



Santa Fe Fall
Expanding Your Horizons
STEM Conference for Young Women
5th-8th Grade
Saturday, September 19th, 2015
9:00-3:00

<http://www.expandingyourhorizons.org/conferences/SantaFe/>



Presented by:
NMNWSE and AAUW-Santa Fe



Summary Report

Prepared by
Kate Binns and Lina Germann, 2015 co-chairs

Mission:

The mission of Expanding Your Horizons (EYH) is to encourage young women to pursue science, technology, engineering and mathematics (STEM) careers. Through EYH programs, we provide STEM role models and hands-on activities for middle and high schools. Our ultimate goal is to motivate girls to become innovative and creative thinkers ready to meet 21st Century challenges.

Conference Schedule:

8:00-9:00	Check-in/ GUTS y Girls Games
9:00-9:40	Welcome and Keynote Speaker: Christa Brelsford
9:45-10:55	Session I Workshop
9:45-11:45	Adult Workshop
11:00-12:10	Session II Workshop
12:15-1:30	Lunch/Group Photo/Evaluation Return/Raffle
1:30-3:00	STEM Fair
2:30-3:00	Pick up in the Jemez Room

Keynote Speaker: Christa Brelsford (Santa Fe Institute)

Christa Brelsford is a postdoctoral fellow at the ASU/SFI center for Biosocial Complex Systems. At the Santa Fe Institute, Christa is looking for general patterns in the spatial properties of cities in order to solve problems about infrastructure access in slums and informal settlements. Christa holds a B.S. in Civil Engineering from Columbia University, an M.A. in climate science from Columbia University. She earned a Ph.D. from the School of Sustainability at Arizona State University, where her research focused on water conservation and the urban water system in Las Vegas, Nevada. Christa is also the reigning paraclimbing world champion and has an 18-month old son.



Workshops and Presenters

1- Nuclear Physics, Particle Physics, and You! (Leah Broussard)

In this delicious workshop, participants will mimic the effects of particle accelerators on edible models! Learn about atoms and their natural interactions and eat some sweet treats while doing it!

2- Bioenergy-Looking at Algae (Ondine Frauenglass)

Tour SFCC's Bioenergy lab and learn about algae's important role. You will collect biological samples, observe using a microscope, and make predictions based on your observations.

3- More than Dinosaurs! Paleontology for Conservation (Emma A. Elliott Smith)

Use fossils to recreate ancient mammalian populations in North America and use these models to compare current populations of mammals.

4- Binary Digits 0 & 1 to Supercomputers (Teri Roberts)

Learn everything from how computer circuits work to programming in this interactive workshop! You will look at how the physical components of a computer allow the programs to work (or not work!).

5- Intel Circuits and Coding (Andrea St. Clair and Allison Barnes)

Create your own circuits and see them work! Learn how to create scratch code and practice using it.

6- Physics of Toys (Ruth Howes and Nancy Watson)

Ever wondered how your favorite toys moved? Learn the physics of toys through hands on interaction and observations.

7- Why "empty" matters? (Kateryna Artyushkova and Linnea Ista)

What is a vacuum and how can we use vacuums to further our scientific knowledge? Learn about gravity, air resistance, and sound in space!

8- Insects and Spiders! (Linda Wiener)

Observe insects and spiders with a dissecting microscope. Learn how to draw a diagram and the major identifying features of some insects and spiders.

9- A World of Birds: Explorations in Ornithology (Samantha Funk)

Explore bird diversity and adaptation through hands-on exploration of study skins; bird bones, beaks, feet, eggs, and nests; practice their science and math skills in a guided owl pellet dissection; and learn about the major threats to birds and how they can help through engaging in Citizen Science.

10- Design Like Your Life Depends On It (Jacqueline Ulrich)

Participants will work in collaborative groups to learn about Net Zero design. You will use Net Zero design to solve a architectural dilemma with your design!

In addition we offered an Adult workshop attended by 15 teachers and parents on:

Diveristy Resources and Tools (Phyllis Baca)

National Alliance for Partners in Equity's (NAPE) Micromessaging: To Reach and Teach Every Student; Nontraditional Awareness, Mindset , Self-Efficacy, and Multicultural-Cultural Multi-Context theory.

