Girls Exploring Science, Engineering & Technology Event
February 23, 2004

hosted by
The Society of Women Engineers (SWE) Rocky Mountain Section
Lockheed Martin
Junior Achievement of Rocky Mountain, Inc.
and
The Women's Foundation of Colorado

Summary of Success
Final Report
June 14, 2004

FACT SHEET

WHAT:
The second annual *Girls Exploring Science, Engineering & Technology* event, designed to stimulate and encourage girls in grades 6 through 8 to pursue careers in science, engineering and technology, included motivational speakers, hands-on workshops, volunteer mentors and educational exhibits.

WHEN: Monday, February 23, 2004 from 9:00 a.m. to 1:00 p.m.

WHERE: The Adam's Mark Hotel in downtown Denver

WHY:
We want to encourage girls to pursue careers or interests in math, science, engineering, computers and technology because:

- Only 4% of Colorado girls specify engineering as a career interest on SAT tests
- A scant 1% of girls in Colorado indicate an interest in a computer science career
- Women make up 46% of the Colorado labor force but only 25% of technical fields
- Less than 10% of American engineers are women

WHO:

- 816 middle school girls (37% of the 2,200 registrations received)
- Over 85 adult chaperones (parents and teachers) and 150 volunteers attended
- 49 schools represented from 16 different school districts
- Denver Public Schools students made up 29% of total; Brighton Public Schools 10% and 13% from independent schools
- Over 46% minority participants
- Exhibit Booths showcased 17 exhibitors from higher education, community/professional organizations and governmental/educational entities

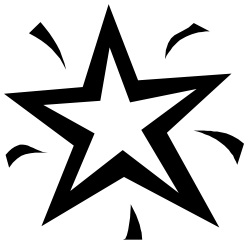
HOW:

- 14 organizations and individuals contributed $38,700 to cover direct expenses
- The Adam's Mark Hotel and other companies provided in-kind services valued at over $20,000
- Sponsors included:
  ♦ Lockheed Martin ♦ Agilent Technologies ♦ Adam's Mark ♦ Ch2MHill
  ♦ Holme Roberts & Owen ♦ IBM Women in Technology ♦ Raytheon
  ♦ Ball Aerospace ♦ DMJM Aviation, Inc. ♦ Gay and Lesbian Fund
  ♦ Merrick & Company Women Engineers ♦ Washington Group
  ♦ Sun Microsystems ♦ Rockwell Automation ♦ Frontier Airlines ♦ Key Bank
  ♦ TCF National Bank ♦ UMB Bank ♦ US Bank ♦ Wells Fargo
  ♦ Scanlon Consulting Services, Inc. ♦ Martin/Martin, Inc. ♦ Hire Potential

IMPACT:

- In post-program survey (87% return rate), 81% of girls stated the event was fun
- Over 81% stated that they learned more about engineering/technology fields
- Over 62% indicated an increased level of interest in science, engineering, or technology careers
- Channel 2 News Coverage
- 2003 Corning and Exxon Mobil Career Guidance Program Awards

Quotes from Attendees …



"If it is true that it takes a community to raise a child, then it follows that it takes a like-minded group of school-community partners to raise an educated child…and to change status quo." – John Appelhans, **Skinner Middle School Counselor**

"We loved the event. Well worth it for us, even if the drive was long. The girls are already telling their friends about it. I heard one of my students say that she always thought she would be a teacher, but after yesterday she will explore the idea of veterinary medicine or forensics! I think that is fantastic! Thanks so much!
Joni Wilson – Canon City MS Teacher

"Thank you so much for everything… It was so exciting to see our girls arrive back to school with such energy. They all had a wonderful time! Including the teachers…they just went on about the conference." – **Liliana, Vikan MS Teacher**

"I enjoyed all the activities you had and this program really put the engineering world in perspective for me. You made me realize how little women were a part of this, and how we should join together and make our mark in the engineering business." – **Sarah, Skinner MS Student**

"I just wanted you to know that the girls had a wonderful time. They can't stop talking about the things that were presented. Thank you, as an educator, for providing an avenue for girls to try things that bring what we try to do in the classroom to life. Please convey my gratitude to all that helped put this event on, how much they had an impact on our girls.
Bill Leaming - Horizon MS Teacher

"This conference really encouraged me to try to think about what opportunities we have in life. After this day, I got really more into life with science and technology." **– Ilor, Skinner MS Student**

EXECUTIVE SUMMARY

SUMMARY OF SUCCESS

The second annual *Girls Exploring Science, Engineering & Technology (GESET)* event was a huge success. Highlights are summarized below. Planning details and statistics are included in this report.

Over 2,200 registrations were received for 800 available spaces for middle school girls. Confirmed registrations totaled 816 middle school girls. In addition, there were over 85 chaperones in attendance with the girls. These statistics are what both amaze and sadden us. We had to turn away almost twice as many girls as we could accommodate due to lack of funding.

Fundraising efforts by the planning committee raised $38,700 from 14 organizations and individuals. Expenses totaled $38,137. Remaining funds will be held over for the 2005 event. Several companies, including the Adam's Mark Hotel and Agilent Technologies, provided in-kind services valued at over $20,000.

The complete list of sponsors includes: Lockheed Martin; Agilent Technologies; Adam's Mark; Ch2MHill; Holme Roberts & Owen; IBM Women in Technology; Raytheon; Ball Aerospace; DMJM Aviation, Inc.; Gay and Lesbian Fund; Merrick & Company Women Engineers; Washington Group; Sun Microsystems; Rockwell Automation; Frontier Airlines; Key Bank; TCF National Bank; UMB Bank; US Bank; Wells Fargo; Scanlon Consulting Services, Inc.; Martin/Martin, Inc.; and Hire Potential.

Over 150 volunteers provided invaluable support to the event mostly as mentors, and as coordinators and support staff. The planning committee consisted of 12 individuals from the hosting organizations.

Seventeen exhibitors shared information about programs or resources for girls. The exhibitors included: Girls Inc.; American Council of Engineering Companies of Colorado; Colorado MESA; Colorado School of Mines Women in Science, Engineering and Mathematics; Denver Public Schools; DeVry University Summer Scholars Program Ethnic College Counseling Center; Girl Scouts - Mile Hi Council; Hamilton Middle School TEAM C; Junior Achievement of Rocky Mountain, Inc.; Lockheed Martin; National Society of Black Engineers Alum, Denver Future City Competition; Project Lead the Way Kennedy High School; Society of Women Engineers Rocky Mountain Section; University of Colorado at Denver; University of Colorado at Boulder Women in Engineering Program; University of Denver Making of an Engineer Program; Women's Bureau/USDOL.

A survey was provided at the conclusion of the event. Over 87% of the girls turned in a completed survey in addition to 64% of the chaperones and volunteers. Over 81% of the girls agreed that the event was fun and over 81% said they learned more about engineering and technology careers due to the event activities. Over 62% of the girls indicated that this event has increased their interest in pursuing a career in engineering or technology. Practically all of the adult respondents (99%) agreed that the event was valuable for the students. Over 76% of the adults agreed that as a result of the event, students will be more likely to enter science, engineering or technology classes in high school.

This annual event is repeated each February to support National Engineers Week and the *Introduce a Girl to Engineering* Program. The hosts have already agreed to again co-host the event in 2005, as well as setting higher goals for fundraising and attendance. An additional host has also been added – Agilent Technologies.

