mine. It is so well designed to the bench-marks and MD core learning Goals.

We are installing equipment that will allow me to share what I have learned here. We are getting a direct connection to the Internet so that we can train large groups on how to integrate the web into instruction. This is the first time I will be able to share on a large scale.

I video taped many of the exhibits. Can't wait to show my kids the visualizations. I have great new web sites to share with my peers. The web pages to use at home will be a GREAT help. When we return and just can't remember exactly what we did--there it is!!

I will try to incorporate many of these things into my classes. Pass materials on to others in my dept.

I will be meeting with the high school teachers and using this website to show the teachers the different opportunities out there. The on-line site is a wonderful idea.

I will be sharing the information on Alice and also the telementoring program for female students with other schools outside our school system.

I plan on using the Stella programs with my 6th grade students. I also plan on using the Montana project with them and sharing this with my teaching partner so that we can have some interaction with others using these projects.

I will conduct workshops and do staff inservices.

I am glad to know that this software is available from the net free of charge. As soon as the line for the network is reconnected, I plan on retrieving a copy and working with it. The modeling programs and what teachers are doing in the regular classroom is astounding.

I want to write a staff development grant to utilize what I have learned and teach other teachers in my state. Already I have a group of teachers that will be meeting the Wednesday after Thanksgiving to hear what I learned. I have some specific applications that fit better into their classes than my classroom content area.

I'll bring Alice to our science teachers, and demo Stella for them again.

As my course continues to evolve, I plan to individualize the instruction more. This year I found several on-line sources that will aid in this plan.

I will be doing small inservice classes, implementing ideas myself, beginning a big new project, and trying to write a grant.

Definitely plan to share what I've learned. Not sure yet what and how because I need to get with our math and science teachers to share what I've learned.

Our school district hosts a computer symposium in February 1997 and I work as a presenter and on various committees in setting the program for the symposium. We are currently upgrading the network in the school so that we will have Internet connections in each classroom. We will be training the staff members in the use of e-mail and some basic Internet usage. The difference between this conference will be focusing on the integration of Supercomputing into the curriculum. For example, the session on the stream model mentioned that this was being done in AP Biology classes.

I will be likely to order some of the software that I used for the first time here.

Q: Please give details on any area which needs improvement.

More variety in the sessions. I wish there had been something on grant writing and funding opportunities. We teachers need help in funding this wonderful stuff.

I notice this year the only time that I had to get to the displays was during lunch.

There needs to be a wider variety of options for the presentations.

Everything was pretty OK

Mail the tickets earlier.

I found most sessions very helpful. Some were more clearly defined but each had merit in a positive educational and computational way. You have to start with a first step.

Good hands on activities could be brought to the convention by the teacher participants and shared with each other.

Just need a bit more enthusiasm.

The separation of the labs from the session was not as satisfactory as it was in the past.

Sometimes I felt that I was locked into sessions with labs immediately following and this kept me from going to other sessions which were not repeated. I don't know how to remedy this. On the other hand it helped to have the chance to practice with the software immediately and on site.

Completely satisfied.

More sessions Computers in the classroom

Teachers need more time at the research exhibits to talk with these people and see what is happening in their world so that we can bring this experience back to our students

and make contacts for mentors for our computational science and technology classes.

More diversity in sessions.

Nothing that I can think of at this time. This conference was wonderful!

I preferred the format in which the hands-on activities occur along with the talk.

I hope word can get out to more teachers so that they can have the same wonderful experience. I will do my part and bring some with me next year.

Variety

I expected a master list of the institutions or grant sites that would be doing computational science training for teachers next summer. Can you include such a listing on your WEB page from this conference?

Q: What was the best part of the SC'96 Education Program?

The opportunity to experiment with new ideas.

Hands on sessions and access to the computers to practice the different programs we have learned about. I appreciate the way it begins on Sunday to keep me in my classroom as much as possible.

The lab/lecture format.

Seeing more of what we are doing.

The connections that are established with other teachers

Interaction with teachers who have the same goals, interests, and challenges as I do.

Just the combination of sharing with innovative teachers after the presentations

Opportunity to talk to other teachers

MVHS [Maryland Virtual High School]

Having classroom examples shown in the sessions that could be used when we returned home. As always, it is great to see other teachers from around the country and share with them how things are done in various school districts. As someone from a rural school and the only computer teacher, it is great to gain information from others.