STEM Fair Participants

Santa Fe Master Gardeners

Girls Inc.

Explora

Santa Fe Botanical Garden

Supercomputing Challenge

Christus St. Vincent

Project GUTS

Fractal Foundation

Santa Fe Watershed Association

Audobon Society

Santa Fe Alliance for Science

Computer Basics

Aviation and Aerospace

Nanofabrication

Toxicology

New Mexico MESA

New Mexico Tech - SWE

Geoscience

New Mexico Wildlife Center

MAKE Santa Fe

Santa Fe Institute

Deborah Farson

Rebecca Calhoun

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Josephine Kilde

Gina Hayes

Jen Dana

Beth Cammarata

Janet McVickar

Samantha Funk

Dean Gerber

Teri Roberts

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Laurenn Long

Becky Cocina

Christy Wall

Juniper Lovato

Juniper Lovato

Sponsors and Donors

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Santa Fe Alliance for Science
New Mexico EPSCoR



Supporters

Los Alamos Women in Science
Project GUTS
Whole Foods
James Rubow
Robert Everett

Also, many thanks to organizations that donated swag to the girls' bags!



SANTA FE INSTITUTE



This conference was brought to you by:

Santa Fe Fall EYH 2015 conference chairs:

Lina Germann, AAUW-Santa Fe
Kate Binns, Santa Fe Alliance for Science

Santa Fe Fall EYH 2015 Steering
Committee:

Shirley Aune
Ruth Howes
Ginger Richardson



With a special THANK YOU to our volunteers*:

Phyllis Baca, Tinka Gammel, Shelley Rossbach, Mary Coffman, Enid Tidwell, Tracy Sadler, Mary Susan Dryja, Jennifer Baker, Ellen Cerreta, Jan Frigo, Diane Oyen, Olivia Dippo, Margie Root, Cynthia Dobson, Ismael Gomez, Sandra Bradley, Anna Girdner, Sara Beroff, Nancy Scheer, Lynn Heffron, Luyi Yang, Jaylene Martinez, Gloria Martinez, Nanette Founds, Jennie Valdez, Esther Milnes, Luanne Moyer, Elizabeth Moyer, Anna Romero, Gail Dodge, Carrie Walker, Elizabeth Hunke, Lily Nathanson, Natalie Nathanson and ...

OpenEye Scientific volunteers: Iliana Toneva, Amanda Whitfield, Craig Bruce, Karen Thomas, Beatrice Montoya and...

Santa Fe Community College Student Ambassadors (4) and Freedom Ambassadors (3)

And to our wonderful photographer: Gabrielle Beans

And the STEM fair presenters (21 exhibits with one or more presenter at each)

Many thanks to our workshop presenters and keynote speaker. Without you we could not hold this conference! (15 participants)

Total number of volunteers: 67! plus an additional 21 exhibits at the STEM Fair.

*We apologize if we forgot anyone... or misspelled anyone's name.



Outcomes

Number of participants:

Student registered to attend: 186

Student participants (based on check-in at conference): 150

Student evaluation forms received: 146 (97% of participants)

Students receiving scholarship to attend: 20 out of 150 (13%)

Student receiving outside funding from schools/other organizations: 34 out of 150 (23%)

Adult workshop participants: 15 (teachers and parents)

Adult Volunteers total: 88 (includes pre-conference volunteers and STEM Fair exhibitors)

Demographics of student participants:

Demographic data on school of origin, grade level, and ethnicity of students collected from student evaluation materials completed onsite and pre-registration forms.

Table I: Represented Schools (Based on registration forms)

School	# of Girls	School	# of Girls
7 Bar Elementary	1	Mountain View School	6
Albuquerque Institute of Mathematics & Science	1	Nava Elementary	12
Alcalde Elementary	3	Nina Otero Community School	1
Amy Biehl Community School	2	Ortiz Middle School	10
Aspen Elementary	2	Pinon Elementary School	14
Atalaya	1	Pojoaque Schools	7
Academy for the Arts and Classics	2	Ramirez Thomas	1
Capshaw Middle School	3	San Juan Elementary	2
Carlos Gilbert	3	Sandia Vista Elementary	1
Chaparral Elementary	2	Santa Fe Girls' School	8
Cimarron Middle School	24	Santa Fe Indian School	14
Desert Academy	7	Santa Fe School for the Arts & Sciences	3
El Dorado Community School	6	Secondary Learning Center	2
Fayette St. Academy	4	St. Michael's High School	1
Gonzales Community School	4	Sweeney Elementary	9
Hernandez Elementary School	15	Tesuque Elementary	1
Kearney	2	Tierra Encantada Charter school	1
La Mariposa Montessori	1	Turquoise Trail Charter School	2
Los Alamos Middle School	3	Waldorf School	1
May Learning Center	2	Total Girls Registered by School	186