In comparison with the 2003 event, we:

- ✓ Increased funding by 45% ($38,700 vs. $26,750) and increased in-kind donations by 33% ($20,000 vs. $15,000).
- ✓ Increased registrations by 100% (2,200 vs. 1,100) and increased attendees by 39% (816 vs. 585).
- ✓ Increased chaperones by 13% and increased volunteers by 7%.
- ✓ Increased the number of exhibitors by 21%.
- ✓ Received event coverage on the Channel 2 evening news.
- ✓ Received both the 2003 Corning and 2003 Exxon Mobil Career Guidance Program Awards

THE ISSUE

Girls of today are presented with gender biases and stereotypes that sometimes steer them away from careers or interest in the fields of math, science, engineering, computers and technology. Consider also a 1998 Harris Poll, conducted for the American Association of Engineering Societies and co-sponsored by IEEE-USA, which painted a bleak picture of engineering's public image. Less than 30 percent of respondents thought that engineers care about the community, and only 20 percent thought that engineers improve our quality of life.

We are working to change those perceptions. A coalition of organizations and businesses has come together to provide a space for girls to explore, to question, to do, and to learn. The girls walk out of this event inspired by the wonders of technology, and inspired by the incredible people who hold positions in those fields today. The girls learn about careers that support the very communities in which they live and improve our quality of life.

In an effort to squelch the stereotype that women aren't suited for technical professions, middle-school girls from across the Denver metro area convened to explore the real-world experiences of women in science, engineering, and technology. As part of National Engineers Week and the *Introduce a Girl to Engineering* program, some of Colorado's leading women professionals in science, engineering and technology introduced networking and mentoring basics in interactive workshops of 20 to 40 girls each.

Participants in the workshops experienced hands-on lessons in everything from forensic science and developing adaptive technology for people with physical limitations, to creating websites and constructing and programming computer robots made of LEGOS. (A complete list of workshops is included at the end of this report.)

Consider:

- Only 4 percent of Colorado girls specify engineering and 1 percent specify computer science as career interests on SAT tests.
- While women make up 46 percent of the Colorado labor force, they hold only 25 percent of positions in technical professions.
- Less than 10 percent of American engineers are women.

Currently, women, minorities and people with disabilities represent two-thirds of the American workforce, yet they are only a small fraction of those working in science, engineering, and technology. This means that the largest portion of the workforce continues to be isolated from these careers.

If women, underrepresented minorities, and persons with disabilities participated in the U.S. science, engineering, and technology workforce in parity with their percentages in the total workforce population, it would give America almost all the qualified workers it will need.

A recent report notes that the representation of women in college-level computer studies has actually declined in the last two decades, from 37 percent of undergraduate degrees being awarded to women in computer science in 1984 to only 20 percent in 1999. [1]

Women earned about 38 percent of all science and engineering master's degrees awarded in 1996, but were noticeably underrepresented in engineering. While 53 percent of master's degrees in biological science went to women, for example, women currently earn only 20 percent of those in engineering – up from 2 percent in 1975. Further, women earned 51 percent of the doctorates in the social and behavioral sciences and 42 percent in biology, but only 12 percent in engineering. [1]

African-American, Latino, and American Indian students now make up 11 percent of U.S. engineering graduates. According to U.S. Census Bureau projections, minorities are expected to make up close to 40 percent of college student bodies by 2020.[1] How many of them will choose science, engineering or technology degrees?

The report from the Commission on the Advancement of Women and Minorities in Science, Engineering and Technology (CAWMSET) Development outlined a set of action-oriented recommendations to encourage more women into the engineering profession, which could dramatically improve the situation-and the investment would be worth it, literally. Studies show that every dollar appropriately invested in preparing the workforce yields four to five dollars in economic benefits to the nation.

If, on the other hand, the United States continues failing to prepare citizens from all population groups for participation in the new, technology-driven economy, our nation will risk losing its economic and intellectual preeminence.

A key factor of the problem is that when young women enter college, many do not have sufficient math and science backgrounds to major in engineering. The reasons are many, including a serious deficiency in educational resources, social pressure resulting from the negative social image of scientists and engineers, a lack of encouragement (coupled with active discouragement), the dearth of out-of-school science, engineering and technology experiences for girls, and the lack of women role models in the profession.[1]

Too many highly capable girl students do not receive adequate math and science education, or drop out of math and science studies in high school or between high school and college. The solution? Aggressive, focused intervention efforts at each educational stage and transition: *Girls Exploring Science, Engineering & Technology* and the *Introduce A Girl to Engineering Day* Program are precisely that type of effort. We must help kids – especially girls and underrepresented minorities – connect science, engineering and technology to a better world.

“Most girls lose interest in technology in middle school,” said Sandra Scanlon, Event Chair, Society of Women Engineers, Rocky Mountain Section. “Many have exceptional skills in math and science but somehow get the idea that women aren’t welcome in technical professions. This event is designed to head off such impressions at an early age and show that science, engineering and technology are fun.”

[1] Statistical data taken from “Girls, Women and the Engineering Profession” brochure by Dr. Patricia Campbell, funded by the Office of Educational Research and Improvement at the U.S. Department of Education. The brochure is part of a series titled, “Encouraging Girls in Math and Science.” Other data taken from National Action Council for Minority Engineers (NACME).

EVENT DETAILS

There were three components to the event: The **Welcoming and Opening Remarks** set the stage for what the girls could expect to accomplish and enjoy throughout the day. Three **Interactive Workshops** focused on hands-on activities and demonstrations of various areas of science, engineering and technology. Lastly, at **Lunch** everyone convened for closing remarks and door prizes. Each student received a T-shirt and a tote-bag full of information on careers in science, engineering and technology; information on necessary courses to take in high school; scholarship and career guidance information from local minority and engineering organizations; as well as pens and other give-aways.

EVENT MISSION

To combine female middle school students, parents, teachers, and counselors with science, engineering and technology professionals in order to create a unique learning experience for all involved and to get pre-college students excited about math, science, engineering and technology.

EVENT OBJECTIVES

- Introduce female middle school students (middle school as defined by each school district) to real world aspects of science, engineering and technology and to the many diverse fields available.
- Give female middle school students, their parents, teachers, and counselors a chance to interact with engineering and technical professionals to show engineering and technology is fun.
- Introduce networking and mentoring basics to female middle school students.
- Introduce students, parents, teachers, and counselors to the local organizations within the science, engineering and technology community and the programs and resources available.
- Provide an opportunity for local companies, their employees, and the community to come together and support students to succeed in math and science.

IMPACTS / EXPECTED RESULTS

The overall goal of the event was to introduce science, engineering and technology careers to girls who may not otherwise be exposed to role models in these careers. Additionally, the importance of math and science were explained and presented as “cool” subjects in school.

The whole event served as a source of information on science, engineering and technology for a group of students who may not have much contact with engineers or scientists, and in particular women in those fields. This will also give us a chance to expose teachers and counselors to the fact that women can become engineers and scientists, and hold jobs in technology fields. Interacting with industry can provide them with information on what courses students need to take in order to pursue a science, engineering or technology education.

SPONSOR OBJECTIVES

- Stress the importance of math and science classes in middle and high school, in order to prepare for a college major that can lead to a well-paying job.
- Give the students and professionals a chance to learn and practice mentoring, which will hopefully encourage engineers, especially women, to attain high levels of professional achievement and to become role models.
- Feed the science, engineering and technology employment pipeline.

Sponsorships were solicited from 2003 event supporters and local companies. We decided not to pursue funding from the foundations that sponsored us in 2003 due to the impact the economy has had on non-profit contributions. We made a conscious effort to seek corporate support instead, with the exception of the Gay & Lesbian Fund, whom we had already applied for a grant prior to our decision. The sponsor prospectus is shown in Appendix A.