I especially enjoyed the networking with other professionals (teachers, scientists etc.)

It was good to have some hands-on time to try some of the things learned. The exposure to others and their ideas is always helpful.

Workshops and Exhibits.

Meeting other people from across the country who are interested in what we are doing. The networking was definitely good this year.

The open lab sessions. The people !

Meeting other teachers who are interested in the same ideas and hearing about what other schools are doing.

Networking and sharing always the best. I came with many questions....and got most of them answered. The tour through the exhibits was a super idea. This will give our students a view of computational science in a university setting.

The on-line site and the connection with the main floor with the educational session.

The workshops and panels and hands on lab.

I found them all interesting and helpful. Because of teaching 6th grade some where a little out of the reach of 6th grade students. But I did see a great value and way to adapt these programs to my student level.

The networking with other participants. I liked the hands-on lab.

This is my first SC convention. I especially like the inactive part with the software tools and the tutoring of the presenter.

A number of activities---networking with other teachers, the workshops on applications as they were used by others in their own content classrooms, and teacher professional development

Exploring new software, seeing the Computational Science programs in high schools, the research exhibits...

The practical aspect of how to make the computers really work for us and be relevant to the curriculum and students' learning (not to mention personal networking).

Facilities Variety of people to talk to and network with

I learned that many people from different educational settings and with various resources are making computational science happen for the students.

Q: What recommendations do you have for future Supercomputing Conference education programs?

Include more panels about what is happening in schools around the country. Include Virtual Reality applications in education. Have scientists that have been working with kids or teachers share their information. Give us a list of all the educators attending with their e-mails. Go back to the Educators Poster Session. I miss it. I gained a lot from the time and sharing of projects from other schools.

Basic workshops also need to be offered, some people may attend to learn basic networking concepts and even to construct cable (for instance).

I like this format

Find some way to advertise and encourage more teachers to attend

I liked not having to bring the poster for a poster session, but I miss not getting the information that I gained from seeing other poster presentations. Perhaps, we could bring information "pamphlets" that could be placed at the education booth on the display floor. This would add to that booth, plus let us get info. from other schools.

Have the lab open a little longer in the afternoon and evening.

Was very good the way it was set up.

In San Jose ... set up some tours of the silicon areas where chips are made or to Xerox Park, etc.

Information on how to gain the support of the local school board for these new ideas

Start earlier in the day (8:00) with the labs so we could get to more sessions.

Maybe have a session where teachers of like disciplines get together--science, math, computer, and other.

The provided snacks are good because we are in an area where there aren't any to get and it is a long day.

Additional time for teachers at the research exhibits.

More diverse sessions.

I like this format of presentations and follow-up with lab time.

If you want to have computational science in the science classrooms, funding science teachers is important. Telling them how the applications fit with their present curriculum and standards specifically would allow quick use of the materials when they return to the classroom. Technology is one of the required elements for all school districts to integrate in their programs.

I missed the NERSC programs. They are great applications for 6-12 students.

This is always tough. It was great; I wish some really good programs were not at the same time...but that is a given with as many needs as there are people; maybe even more repeats of hot new stuff!

Some of your presenters were not as polished as I would expect at a national conference.

Q: Please use the space below for additional comments or suggestions:

Continue to support this program!!! This part of the SC conferences has made a difference in schools all over the country. Thank you for the opportunity to take part in it.

Very well put together program.

We need to bottle the energy of the presenter from the Maryland Virtual High School project who did the stuff on the Sun (Eratosthenes) projects - FUN!

Please continue to have a mixture of "new and old" attendees at the conference. The feeling of a "reunion" is great, plus adding new faces and let others experience it is also excellent. Keep up the good work. The food was some of the best I have had at the conferences. Maybe that is because I am from middle America and the cuisine seemed more mainstream than "gourmet". Some fresh fruit would have been nice if it was not too expensive to get. THANK YOU TO ALL THE GROUPS THAT HELPED FUND THE CONFERENCE AND MAY THEY PLEASE CONTINUE TO DO SO. If they do not, it would be impossible for teachers from small rural schools to attend.

Thank you for a very enjoyable conference.

Haven't see it all yet.