Table 2: Grade Level of Participants (Based on Evaluation Forms)

Some evaluations did not include grade level

Grade	Number of Participants	Percentage
5 th	47	35%
6 th	40	30%
7 th	29	22%
8 th	17	13%
Total	133	100%

Table 3: Ethnicity of Student (Based on Evaluation Forms)

Ethnicity	Response Count	Percentage
African American	3	2%
Asian	2	1%
Hispanic	49	34%
Native American	11	8%
White	40	27%
African American/Asian	1	0.6%
Hispanic/White	11	8%
Native American/Asian/White	1	0.6%
Native American/Hispanic	8	5%
No response	20	14%
Totals	146	100%

Socioeconomic status:

Of the 186 students who registered to attend, 41 (22% of those registered)) were granted full scholarships of \$10 to attend the EYH Fall Santa Fe conference. However 20 students out of those attended (13% out of 150) received the scholarship. In addition, 34 students or 23% of those attended received sponsorship from their school to pay for their registration fee. In total, 54 or 36% of girls who attended received some form of financial support to attend.

Evaluation of Conference Sessions

Keynote Speaker:

Table 4: Keynote Panel content rating.

Answer Options	Response Percent	Response Count
Boring	1%	2
Just OK	5%	8
Mostly Good	33%	48
Fantastic	45%	65
No Response	16%	23
Totals	100%	146

Workshops:

	<i>Physics of Toys</i>		<i>Why "empty" matters?</i>		<i>Insects and Spiders</i>		<i>A World of Birds: Explorations in Ornithology</i>		<i>Intel Circuits and Coding</i>	
	Percentage		Percentage		Percentage		Percentage		Percentage	
# of Responses	32		28		34		29		26	
Boring	0	0%	0	0%	1	3%	0	0%	0	0%
Just OK	0	0%	8	29%	11	32%	2	7%	0	0%
Mostly Good	8	25%	13	46%	13	38%	7	24%	7	27%
Fantastic	24	75%	10	36%	9	26%	20	69%	19	73%
No Response	0	0%	0	0%	0	0%	0	0%	0	0%
Difficulty Rating										
Too Easy	5	16%	2	7%	11	32%	3	10%	5	19%
Just Right	27	84%	24	86%	23	68%	26	90%	21	81%
Too Hard	0	0%	2	7%	0	0%	0	0%	0	0%
No Response	0	0%	0	0%	0	0%	0	0%	0	0%

Workshops (continued)

Workshop Title	Design Like Your Life Depends on It		Nuclear Physics, Particle Physics, and YOU!		Bioenergy: Looking At Algae		More than Dinosaurs! Paleontology for Conservation		Binary Digits 0 & 1 to Super Computers	
# of Responses		Percentage		Percentage		Percentage		Percentage		Percentage
Boring	0	0%	0	0%	0	0%	1	3%	0	0%
Just OK	7	23%	1	4%	0	0%	2	6%	2	6%
Mostly Good	9	30%	3	12%	6	24%	10	31%	12	39%
Fantastic	13	43%	21	84%	19	76%	19	59%	16	52%
No Response	1	3%	0	0	0	0%	0	0%	1	3%
Difficulty Rating										
Too Easy	5	17%	1	4%	0	0%	2	6%	3	10%
Just Right	22	73%	22	88%	22	88%	30	94%	27	87%
Too Hard	2	7%	1	4%	3	12%	0	0%	0	0%
No Response	2	7%	1	4%	0	0%	0	0%	1	3%

At the bottom of the first page of the evaluation form, we asked “Is there anything else you would like to share?”