Our senior level sponsors were Senior Sponsors: Lockheed Martin, Agilent Technologies and the Adam’s Mark Hotel. Our junior level sponsors included Ch2MHill. Sophomore sponsors included: Holme Roberts

& Owen, IBM Women in Technology Program and Raytheon. Our freshman sponsors were: Ball Aerospace; DMJM Aviation, Inc.; Gay and Lesbian Fund; Merrick & Company Women Engineers; Society of Women Engineers Rocky Mountain Section; Washington Group International, Inc.; Sun Microsystems; Rockwell Automation Denver Branch; Frontier Airlines; Key Bank; TCF National Bank; UMB; US Bank; Wells Fargo; Scanlon Consulting Services, Inc.; Martin/Martin Inc.; and Hire Potential.

ATTENDEE SURVEYS

From the student and adult surveys, it is evident that the sponsor objectives were met. Complete reports analyzing the student and adult surveys are available separately from this report. The summaries from each of those reports are repeated below.

The Alliance for Technology, Learning, and Society (ATLAS) Evaluation and Research Group at the University of Colorado at Boulder helped to refine our surveys from last year. In addition, they administered the surveys and tabulated the results, which are included in their comprehensive reports. The major findings and recommendations will be very helpful to improve this event and provide even more targeted workshops and information to encourage girls to explore science, engineering and technology careers as well to enroll in more math and science classes.

The ATLAS Evaluation and Research Group at the University of Colorado at Boulder conducts research on increasing under-represented groups in IT disciplines. Kathy Garvin-Doxas and Lecia Barker, Research Associates in the ATLAS Evaluation and Research Group, coordinated the surveys and analysis for the *Girls Exploring Science, Engineering & Technology* event. They are the recipients of two National Science Foundation grants to study 1) curricular programs of study in higher education, in particular, the nature of learning environments in different curricular programs and 2) the types of messages and methods that can successfully persuade middle school girls to participate in computing programs of study.

The ATLAS Evaluation and Research Group at the University of Colorado at Boulder, led by Vice Provost Bobby Schnabel, is the newest institute on the CU-Boulder campus (first in many years, in fact) and as their web site notes, they provide "multidisciplinary curricular, research, and outreach programs that integrate information technology with a wide variety of disciplines and people, both inside and outside the university." (http://www.colorado.edu/atlas). They are also founding the National Center for Women and Information Technology, in collaboration with the Anita Borg Institute (formerly Institute of Women in Technology), a number of universities, corporations, and the Girl Scouts of the USA (among others). (http://www.ncwit.org) The Society of Women Engineers has a memorandum of understanding with the Girls Scouts of the USA to support outreach activities geared towards math, science, and engineering.

STUDENT ATTENDEE SURVEYS

The 2004 GESET event was successful at achieving two of its main objectives, including getting girls interested in pursuing careers in science, engineering, and technology and helping adults learn strategies for persuading girls to enroll in science, engineering, and technology classes. Below is a summary of the major findings from the GESET 2004 girls' survey and recommendations and ideas for GESET 2005.

Major Findings:

- 62 percent of the girls reported that because of attending GESET, they were either interested or very interested in having careers in science, engineering, or technology.
- 81 percent of the girls thought the event was fun or very fun.
- 81 percent of the girls reported having learned about science, engineering, and technology careers.
- Eighth graders rated the event as less fun and reported learning less about careers than sixth or seventh graders.
- 49 percent of the girls reported learning which high school courses they should take in order to pursue a science, engineering, or technology career.
- 81 percent of the girls believe that everyone will need to know how to use computers when they grow up.

- 42 percent of the girls reported liking particular workshops the best because they were hands on, active, or engaging.
- Canines in Law Enforcement, The Visible Human Project, and To Catch a Thief were the girls' three most favorite workshops.

Recommendations and Ideas for GESET 2005:

- Include more hands-on, engaging activities or especially good speakers with whom the girls can identify. Activities will be more successful if they are inherently interesting to girls.
- Develop workshops or activities that align girls' interests as well as science, engineering, and technology. Examples might include programming a computer-based girl to try on clothes; demonstrating the chemistry underlying hair dyes and the chemical effects of dye on hair; developing robots that can play soccer; explaining the computing embedded in instant messaging or cell phones; teaching girls to use the drag-and-drop programming language "Alice" to create a girl that skates or does some other interesting activity; the ideas are limitless.
- Focus enrollment on sixth and seventh grade girls, explicitly discussing how science, engineering and technology careers align with their existing interests as well as the messages they get that keep them out of such careers (e.g., girls are ditzy, only geeks do …, girls who are smart can't be attractive to boys, etc.).
- Make it "okay" to not like math. However, emphasize that every endeavor will have elements that people like and that they do not like. Therefore, even if a girl does not like mathematics, she will need to know how to apply it to solve problems. Finally, let girls know that it is a myth that boys are better at math than girls, but it is true that girls lose confidence and are harder on themselves when they struggle to learn something.
- Fund a study to track a cohort of girls into high school and beyond in comparison with a control group of similar girls who do not attend the event to understand the long-term effects of attending.

ADULT ATTENDEE SURVEYS

From an adult perspective, the 2004 GESET event was successful at achieving its main objectives including, getting girls interested in pursuing careers in science, engineering, and technology; and helping adults learn strategies for persuading girls to enroll in science, engineering, and technology classes. Below, is a summary of the major findings from the GESET 2004 adult survey and recommendations for GESET 2005.

Major Findings:

- Approximately 99% of adult respondents either agree or agree strongly that the event is valuable for the student participants.
- Approximately 57% of adult respondents either agree or agree strongly that students learned more about what types of high school classes they should take to enter into science, engineering, and technology.
- Approximately 76% of adult respondents either agree or agree strongly that as a result of the event, students will be more likely to enter science, engineering, or technology classes in high school.
- Approximately 76% of adult respondents either agree or agree strongly that the girls learned strategies they can really use for participating in science, engineering, and technology classes.
- Approximately 71% of adult respondents either agree or agree strongly that they learned some strategies for persuading girls to enroll in science, engineering, and technology classes.
- Approximately 91% of adult respondents either agree or agree strongly that the workshops represented the diversity of science, engineering, and technology careers.
- Approximately 97% of adult respondents either agree or agree strongly that the event is worth their time as a chaperone or volunteer.
- Approximately 90% of adult respondents report that they would participate next year.
- Approximately 55% of adult respondents report that they need between 3 and 6 weeks to prepare for a field trip like this.
- It is unclear whether or not the adult respondents believe that the organizers should limit the number of students form each school next year.

Recommendations for GESET 2005:

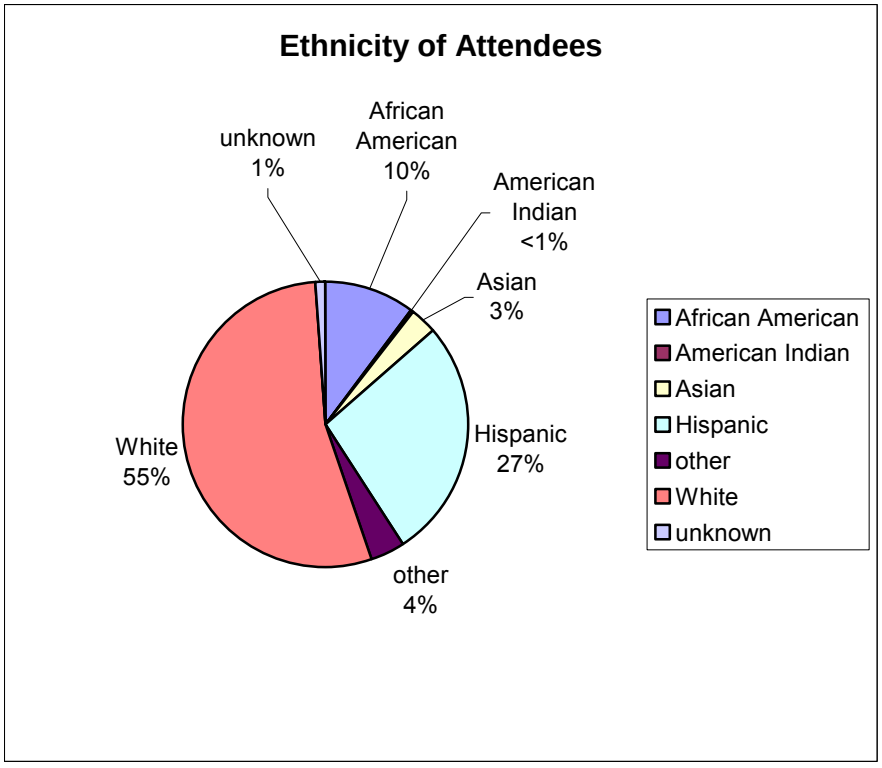
- Focus on enrolling a higher proportion of 6th grade girls.
- Accommodate as many girls as possible from each school.
- Enroll girls based on substantive criteria.
- Plan more hands-on workshops.
- Include a keynote speaker.
- Solicit schools at least five to six weeks before GESET 2005.

REGISTRATIONS

One improvement over last year is that we implemented an on-line registration system. Registrations were still received on a first-come first-served basis, but through the on-line system. Schools that attended the event in 2003 were placed on a wait list to allow first timers to attend the event. A Denver Public Schools high school student developed the on-line registration web page and programming to allow for teachers and parents to register students on-line. Denver Public Schools supported his efforts and SWE-RMS gave him a gift certificate in appreciation. There were some minor glitches in the process, which will be worked out for the 2005 event.

Approximately 2,200 registrations were received for this event (an increase of 100% over 2003), the majority of which were newcomers. This is an overwhelming amount of desire for an event such as this. For the second year in a row, we had to turn away more attendees than we could accommodate due to lack of funding. We also had to limit the number of chaperones and volunteers to stay within budget.

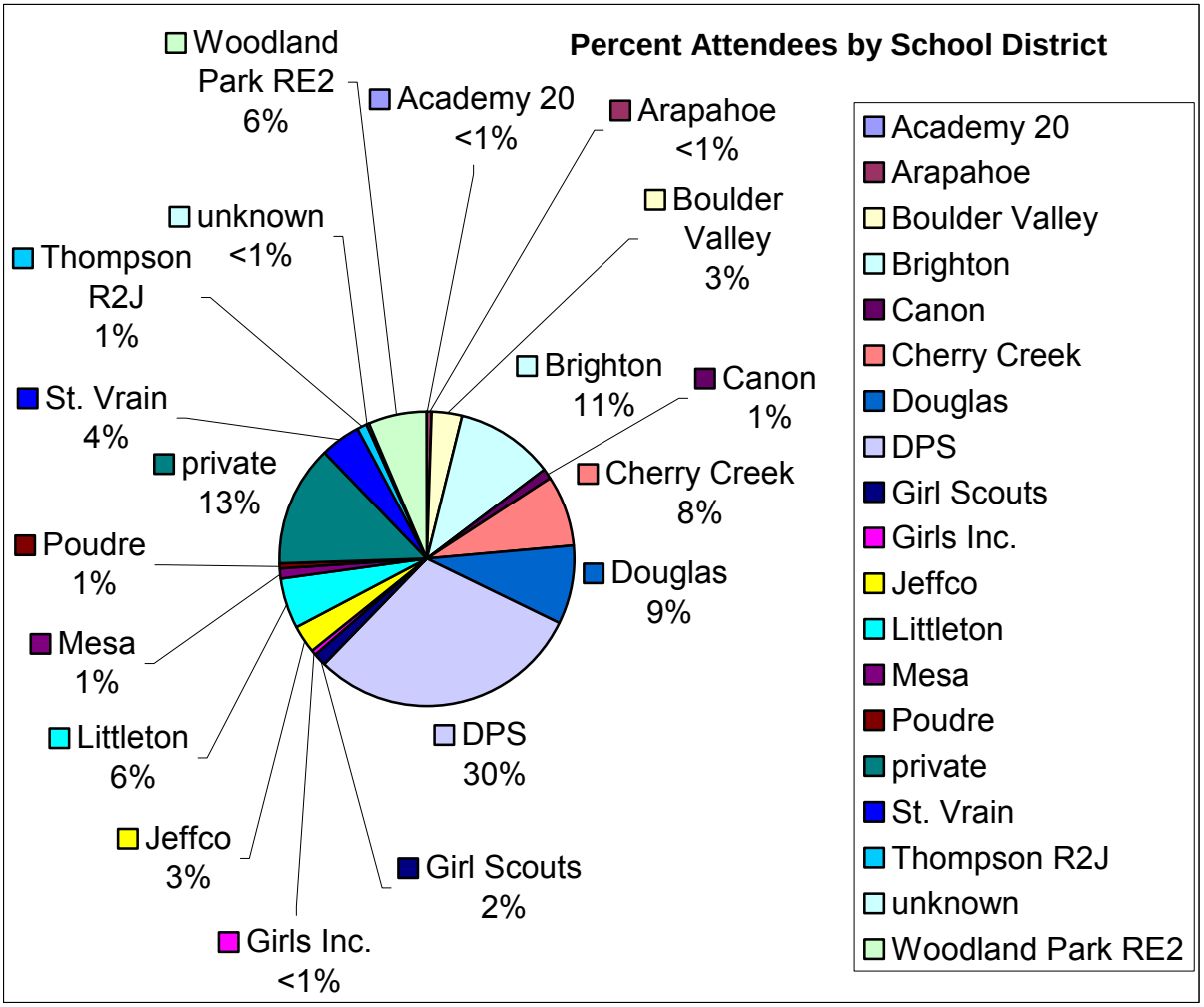
Of the 816 girls registered, over 45% specified a demographic other than white. This information was voluntary, and as such we did not receive demographic information from 1% of the registrants.



Compared to the Race/Ethnicity of Colorado school children, Latina/Hispanic girls were slightly under-represented while African-American girls were over-represented. Compared to the demographic makeup of Denver Public Schools, white girls were over-represented, while Latina/Hispanic and African-American girls were under-represented.

By comparison, in 2003 we had over 46% specify a demographic other than white and demographics for 12% of the 2003 attendees were unknown.

Of the 816 student attendees representing more than 49 different schools, over 29% were from students in the Denver Public School (DPS) system. Brighton Public Schools registered 10%. The remaining 17 school districts or groups that registered each had between 1 and 10%. Of those registered, 39% were 8th graders, 31% were 7th graders and 30% were in 6th grade. By comparison, in 2003, we had 585 girls from over 20 schools with 75 chaperones.



FUNDING AND BUDGET

In comparison with the 2003 event, we:

- ✓ Increased funding by 45% ($38,700 vs. $26,750)
- ✓ Increased in-kind donations by 33% ($20,000 vs. $15,000)
- ✓ Increased registrations by 100% (2,200 vs. 1,100)
- ✓ Increased attendees by 39% (816 vs. 585)
- ✓ Increased chaperones by 13% (85 vs. 75)
- ✓ Increased volunteers by 7% (150 vs. 140)
- ✓ Increased the number of exhibitors by 21% (17 vs. 14)
- ✓ Received event coverage on the Channel 2 evening news
- ✓ Received both the 2003 Corning and 2003 Exxon Mobil Career Guidance Program Awards

We do not charge any admission to this event. We rely solely on sponsors, in-kind donations, and volunteers. Therefore, several items were eliminated from the program planning or event in order to stay within budget. We eliminated the "save the date" mailing. This turned out to be unnecessary anyway based on the overwhelming number of registrants. We will not need to reinstate this item in the future.