The mathematical and computational level this year was just what I needed to help me in my class.

Arrange maybe one tour to a local educational site like a museum at the expense of the teacher...teachers don't get the opportunity to travel a lot and would enjoy this extra education experience...it could be the first day, like Saturday afternoon.

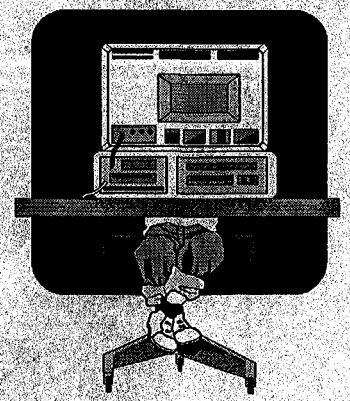
SC'96 Education Program Financial Report	Actual ----------			Rev. 2/20/97
Item	**No.**	**Amount**		**Comments**
Travel to SC'96				
Teachers (Attendees, Presenters, & Ed. Cmte)	83	$30,976.59	*	Grant funds from NSF ($23,851.97) and DOE ($7,124.62)
				used for travel support for 64 attendees, 17 education
				program presenters, and 2 education committee members
Education Committee chair		$10,161.56		
Subtotal		**$41,138.15**		
Registration				
Teachers (Presenters & Ed. Cmte members)	20	$4,000.00	*	Grant funds from the Westinghouse Foundation ($4,000)
				were used to pay registration fees for 17 teacher
				presenters and 3 education committee members
Teachers from Pittsburgh & Western PA schools	47	$9,400.00	*	Grant funds from The Buhl Foundation ($5,000); The Grable
				Foundation ($3,000); and the Heinz Endowments ($1,400)
				were used to pay registration fees for 47 area teachers
Subtotal		**$13,400.00**		
Meals, Breaks, & Special Events				
Education reception - Saturday		$4,898.54	*	Grant funds from NSF ($3,771.88) and DOE ($1,126.66)
Education coffee breaks		$2,378.44	*	Grant funds from NSF ($1,831.40) and DOE ($547.04)
Education luncheon - Sunday		$2,800.00	*	Grant funds from NSF ($2,156) and DOE ($644)
Conference Reception (Monday) Education		$2,400.00	*	Grant funds from NSF ($1,848) and DOE ($552)
Conference Reception (Thursday) Education		$200.00	*	Grant funds from NSF ($154) and DOE ($46)
Education Cmte meals & refreshments		$522.88		
Subtotal		**$13,199.86**		
Facilities & Equipment				
Macs, PCs, printers -- rental		$15,416.51	*	Grant funds from Shodor Education Foundation ($1,000);
				Westinghouse Foundation ($6,000); and Heinz Endowments
				($8,416.51) were used for rental of computer equipment
Audio/Visual		$10,728.93	*	Grant funds from the Heinz Endowments ($183.49);
				IBM ($2,000); Cray Research/SGI ($2,000);
				NSF ($4,386.75); and DOE ($1,959.68) were used
				to pay for the rental of audio/visual equipment
Display Banner for Ed booth		$106.45		
Subtotal		**$26,251.89**		
Committee Support		**$31,186.59**		
ACM/IEEE Overhead		**$3,849.93**		
Total Expenses		**$129,026.42**		
Grants		**($83,000.00)**		Total DOE Funds used: $12,000.00
				Total NSF Funds used: $38,000.00
Total SC'96 Conference Budget Expenditure		**$46,026.42**		

SUPERCOMPUTING '96
NOVEMBER 17-22 • PITTSBURGH

SC'96 EDUCATION PROGRAM

COMPUTERS AT WORK IN THE CLASSOOM

"At a Glance" Schedule and Session Abstracts



SC'96 Education Program – At a Glance

	Workshop Sessions Doubletree Hotel Cambria Room	Workshop Sessions Doubletree Hotel Somerset Room	Computer Lab Doubletree Hotel Westmoreland Room	Paper/Panel Sessions Doubletree Hotel Fayette Room
Saturday Nov. 16				
1:00 pm - 6:00 pm	**Registration Desk and Conference Store Open in Convention Center**			
6:00 pm - 8:00 pm	**Education Reception for Teachers, Presenters, Education Committee, and VIP Guests** **Allegheny Ballroom – 3rd Floor – Doubletree Hotel**			

SC'96 Education Program – At a Glance

	Workshop Sessions Doubletree Hotel Cambria Room	Workshop Sessions Doubletree Hotel Somerset Room	Computer Lab Doubletree Hotel Westmoreland Room	Paper/Panel Sessions Doubletree Hotel Fayette Room
Sunday Nov. 17				
7:30 am - 6:00 pm	**Registration Desk and Conference Store Open in Convention Center**			
9:00 am - 10:00 am	**Education Program Opening Session in Allegheny Ballroom - 3rd Floor – Doubletree Hotel**			
10:00 am - 10:30 am	**Break**			
10:30 am - 12:00 pm	**[W1]** A Walk thru a Computational Science Project (Snyder/Avery)	**[W2]** Alice / Matlab in Physics & Earth Science (Higdon/Shaffer/Trout)	**[L1]** Network-Based Science Activities (Thomas/Stevenson)	
12:00 pm - 1:30 pm	**Education Luncheon in Allegheny Ballroom - 3rd Floor – Doubletree Hotel** *(jointly with the Tutorials Luncheon)*			
1:30 pm - 3:00 pm	**[W3]** Computational Modeling ... Lee's Summit (Biggerstaff/Snow/) Nazworthy)	**[W4]** Use of Image Analysis ... Snail Shell (Lilly/Fink)	**[L2]** Hands-on Lab Session for **W1 & W2**	
3:00 pm - 3:30 pm	**Break – Refreshsments Provided – 2nd Floor Foyer – Doubletree Hotel**			
3:30 pm - 5:00 pm	**[W5]** Air & Water Quality Projects (Peterman/Hisim/ Hammond/Shaffer)	**[W6]** Publish & Use Curricular Materials on the Web (Boone/Lanius)	**[L3]** Hands-on Lab Session for **W3 & W4**	
5:00 pm - 7:00 pm	**Dinner Break**			
7:00 pm - 9:00 pm			Open Computer Lab	

SC'96 Education Program – At a Glance

Monday Nov. 18

	Workshop Sessions Doubletree Hotel Cambria Room	Workshop Sessions Doubletree Hotel Somerset Room	Computer Lab Doubletree Hotel Westmoreland Room	Paper/Panel Sessions Doubletree Hotel Fayette Room
7:30 am - 9:00 pm	**Registration Desk and Conference Store Open in Convention Center**			
8:30 am - 10:00 am	**[W7]** Repeat **W1** Computational Science Project (Snyder/Avery)	**[W8]** The WAVE Project: Web Access Virtual Ed. (Castellon/Woods)	**[L4]** Hands-on Lab Session for **W5 & W6**	
10:00 am - 10:30 am	**Break**			
10:30 am - 12:00 pm	**[W9]** Repeat **W3** Modeling ... Lee's Summit (Biggerstaff/Snow/) Nazworthy)	**[W10]** Population Models STELLA II & Madonna (Bulka/Ragan)	**[L5]** Hands-on Lab Session for **W7 & W8**	
12:00 pm - 1:30 pm	**Lunch Break**			
1:30 pm - 3:00 pm	**[W11]** Repeat **W2** Alice / Matlab (Higdon/Shaffer/Trout)	**[W12]** Repeat **W4** Analysis ... Snail Shell (Lilly/Fink)	**[L6]** Hands-on Lab Session for **W9 & W10**	Papers: 1) Girls & Computational Science; 2) Telementoring & Girls
3:00 pm - 3:30 pm	**Break – Refreshsments Provided – 2nd Floor Foyer – Doubletree Hotel**			
3:30 pm - 5:00 pm	TBA	Hawaii Virtual Academy (Kajioka/Mooradian)	**[L7]** Hands-on Lab Session for **W11 & W12**	Panel: Computing & Communications in Teacher Preparation & Prof. Development (Thomas)
5:00 pm - 7:00 pm	**Dinner Break**			
7:00 pm - 9:00 pm	**SC'96 Conference Opening Reception in Convention Center Exhibit Hall**			