We were able to secure donated tote bags therefore, allowing us to eliminated bags from the budget. We will continue to seek sponsorship for this item in the future.

Once again, we had to delete coffee service for the volunteers. However, the Adam's Mark graciously provided this for us this year. Comments from the adult surveys indicated the chaperones would like coffee as well. This is a perk we feel will need to be budgeted for in the future as a way of thanking the numerous volunteers and chaperones for their time and efforts.

Lastly, we invested in LEGO Mindstorm™ robotic kits this year, which will not have to be budgeted for in the future. The SWE Rocky Mountain Section purchased eight kits, to be used annually for this event, as well as for other career guidance activities. We struggled last year to borrow enough kits for one workshop. If event space allows, we can offer two concurrent LEGO robotics workshops with the eight kits we now own.

PROGRAM SCHEDULE Monday, February 23, 2004

- 8:45 a.m. – 9:30 a.m. Registration/Information for all participants with light breakfast.
- 9:30 a.m. – 9:50 a.m. Welcome/Opening Remarks by Keynote Speaker.
- 9:55 a.m. – 12:25 p.m. Workshops including hands-on demonstrations and activities.
  - 9:55 a.m. – 10:40 a.m. Various workshops within each Area of Interest.
  - 10:45 a.m. – 11:30 a.m. Various workshops within each Area of Interest.
  - 11:35 a.m. – 12:20 p.m. Various workshops within each Area of Interest.
- 12:20 p.m. – 1:00 p.m. Lunch/Closing Remarks/Door Prizes.

Our keynote speaker was Shan Carr, Director, Diversity Workforce Management for Lockheed Martin Corporation. Shan has responsibility for the development and implementation of the corporate diversity strategy, programs, and policies that support and enhance the organization's focus on the recruitment, development and retention of top talent for a diverse workforce.

Shan provided a very engaging and upbeat presentation. She had several members of the audience come up on stage to help her illustrate her points. Over 81% of adults surveyed agreed that we should provide a keynote speaker next year. The recommendation, however, is that the keynote speech should be shorter and engage the audience in collaborative and active learning.

PROGRAM PARTICIPATION BY STUDENTS

Two other elements new to the event this year were the Great Women in Science, Engineering and Technology Essay Contest and a presentation to the entire conference by middle school girls. These two elements were added to increase participation in the event and also to provide another opportunity for

students to learn about other women (and girls) who love and excel in math and science, and are making a difference in the world.

Great Women in Science, Engineering and Technology Essay Contest

The GESET Essay Contest is a variation of the Society of Women Engineers Rocky Mountain Section (SWE-RMS) Great Women in Engineering and Science Essay Contest for 6th grade girls and boys. (Any 6th grader can participate in the SWE-RMS contest and win prizes. The contest is advertised on the SWE-RMS website at http://www.swe-rms.org/). Participation in the event essay contest was voluntary, but intended to be used as a pre-event activity. Attendees chose one of the following women engineers or scientists to write a 500 word essay: Caroline Lucretia Herschel, 18th-19th Century German Astronomer; Sophia Kovalevsky, 19th Century Russian Mathematician; Irene Joliet-Curie, 19th-20th Century French Physicist; Bonnie Dunbar, 20th Century American engineer and Astronaut; Lillian Moller Gilbreth, 19th-20th Century American Home Economist; and Dorothy Mary Crowfoot Hodgkin, 20th Century British Biochemist.

The winning essays described the woman's life, achievements and any awards she received in recognition of her work; demonstrated an understanding of the significance of her work; showed originality; included three or more research sources from varying media (bibliography); and used correct grammar, spelling and punctuation.

Three prizes were awarded in each grade level (6th, 7th and 8th). The winners all came from different schools, with the exception of two. We only received 28 essays, however, the materials did not go out until 3 weeks prior to the event, which may have attributed to the low participation. Several teachers mentioned that more time was needed and suggested sending out the information with the registration information.

Team C Presentation

For the second year in a row, the girls from Technology Exploration in Art, Music & Computers (TEAM C) at Hamilton Middle School, Denver, participated in the event. At the 2003 event, the girls had an exhibit showcasing their computer programming skills in a variety of demonstrations shown on a computer at the exhibit. This year, in addition to their similar exhibit, they presented a short skit to the entire group of over 800 girls and 200 adults during lunch. The girls talked about stereotypes and the myths surrounding them; how you can still have a life even if you are smart and love school or your job; how anyone can learn about computers; and to get involved in math, science, and computer classes – bring a friend and use your teachers for support.

The presentation was well received, however, it was a little distracting to have the audience eating lunch while the girls spoke. The 2005 event will try and incorporate a group of girls speaking to the audience or presenting a workshop, since the impact of peer involvement is crucial to encouraging young girls to pursue math and science classes.

EXHIBITS

In order to provide an avenue for the chaperones to learn about local organizations within the science, engineering and technology community, an exhibit area was again provided. We increased the number of exhibitors from 14 to 17 and included the following organizations: Girls Inc.; American Council of Engineering Companies of Colorado; Colorado MESA; Colorado School of Mines Women in Science, Engineering and Mathematics; Denver Public Schools; DeVry University Summer Scholars Program Ethnic College Counseling Center; Girl Scouts - Mile Hi Council; Hamilton Middle School TEAM C; Junior Achievement of Rocky Mountain, Inc.; Lockheed Martin; National Society of Black Engineers Alum, Denver Future City Competition; Project Lead the Way Kennedy High School; Society of Women Engineers Rocky Mountain Section; University of Colorado at Denver; University of Colorado at Boulder Women in Engineering Program; University of Denver Making of an Engineer Program; Women's Bureau/USDOL.

New for the event this year were short ten-minute presentations by the exhibitors in a common seating area near the exhibits. This aspect, however, needed more organization and advance notice to the chaperones. The chaperones were not aware of the presentations until check-in and the comments

indicated they were not certain what activities were available to them while the students attended their workshops. Feedback after the event indicated that this was a very valuable part of the event. The exhibitors networked among each other and made connections for future programming and collaboration. The chaperones indicated that they learned of valuable resources for future curriculum ideas, summer and after school programs.

HANDOUTS / GIVEAWAYS

Each attendee received a T-shirt when they arrived, sponsored by Lockheed Martin. The girls wore their T-shirts all day, which was a powerful visual when they were all together in the ballroom. The following items were sent home with each attendee in a nylon sport bag, donated by IBM, and included: an aerospace workbook "Dare to Dream" from Lockheed Martin; a 26-page "Explore Engineering Activity Book" complete with answers (this activity book was created by a SWE-RMS member and printed by Raytheon); "Three Cheers to Engineers," a popular student brochure reprinted from Girls' Life magazine, provided by Agilent; brochures listing what courses to take in high school; descriptions of various engineering disciplines; websites listing career guidance and scholarship information; and various trinkets (notepad, pens, pencil, highlighters) from sponsors; SWE Facts brochure. The chaperones each received the same items, plus "Hubble's Universe" activity CD and participant certificates for each girl from Lockheed Martin; "Is Engineering for You" brochure and "Engineer Girl" website flyer, both printed by Rockwell Automation.

To encourage the girls (and adults) to complete the post-event surveys, door prizes were offered. The door prize drawing was held at the end of the event and included: two roundtrip tickets on Frontier Airlines; a Space Monopoly™ game autographed by two astronauts including their photos; SimCity software game; Bronco thermal mugs filled with candy or Mary Kay Cosmetics; clipboards, and an autographed book by Jill Tietjen titled "Setting the Record Straight – The History and Evolution of Women's Professional Achievement in Engineering." The adult door prizes included a cordless mouse, a Party Lite gift basket, and Broncos Thermal mugs filled with candy or Mary Kay Cosmetics.