SC'96 Education Program – At a Glance

	Workshop Sessions Doubletree Hotel Cambria Room	Workshop Sessions Doubletree Hotel Somerset Room	Computer Lab Doubletree Hotel Westmoreland Room	Paper/Panel Sessions Doubletree Hotel Fayette Room
Tuesday Nov. 19				
7:30 am - 9:00 pm	**Registration Desk and Conference Store Open in Convention Center**			
8:30 am - 10:00 am	**Conference Keynote Address in Doubletree Alegheny Ballroom**			
10:00 am - 10:30 am	**Break**			
10:30 am - 12:00 pm	Real World Networking in Schools – Common Knowledge: Pittsburgh (Check/Franklin/Kern)	Papers: 1) ASPIRE Program; 2) NM HS Challenge; 3) SuperQuest	[L8] Tools for Assessing Learning (Tsikalas/Honey)	Introduction to Self-Guided Tour of Research Exhibits (Avery/Swanson)
12:00 pm - 1:30 pm	**Lunch Break**			
1:30 pm - 3:00 pm	Introduction to Self-Guided Tour of Research Exhibits (Avery/Swanson)	HPCC and the National Mathematics & Science Education Standards (Berg/Panoff)	[L9] Resources for Computational Science: Workstations & the Web (Whitlock/Swanson)	Panel: Critical Issues in Educational Mentoring & Telementoring (Tsikalas)
	Also: SC'96 Technical Program Session 2A – Visualization and Education in the Convention Center (check SC'96 final program for room location)			
3:00 pm - 3:30 pm	**Break**			
3:30 pm - 5:00 pm	**Education Roundtable in the Convention Center** *Ten Years of K-12 High Performance Computing and Communications: What Have We Learned? What Are We Building for the Future?* (Ziebarth)			
5:00 pm - 7:00 pm	**Dinner Break**			
7:00 pm - 9:00 pm			Open Computer Lab	
9:00 pm	**Education Program Ends • Thank You for Attending**			

Education Program – Session Abstracts

Please refer to the "At a Glance" schedule for room assignments.

Sunday, November 17, 10:30 - 12:00

A Walk Through a High School Computational Science Project
Jill Snyder, Albuquerque High School
Paula Avery, Moriarty High School
New Mexico Adventures in Supercomputing

This session will explore the development of a high school computational science project by discussing topic selection, research, mathematical and computational modeling, visualization, and interpretation of results. An on-line high school computational science textbook will be used as a resource for this activity. An example project based on population growth models will be used to demonstrate the elements of a computational science project. After determining the mathematical models, workshop participants will manipulate the input of the computational models, visualize the output data, and analyze the results.

Integrating Computational Collaborative Projects into the Science Classroom — Using Alice Data Tools and Matlab in Physics and Earth Science
Maryland Virtual High School teachers:
Don Higdon, Arundel High School
Don Shaffer, North East High School
Charlotte Trout, Williamsport High School

This workshop will include activities involving shadow measurement, determination of the epicenter of an earthquake, and sound wave analysis. The Noon Measurement Project involved the measuring of a gnomon's shadow on the spring equinox, summer solstice and fall equinox. These simple shadow measurements may used to determine the Earth's circumference, the Earth's rotation velocity, magnetic variations and the distance to the moon. The Earthquake Project, executed in May 1996, was designed so that students would have to share data in order to determine the epicenter of a hypothetical Maryland quake. Although the earthquake did not actually occur, there was a great deal of excitement generated as the students learned about s and p waves and plotted their circles to find the point of origin. The Sound Wave Project will engage those students who are musically inclined. Sound files, collected with a CBL and TI-82 graphing calculator, will be analyzed with MATLAB for fundamental frequencies and overtones. The students will learn the answer to the question: "How do we know what instrument is playing?"

Network-Based K-12 Science Activities Integrating Mathematics, Science, and Technology
Dave Thomas, Montana State University, and Stephanie Stevenson, Holley-Navarre (Florida) Intermediate School; Network Montana Project

The Network Montana Project is developing Internet-based K-12 curricular and teacher training materials that integrate mathematics, science, and technology instruction. This workshop will introduce K-12 educators to these materials and a graduate level distance learning course that provides a systematic orientation to these materials.

Notes

Sunday, November 17, 1:30 - 3:00

Computational Modeling at Lee's Summit High School
John Biggerstaff, Jackie Snow, and Jim Nazworthy, Lee's Summit (Missouri) High School and Project MOST

This workshop will concentrate on using modeling software such as STELLA II, from High Performance Systems, to create models of real world dynamic systems. This type of modeling allows for an active learning environment with student or teacher directed investigation. Powerful analysis tools allow students to build understanding and multimedia capabilities allow for different learner styles. Sample models created by students and teachers involved with Project MOST, an NSF supported project, will be presented. Participants will help in the development of a dynamic population model during the workshop and will be provided the opportunity to create their own models with the software or to explore further the sample models presented.

The Use of Image Analysis to Quantify Damage to a Snail Shell
Albert Lilly and Thomas Fink, Alabama School of Mathematics & Science

With the proliferation of WWW sites, computational scientists have the opportunity to download images and analyze them. For example, it is possible to acquire the image of a snail (Neritina usnea) whose shell has been damaged by barnacles. Certain techniques are used to compute the percent of damage. These same techniques are also necessary for more complex projects such as the analysis of stellar images.

Sunday, November 17, 3:30 - 5:00

Training Teachers to Publish and Use Curricular Materials On the WEB
Susan Boone, Saint Agnes Academy
Cynthia Lanius, Milby High School
GirlTECH Program

This presentation will describe a program that incorporates the Internet as a teaching and learning tool. During the first session, the outline of GirlTECH '96, a program that the Center for Research on Parallel Computation (CRPC) implemented in the Houston area, will be presented. The basics of the Internet as well as the process of using the Internet as a collaborative instructional tool in mathematics and science classes will be the focus. Lessons developed during GirlTECH will be reviewed. In the hands-on session teachers will explore the various curricular materials that were a product of GirlTECH, critique them, and actually work through the problems. They will be given the opportunity to develop their own ideas and encouraged to post the type of lesson that incorporates the use of the Internet as an integral application or research tool.

Integrating Computational Collaborative Projects into the Science Classroom — Air and Water Quality Projects in Chemistry and Environmental Science
Maryland Virtual High School teachers:
Phil Hammond, Smithsburg High School
Nusret Hisim, Walkersville High School
Ron Peterman, James Bennett High School
Don Shaffer, North East High School

This workshop will include demonstrations of computational activities involving air and water quality and change of state. The Boiling Point Project, executed in November 1995, was the first collaborative project for MVHS. By compiling data regarding altitude, pressure, water boiling point and naphthalene boiling point, it was hypothesized that a relationship between altitude and boiling point would be determined. The CO2 and Stream Studies Projects are to be executed during the 1996-97 school year. By measuring the level of carbon dioxide in the air in monthly intervals, sharing results with schools in other communities, and plotting the results with Alice software, students will investigate whether CO2 varies with season, location, temperature, or elevation. Using this data, a STELLA model of CO2 production may be developed. The water quality of a stream is measured by its species diversity, but the stream is affected by the land use around it. NIH Image software can be used to analyze remote sensing images of the land. The students in the MVHS schools will collect a variety of data regarding their local stream and will use that data to predict the health of the stream. Results will be shared, plotted and used to create a STELLA model of the factors affecting the health of a stream.

Monday, November 18, 8:30 - 10:00

A Walk Through a High School Computational Science Project
Jill Snyder, Albuquerque High School
Paula Avery, Moriarty High School
New Mexico Adventures in Supercomputing

Repeat. See abstract on Sunday, November 17, 10:30 - 12:00.

The WAVE Project: Web Access Virtual Education
Carol Castellon and Debra Woods, University of Illinois Laboratory High School; Robert Dickau, Wolfram Research

Mathematica is commercial software distributed by Wolfram Research, Inc., which has numeric, symbolic and graphical capabilities combined with a work-processor. Although Mathematica was developed for high-end users, the WAVE Project takes advantage of its graphical capabilities to provide computer demos for the high school math classroom to assist instruction to a level which cannot be achieved with hand-held graphing calculators alone. About sixty WAVE notebooks are available for downloading to any teaching with the Mathematica software and access to the Internet. This workshop will provide teachers with basic training in using Mathematica software, and in downloading and using the notebooks made available by the WAVE Project. The WAVE notebooks will run on either IBM or Mac platforms and are distributed free-of-charge.

Monday, November 18, 10:30 - 12:00

Computational Modeling at Lee's Summit High School
John Biggerstaff, Jackie Snow, and Jim Nazworthy, Lee's Summit (Missouri) High School and Project MOST

Repeat. See abstract on Sunday, November 17, 1:30 - 3:00.