VOLUNTEERS

Our volunteer coordinator this year was also the volunteer coordinator for the 2001 SWE National Conference. She used her skills from managing hundreds of volunteers to develop a more detailed process to coordinate the 150 GESET volunteers.

The goal for the event was to provide one mentor (or guide) for every 10 girls. Due to budget constraints, we had to increase this to 15-20 girls per guide. Ideally, a 15:1 ratio or more is too high to allow personal interaction with each girl. Funding for the 2005 event must allow for a 10:1 ratio to make the mentoring experience more meaningful.

Volunteer support is an opportunity for the sponsoring companies to flourish. The majority of our volunteers come from the major sponsors. We had more volunteers come forward that we could utilize due to budget constraints. Usually, events or organizations struggle to recruit enough volunteers. Our success with volunteers is one more indicator of the power of this event and the desire by individuals and companies to encourage more girls to pursue math and science and ultimately feed the employment pipeline.

WORKSHOPS

Mission to the Planets: A Robotic Exploration Simulation
Don Brown, Ph.D, JPL Solar System Ambassador, Curriculum Coordinator, Aurora Public Schools

Here's the scenario: you are a scientist at NASA's Jet Propulsion Lab. A space probe has returned from a "grand tour" of the Solar System, bringing back samples from all of the planets. Unfortunately, micrometeorites hit the probe's memory core, wiping out all of the collection data. Can you use your knowledge and skills as a scientist to identify the samples? Also, view the best web sites to learn about space science.

Don Brown currently works as the Coordinator for Curriculum in Aurora Public Schools. In his education career he has taught K-12 music, regular elementary class, and college level courses. He received a Master of Arts in Teaching at Lewis and Clark College (Oregon), and is now working on a dissertation in Educational Leadership through the University of Oregon. Don has been a volunteer for NASA's Jet Propulsion Lab for the past 3 years as a Solar System Ambassador, through which he has done numerous presentations in classrooms and at public events in Oregon and Colorado. He is a presenter for the National Science Teacher's Association and an avid rocketry hobbyist.

Intellectual Property BINGO
Katheryn Jarvis Coggon, special counsel at Holme Roberts & Owen

What is intellectual property? Who has it? Who protects it? What is a copyright? What are trademarks, patents, and trade secrets? Why does it matter? What does it take to become an intellectual property lawyer? Explore, through a fun and interactive game, all aspects of intellectual property law. Learn why it is important to protect and respect intellectual property rights of others. Win fun prizes. Develop your own intellectual property: write a jingle and copyright it, draw a trademark, brainstorm a new patentable invention.

Katheryn focuses her practice on technical litigation, primarily in the areas of intellectual property and environmental law. She comes to the practice of law with experience in nuclear engineering. Katheryn led her college design team to national victory in the 1990 American Nuclear Society design contest for a beta/gamma field survey instrument. She also worked for Westralian Sands and the U.S. Department of Energy before attending law school. Katheryn is licensed to practice before the United States Patent and Trademark Office and is a member of the Society of Women Engineers.

Exploring Careers in IT (and how you can make a better Peanut Butter and Jelly Sandwich)
M. Elsbeth Sweeney, Manager of Printing Systems Division User Technologies, IBM Boulder, Boulder Chapter Lead: Women in Technology (K-12 initiatives)

The goal of this presentation is to introduce middle-school girls to microprocessors, by writing precise instructions on making a peanut butter and jelly sandwich. Once these instructions are written, the facilitator becomes the "robot" and follows the instructions, precisely as written. At the beginning of the presentation, the IBM facilitators will discuss careers in IT, as well as the importance of math and science, during their middle and high school years.

Ms. Sweeney manages a team in IBM that is responsible for the usability of software and hardware products. She manages software developers, graphic artists, human factors engineers, and technical writers. She has worked in many different divisions of IBM and began her career in Chicago, where she worked in advertising and public relations. She has worked in Boulder since 1977.

Veterinary Medicine: The challenge of medicine when they can't tell you where it hurts!
Bonnie Kramer, DVM

So you want to be a veterinarian! Come try to take a dog's blood pressure, look in his eyes and ears, listen to his heart, see x-rays and ultrasounds, and other things I use every day. We will talk about what you need to begin doing now, what the education requirements are, what it is like to be in veterinary school and how rewarding it is to be a practicing veterinarian.

Dr. Kramer graduated from Colorado State University in 1994 as a Doctor of Veterinary Medicine. She owns a small animal veterinary clinic in the Denver area and provides medical and surgical services to a wide variety of small animals (dogs, cats, ferrets, rabbits, guinea pigs, etc.). She is also a puppy raiser for Canine Companions for Independence, a non profit organization that enhances the lives of people with disabilities by providing highly trained assistance dogs and ongoing support to ensure quality partnerships.

"WHAT is in my Dog?"
Sara Mark, DVM

We'll be exploring how to diagnose big solid things inside of animals and how they get there,

by utilizing x-rays, a "palpation box" and supersaturated solutions that participants will turn into solids.

Dr. Mark owns a small animal veterinary practice in Littleton. She is a graduate of the Kansas State University College of Veterinary Medicine. Her passion is for Animal-Assisted Therapy, and she has helped numerous hospitals across the country establish programs to benefit their patients.

The Animal Control Officers' Role in a Cruelty Investigation
Christine Brooks, Animal Control Officer, Jefferson County Sheriff's Office Animal Control Section

Officer Brooks will present two cases involving horses in possible cruelty situations. We will be discussing how an investigation is conducted and what tools are required (i.e. digital photos, weight tapes, scoring systems). The group will be divided into smaller groups to determine the outcome of the cases using the materials provided.

Officer Christine Brooks has been assigned to Animal Control as an Animal Control officer and involved in animal cruelty cases for over three years. She holds a Bachelors of Science degree in Animal Science. In her personal life, she has been around many animals and has owned horses, ferrets, cats, and dogs.

Use of Canines in Law Enforcement
Jefferson County Sheriff's Office K-9 Unit (Teams 1 &2)

The Jefferson County Sheriff's Office K-9 Unit will demonstrate and discuss the various ways in which dogs contribute to law enforcement activities. The Sheriff's Office has 11 dogs which are trained in areas including narcotics detection, human tracking, cadaver detection, and explosive detection. Training the animals requires thorough understanding of their sense of scent, their strength, speed, behavior, demeanor and other factors. The dogs are an invaluable resource to law enforcement and they contribute skills that no human possesses.

The Jefferson County Sheriff's Office K-9 Unit is comprised of 8 deputies (three more are currently in training). Teams include: Deputy Barrick and Alko, Deputy DiLorenzo and Taso, Deputy Fosler and Sabre, Deputy Gardner and Muci, Sergeant Kleinschmidt and Sid, Deputy Milliman and Justice, Deputy Nelson and Emily and Marky, and Deputy Valbert and Vader.

Forensic Science with a Feminine Touch
Laurel Farrell, Agent in Charge, Colorado Bureau of Investigation; Jacqui Battles, Agent, Colorado Bureau of Investigation; Amy Beatty, Agent, Colorado Bureau of Investigation

You are the Crime Scene Investigator (CSI). A crime has been committed and you have to decide what evidence to gather from the mock crime scene. How observant are you? Could that glass fragment be important? What about the cigarette butt in the ashtray? See how many items of evidence you can list and compare your list to that of the CBI Laboratory Agent. You have identified a suspect and will collect and package their fingerprints. Remember to mark the evidence and all packaging to protect and identify it. Trace evidence often solves the crime. Learn to make a paper fold to collect trace evidence. Gather some trace evidence, package and label it properly. Learn about the education and training that is required to be a Laboratory Agent for the Colorado Bureau of Investigation as well as about other career opportunities in the field of forensic science.