Integrating Computational Collaborative Projects into the Science Classroom -- Population Models: Epidemics to Ecosystems (STELLA II and Madonna)
Maryland Virtual High School teachers:
Tom Bulka, Garrett Northern High School
Susan Ragan, Montgomery Blair High School

This workshop will concentrate on the use of STELLA to model populations, diseases, and biological systems. Wild animal population management is of great concern throughout the United States. What are the factors that contribute to a population change? How does one attempt to predict the future? What role does human intervention play? These questions are addressed in the Garrett County Bear Model. The spread of disease has always concerned mankind. The Ebola virus is frequently studied as a particularly lethal one. How can a computer model clarify some of the issues involved in the stages of a disease and its spread to others? Every science consists of systems that change over time. Some of these are difficult to study in the typical high school laboratory, and others involve concepts that are complex in nature. STELLA can be used to clarify the components of the system and thereby increase student comprehension. One example is Cellular Respiration.

Monday, November 18, 1:30 - 3:00

Integrating Computational Collaborative Projects into the Science Classroom — Using Alice Data Tools and Matlab in Physics and Earth Science
Maryland Virtual High School teachers:
Don Higdon, Arundel High School
Don Shaffer, North East High School
Charlotte Trout, Williamsport High School

Repeat. See abstract on Sunday, November 17, 10:30 - 12:00.

The Use of Image Analysis to Quantify Damage to a Snail Shell
Albert Lilly and Thomas Fink, Alabama School of Mathematics & Science

Repeat. See abstract on Sunday, November 17, 1:30 - 3:00.

Paper Session I

Girls and Computational Science
Gypsy Abbott, University of Alabama at Birmingham
John Ziebarth, National Center for Supercomputing Applications
Gina Sullivan, Bob Jones (Alabama) High School.

Telementoring as a Gateway for Girls into Science, Engineering and Computing
Dorothy Bennett, Center for Children & Technology
Don Thatcher, North High School, Des Moines, IA
Kallen Tsikalas, Center for Children & Technology
Jill Snyder, Albuquerque High School

Monday, November 18, 3:30 - 5:00

Hawaii Virtual Academy - The Electronic School of Hawaii
Vicki Kajioka, Hawaii State Department of Education
Marsha Mooradian, Maui High Performance Computing Center

The Electronic School is a new and dynamic initiative which provides educational offerings for all students utilizing the technological and telecommunication infrastructure currently in place in schools connected to the Internet. Delivering education via this Electronic School provides students with an avenue to be able to take additional courses to satisfy the new graduation requirements. Students will also be able to take courses which can accelerate their course of study, are not available at their present school site, or which can help them acquire workplace skills. The Electronic School is designed to provide an alternative delivery system for course instruction for secondary students. The curriculum extends beyond classrooms to a network of worldwide resources. It includes an on ramp to the Information Super Highway (Internet), instant access to worldwide information, and global communication services. Electronic School classrooms extend the traditional school day and expand awareness by including experiences from around the world.

Panel: Integration of Computing and Communications Technologies in Teacher Preparation and Professional Development
David Thomas, Montana State University, moderator

A panel comprising speakers from colleges of education; undergraduate departments in the sciences, mathematics, engineering, computer science, information sciences/technology; state departments of education; school district staff; and/or organizations that provide K-12 teacher professional development will discuss how and to what extent computing and communications technologies are being incorporated in pre-service teacher education and in-service teacher professional development.

Tuesday, November 19, 10:30 - 12:00

Strategies and Tools for Assessing Students' Learning in Project-Based, Computational Science Courses
Kallen Tsikalas, Center for Children & Technology

For the past three years, EDC's Center for Children & Technology has worked with the Department of Energy's Adventures in Supercomputing (AiS) program to evaluate how well students learn in project-based, computational science courses on the high school level. Students who participate in AiS spend several months developing and revising research questions, mathematical models, and computer programs. Based on this research, the Center has designed a suite of Web-enabled software tools/templates to help teachers support and assess their students' learning. These tools enable teachers to collect useful information about aspects of their students' work that are both most elusive but also necessary for a thorough evaluation of student learning. These tools externalize those processes of student reasoning that are normally implicit, thereby providing teachers and mentors with a window into student thinking and an opportunity to shape thinking processes. In this session, the tools will be further described and demonstrated.

Real World Networking in Schools – Common Knowledge: Pittsburgh
Barry Check, Priscilla Franklin, Joseph Kern

Abstract not available.

Introduction to Self-Guided Tour of Research Exhibits
Paula Avery and Chuck Swanson, coordinators

The SC'96 conference research exhibits provide a tremendous educational potential. This session will provide a brief introduction and overview of the exhibits following which participants will go to the exhibit hall to tour the research exhibits. The coordinators of the session have worked with the SC'96 research exhibitors to recruit specific booths where researchers have volunteered to provide talks and presentations of their work for teachers.

Paper Session II

Student Outcomes for the Alabama ASPIRE Program
Gypsy Abbott, University of Alabama at Birmingham
Carl Davis and Edna Gentry, University of Alabama at Huntsville

New Mexico High School Supercomputing Challenge, 1990-1995
David Kratzer, Los Alamos National Laboratory

Survey of Student Experience and Impact on Education and Career Choices in the SuperQuest Programs
Margo Berg, MJB Consulting Office

Notes

Tuesday, November 19, 1:30 - 3:00

Resources for Computational Science: Workstations and the Web
Jennifer Whitlock, Silicon Graphics, Inc.
Chuck Swanson, Cray Research

The presentation will feature a Silicon Graphics workstation used to demonstrate web-based resources for computational science education.

Panel: K-12 Computing and Communications and the National Mathematics and Science Education Standards
Margo Berg, MJB Consulting Office, moderator

The National Council of Teachers of Mathematics (NCTM) and the National Research Council (NRC) have respectively developed standards for mathematics and science education. These standards, along with many new state curriculum frameworks, require teachers to evaluate their classroom practices and in some cases re-think their approach to teaching. High performance computing and communications (HPCC) technologies – modeling, simulation, visualization, the Internet, and the World Wide Web – can facilitate the kind of teaching and learning called for in these standards.

A brief introduction and overview of the national math and science education standards, with a focus on the content and teaching standards, will be presented. A facilitated discussion among presenters and session attendees will include questions such as these: Which of the math/science content and teaching standards are best suited to HPCC technologies? What strategies can teachers use to inform their school administration and parents about the way that HPCC technologies support the standards?

Introduction to Self-Guided Tour of Research Exhibits
Paula Avery and Chuck Swanson, coordinators

Repeat. See abstract on Tuesday, November 17, 10:30 - 12:00.

Bringing the Outside In: Critical Issues in Designing Educational Mentoring & Telementoring
Kallen Tsikalas, Center for Children & Technology, moderator
Dorothy Bennett, Center for Children & Technology
Gary Johnson, TechCorps of America
Laura DeMarotta, Horace Maynard High School
Bruce Bennett, North Polk High School

Increasingly, educators are asked to juggle the complex agendas of educational reform: to create instruction that is student-centered, that engages young people on their own level about their own interests, while at the same time keeping pace with technology and adhering to assessment standards. In this ever-changing environment, teachers and educational reformers are looking outside the classroom for ideas and assistance. This panel session addresses the following questions related to bringing the outside in: What do we perceive as the role of outside mentor/experts in our classes? How are these roles different in on-line vs. in-person contexts? How do we best prepare students and mentor/experts for these experiences? How do we manage and assess such mentoring experiences? These issues are explored in the context of three educational initiatives with substantial mentoring components: Adventures in Supercomputing; Telementoring Young Women in Science, Mathematics & Computing; and Tech Corps.

Tuesday, November 19, 3:30 - 5:00

Education Roundtable
Ten Years of K-12 High Performance Computing and Communications: What have we learned? What are we building for the future?
John Ziebarth, NCSA, moderator

Programs such as Adventures in Supercomputing (AiS), the Alabama Supercomputing Program to Inspire computational Research in Education (ASPIRE), EarthVision, the National Education Supercomputer Program (NESP), the PSC High School Initiative, SuperQuest, and others have been offering in-depth training and experience with computational science tools and methods to teachers for a decade. This roundtable will offer a forum for those involved to discuss the successes and failures of these efforts and to communicate needs and goals for future efforts.