The Colorado Bureau of Investigation has three crime laboratories located in Denver, Pueblo, and Montrose. 44 Laboratory Agents perform the scientific analysis of the evidence submitted by Colorado law enforcement agencies. All agents provide expert testimony in Colorado and Federal courts of law. Laurel Farrell is one of the Agents-in-Charge in the Denver Laboratory. She has responsibility for the Chemistry, Firearms, Toolmarks, Fingerprint, Shoe and Tire Track Impression, and Trace Sections. She analyzes case submissions in the areas of Chemistry and Trace - Glass. Prior to working for CBI, Laurel worked in the forensic toxicology field for 21 years.

Jacqueline Battles, a Laboratory Agent in Denver, has worked for the Bureau for over 25 years and analyzes case submissions in the areas of Chemistry and Trace - Glass, Paint, Gunshot Residue, and Physical Match. Prior to working for CBI, Jacqui worked for an analytical laboratory in Chicago and a metallurgy laboratory at the University of Denver.

Amy Beatty is a Laboratory Agent in the Chemistry Section of the Denver Laboratory. Amy analyzes substances for the presence or absence of drugs as well as submissions from clandestine drug laboratories. Prior to joining the CBI, Amy worked for 4 years as a forensic chemist at the Georgia Bureau of Investigation.

Do You Carry Water on Your Head?
Patsy Sullivan, P.E., Senior Project Engineer, Martin/Martin Inc.

Description: Do you like water? (plain or with a lemon?) Do you take showers? (do you need to take one now?) How can you take a shower when it's not even raining outside? Learn where our water comes from, how it gets to your house and what makes it safe to drink. See how gravity affects water. Piece together a water system. Operate a pump and a siphon. What kinds of jobs can a water engineer get? How much money can you make? What kind of education do you need? Can water engineers get on the Oprah show?

Ms. Sullivan is an Environmental Engineer with 11 years experience in water distribution and treatment, wastewater collection and treatment, water and wastewater pumping and site development. She holds a Bachelor of Science in Civil Engineering from the University of Illinois at Champaign-Urbana and is a registered Professional Engineer in the State of Colorado. Originally from Chicago, she moved to Denver in 1997. Her hobbies include yoga, swimming, comedy, writing, softball, hiking and movies.

Gumdrop Domes & Melting Peanuts: Engineers Solve Problems!
Deb Lasich, Executive Director, Women in Science, Engineering and Mathematics (WISEM) Program
Colorado School of Mines & Tricia Douthit-Paulson, Associate Director, Admissions Office
Colorado School of Mines

If you like to solve problems, you could be an engineer! Engineers solve problems using math, science, and technology. Students will have the opportunity to try out two different kinds of engineering. In the first activity, participants will experience what it's like to be a civil engineer by figuring out how to build a dome structure using only gumdrops and toothpicks. The second activity will show how materials science engineers help save the planet by developing materials that are environmentally friendly.

Deb Lasich is the Executive Director of the Women in Science, Engineering, and Mathematics Program at the Colorado School of Mines (CSM). She also teaches at the University of Denver and consults in the areas of leadership, professional development, and gender issues. Deb has a Masters of Community and Regional Planning from the University of Nebraska-Lincoln and a B.S. degree in sociology from Kearney State College.

Tricia Douthit-Paulson was a Kansas farm girl when she became interested in engineering. She's the Associate Director of Admission at CSM where she also received a B.S. degree in Metallurgical and Materials Science Engineering and is finishing a Masters of Science degree in the Advanced Processing and Products Research Center. She received the FIERF Forging Achievement Award and a National Science Foundation Summer Research Grant.

Assistive Technology: A Challenging Field Full of Fun!
Diane J. Brians, B.A., Department of Rehabilitation Medicine, Assistive Technology Partners, University of Colorado Health Sciences Center

Diane will provide an overview of what assistive technology is, and bring along some examples of assistive technology that is used by kids as well as adults. She'll talk about what a typical day looks like as an Assistive Technology Specialist and the type of degree people in our field may have. She'll talk briefly about the different settings that assistive technology specialists work in and leave time at the end for any questions the participants may have.

Ms. Brians is an Assistive Technology Specialist with 15 years experience and expertise in early childhood education and classroom adaptations. Ms. Brians worked at The Children's Hospital of Denver for 10 years in the Rehabilitation Department where she was involved with the Assistive Technology Clinics and Lekotek Toy Library. Today at Assistive Technology Partners Ms. Brians teaches and provides consultation to teachers in the schools regularly. Her main interest is in designing, producing

and teaching others about low-tech solutions for the home and classroom. Ms. Brians is the author of 2 books, **The PVC Book of Simple Possibilities** and **The PVC Book II: More Simple Possibilities**.

Agilent Workshops:
Agilent Technologies is once again providing employees' volunteer time and "Agilent After School" science kits; over 35 Agilent employees from across Colorado will lead approximately 400 girls in four hands-on-science activities that include:

The Steady Hand Game
Agilent Technologies

In this workshop, participants explore the fundamentals of electricity. They build an electrical circuit that includes an energy source, resistance, a light and a switch. The completed assembly is also a steady hand game that participants will have fun playing and demonstrating to family and friends.

Night and Day
Agilent Technologies

Participants will create their own model of the earth, spinning on its axis and changing its seasonal position relative to the sun. They will observe the cause-and-effect relationship that these movements have on our days and nights…our years…our lives.

Catch a Thief
Agilent Technologies

Students use investigative and problem solving skills to solve a crime. Using paper chromatography, students reveal the underlying composition of four suspects' pens. And, utilizing the same scientific process on the ransom note, they identify the criminal.

The Electronic Matching Game
Agilent Technologies

Students build an electronic game that enhances their knowledge of circuits and electrical flows. Students have the opportunity to create their own questions and answers and use the game board as an electronic checker for matching correct questions to answers.

Lead presenters are Marcy Montgomery, General Manager, Agilent Systems and Solutions Operations, and Jean Mooney, Agilent Colorado Government & Public Affairs Manager. Marcy holds an MBA from the University of Washington and has experience in Finance and Manufacturing Operations. She has worked for Agilent for 19 years. Marcy has a BA in Communications and Business from Texas A&M University and advanced studies at the University or Pennsylvania. She has worked for the Company for 11 years.

Engineering the Global Positioning System
Alison Brown, PhD, President and CEO, NAVSYS Corporation

The Global Positioning System consists of a network of satellites broadcasting signals that can be used for precise positioning and timing worldwide. Dr. Brown will talk about the design of the GPS system including the satellites, control segment and the GPS receivers themselves. The discussion will include some of the current applications of GPS and also what the future holds for the next generation of GPS systems. Workshop attendees will have the opportunity to operate GPS receivers and try out some of their capabilities in tracking the GPS satellites.

Dr. Alison Brown is the founder and President/CEO of NAVSYS Corporation, a small business in Colorado Springs, which specializes in developing next generation Global Positioning System (GPS) technology. She holds 5 patents related to GPS technology and has published over 100 technical papers.

Dr. Brown has a PhD in Mechanics, Aerospace, and Nuclear Engineering from UCLA, an MS in Aeronautics and Astronautics from MIT, and an MA and BA in Engineering from Cambridge University. She is currently a member of the International Women's Forum and has been recognized as a Mile Hi Council "Woman of Distinction" for her volunteer activities.

Space: The Final Frontier
Nate Carson, Business Unit Resource Manager, Lockheed Martin Integrated Systems & Solutions, Colorado Springs

We will use interaction with the students to go from point A to point B for commanding and controlling satellites; we will be illustrating the equipment that it takes to command and control the satellites. The students will act as the different equipment that it takes to command and control satellites, while someone narrates the equipment's key activities.

Nate Carson spent approximately 5 years as a hardware engineer installing mission control centers for commanding and controlling satellites in the late eighties. He was the lead Hardware Engineer for installing three modules for the Air Force at Falcon Air Force Base; now Schriever Air Force base in Colorado Springs. He now supports the hiring strategy for the skills required for several contracts for Lockheed Martin Integrated Systems & Solutions division of Lockheed Martin in the Colorado, Nebraska, New Mexico, and Utah locations.

Website Design and Development: It's NOT Rocket Science
Marjorie Alexander, Principal and Lead Web Developer, Two Hundred

The session will start with a discussion of what a website is and an overview of the technology that allows a website to appear on one's computer. Following that, participants will build a simple web page using Netscape Composer. One of the wonderful things about Web Development is that young people can learn it on their own (on the Web). It is NOT rocket science.

Marjorie Alexander became captivated by the Internet in 1993. Using a slow modem and an old browser, she began downloading and deconstructing websites to teach herself the technology. Over the past 11 years, as the technology of web development progressed, Marjorie continued to teacher herself how to use numerous software programs in order to build sophisticated web applications for many high-profile clients. Today, Marjorie is the Principal and Lead Web Developer for Two Hundred, a design firm specializing in websites for transportation-related projects.

The Visible Human Project: Exploring the Future of Virtual Anatomy
Lee Granas and Michelle Bagur, Programmers, Center for Human Simulation, University of Colorado

This workshop will include a short video on the history of the Visible Human Project. It will describe the latest innovations with surgical simulators, interactive programs for learning and teaching anatomy, and future possibilities. Participants will then dissect through a virtual cadaver on a computer as well as create anatomical animations. Participants will receive our latest anatomical animation flipbooks.

Lee Granas is a Colorado native. She got her start with the Visible Human Project back when she was a sophomore in high school. She began by helping to label the anatomical slices. Later, Lee attended the University of Colorado at Boulder on the Boettcher Scholarship and studied biology and computer science. She returned each summer to work as an intern for the project, learning more about computers and helping put together the first Visible Human Dissector program. Lee graduated from CU in December of 2001 and has been helping out with the project ever since.

Michelle Bagur received a Bachelor of Science in Computer Science from the University of Texas at Dallas and is currently working on a Masters in Integrated Science at the University of Colorado at Denver, focusing on Computer Science and Biology. Michelle began programs in the games industry in Dallas, working on PC and N64 systems. She now works as a programmer for the Center for Human Simulation.

Rockets' Red Glare
Tanya Apel, Lockheed Martin Corporation

Have you ever wondered how a rocket is produced and launched? During this hands-on workshop, students will explore the various stages of rockets, three types of satellites and the orbits in which satellites can be placed. Students will also get to build and launch their very own rocket! Prizes will be given to the rocket that flies the farthest!

Tanya Apel graduated in 1993 from the only student-managed, work college in the country, Blackburn College, with a BA in Biology with a minor in Chemistry. After college, Tanya began working for a small composites manufacturer, ensure quality products for aerospace, commercial and research purposes. In 1997, Tanya began working for Lockheed Martin in Harlingen, Texas in support of the Atlas Launch Vehicle Program. She now works at Lockheed's Denver, Colorado facility on the Boost Vehicle Plus program in support of National Missile Defense.

Robotics and LEGO Mindstorms
Brian Dino and Stacey Fornstrom, Denver Public Schools and Rebecca Ritter, Sun Microsystems

This workshop will provide an introduction to programmable robots by means of a programmable computer inside of a LEGO brick. Participants will construct a LEGO robot and then program it to navigate obstacles, follow trails or react to changes in light, directed by its sensors.

Brian Dino is a graduate of the University of Colorado at Boulder, and has been teaching at the Computer Magnet program at North High School in Denver Public Schools for three years. He teaches robotics, programming, web animation, databases and project management. He also teaches tennis, performs magic and is an alumnus of North High School.

Stacey Fornstrom is a teacher in the computer magnet program at Thomas Jefferson High School in Denver Public Schools. He holds a masters degree from Texas A&M, has taught at the high school level for four years and currently teaches databases and programming. Prior to teaching, Stacey was a computer consultant specializing in implementation and customization of business computing systems.

Digital Photography
Mike Mitchell, Mike's Camera

Earth Energy
Susan Morrice, petroleum geologist, Principal, Aspect Energy

Appendix A

"Girls Exploring Science, Engineering & Technology" Event February 23, 2004

Sponsorship Levels:

Freshman Sponsors $2,499 or Less:
Sponsors in this level will receive the following:
- Sponsor level listing in all advertising, program materials, posters, reports, website, etc.
- Sponsor level listing on table tents to go on all the tables in the ballroom for breakfast and lunch.
- A final report covering the event, including letter of appreciation, statistics and pictures.

Sophomore Sponsors $2,500 to $4,999:
Sponsors in this level will receive all benefits listed above plus the following:
- Sponsor level listing provided to all media covering the event.
- Podium recognition of sponsorship level.
- The sponsor's banner hung in the ballroom behind the stage for the event.

Junior Sponsors $5,000 to $9,999:
Sponsors in this level will receive all benefits listed above plus the following:
- An invitation to the SWE Rocky Mountain Section Awards and Recognition Banquet in June 2004 where sponsor will be recognized for supporting GESET. For more details regarding the 2004 SWE Awards and Recognition Banquet, visit the SWE website at www.swe.org
- A one-year subscription of SWE magazine donated on behalf of the sponsor to a school classroom chosen from a drawing at the event.
- Two complimentary tickets to The Women's Foundation of Colorado 2004 Annual Luncheon. For more details regarding this year's luncheon, visit the Women's Foundation of Colorado website at www.wfco.org

Senior Sponsors $10,000 or more:
Sponsors in this level will receive all benefits listed above plus the following:
- An opportunity to extend a personal welcome to the guests on behalf of the sponsor during breakfast.
- An essay contest award presented in the name of the sponsor. The sponsor may participate in the selection of the winning essay and present the winner with an award at the event.
- Four complimentary tickets to The KeyBank Denver Distinguished Lecture Series at Boettcher Concert Hall. Speakers include Queen Noor on January 20, 2004, General Tommy Franks on March 30, 2004 and Steve Forbes on May 17, 2004. For more details, visit the Junior Achievement website at jacolorado.org

Specific Sponsorship Opportunities:
As a sole sponsor of one of the following, the sponsor will have signage at the event indicating as such. Any printed materials, advertising, etc. will list this sponsorship as well.
- Breakfast sponsor $10,400
- Lunch Sponsor $23,300 - The sponsor may provide company logo stickers that can be placed on the boxed lunches or the sponsor may provide nylon lunch bags, which has the company logo and event name screened on them.
- A/V Sponsor $5,000
- Backpack Sponsor $12,000 - The backpacks may have the company logo, but the artwork must be approved by the host committee since it should also contain the event name and hosts of the event.

Other Sponsorship Opportunities:
Provide 1200 giveaways, one for each attendee and volunteer, with company name/logo on it. Giveaway sponsors will be recognized at the luncheon. Provide a handout to go in the bags for the attendees to take home. The handout could have their company info and logo, announce job opportunities or job line/website, and highlight philanthropic activities the company has sponsored in the local community or career guidance activities the company has sponsored or participated in locally.