Most were very positive:

- “Thank you! I can't wait to come again”
- “This is way more fun than I thought!”
- “It was wonderful. Please continue doing it and all of the programs that AAUW puts on like Tech Trek and Expanding your Horizons.”
- “This was my first time :) I want to come back! :)”
- “This made me feel like more girls can do STEM!”

A sample of responses to “What I expected was....” and What I got was....”

- “Not so fun and kinda boring” ... “So cool and fun and awesome”
- “I expected lectures and talks about different subjects” ... “Hands on Activities”
- “One big class”... “Hands on activities in small groups!”
- “To have fun and I did!”
- “Really hard and difficult to understand” ... “Fun and challenging, but hard.”



- “Something kind of interesting, but boring”... “Something incredibly interesting!”
- “To be bored, but I had fun!”... “How we can have fun with science”
- “To do experiments, and discover a lot” ... “Fun, Friend, and more knowledge”
- “Lots of girls everywhere” ... “Interacting with stuff and having fun”
- “Doing math problems”... “I learned about birds and houses. I made a new friend”
- “for it to be boring”... “a very good time”
- “I expected it to be more work and less listening and learning” ... “I really enjoyed learning about science that I haven't really studied yet”
- “To have fun and learn new things”...” what I expected”
- “People just talking”... “to do fun things”
- “To just watch videos about computers” ...”How to build and be creative with machines”
- “Everything that was done in bad classes”... “A better understanding of coding”
- “A bunch of boring speeches”... “a great day”



A sample of responses to “Next, I will.....”

Many girls:

- Wrote “do this again next year”
- Wrote “go home and try what I learned”
- Wrote “share what I learned with friends, family and/or school”
- Referred to the workshops they went to, such as Intel Circuits and Bioenergy, saying they want to learn more about specific things.

Individual responses:

- “Study more neutrons and electrons”
- “Tell everyone how good it was!”
- “Learn more about science.”
- “Beg my mom to do this again!”
- “I will look for bugs.”
- “Read about birds.”
- “I would like to find out other ways that science can be used to help people.”



Concluding Thoughts:

Our Fall 2015 Santa Fe Expanding Your Horizons conference can be viewed as very successful based on several metrics. The event drew incredible amount of interest from a diverse group of girls with respects to geographic, racial/ethnic, and socioeconomic characteristics.

- Our conference capacity was for 170 participants. 186 girls registered and more requested to register that we couldn't include!
- Students registered represented 39 different public, charter, and private schools from all over Santa Fe and the surrounding communities (Pojoaque, Los Alamos, Albuquerque, and Cimarron). Girls attending from Cimarron travelled over two hours to participate!
- With 27% of students identifying themselves as white and 14% with no response, we can safely assume that 59% of respondents were from underrepresented groups in STEM.
- A continuing trend has been a decreased request for scholarships - only 13% of attendees received registration fee waiver. Also of note, 23% of students were funded by an outside source such as their school or PTA. This brings the total number of students receiving financial assistance to 36% of registered participants. Even though \$10 registration fee seems affordable, we are hesitant to increase the registration fee as long as we can continue to rely on the generous support of our sponsors.



The mission of EYH is to encourage young women to pursue STEM careers by providing STEM role models and hands-on activities for 5th-8th grade girls. Based on evaluation responses, the Fall 2015 EYH Conference was successful in this mission! The majority of participants rated their workshop experience as “just right” and “fantastic.” To ensure that participants were able to receive the most appropriate level of sophistication, we made every attempt to group the participants by grade level. Most workshops had two groups: one of primarily 5th and 6th grade girls and the other of primarily 7th and 8th grade girls.



As previously mentioned, this year's conference had an overwhelming number of girls interested in participating! Parents and guardians were contacting us until the day of the conference trying to register their daughters. This indicates to us the importance of STEM events in the greater Santa Fe region.



Based on the participant responses, the event changed perceptions of STEM (96%) and STEM practitioners (74%) in a positive way, and 77% of the girls were tending to take more STEM classes after this conference. (Note that of those who said their attitudes had changed or that they would take more STEM classes might already have had a positive attitude towards STEM or already been taking many STEM classes.)

As in previous years, the overwhelming number of volunteers at this event was integral to its success. This year, several of our volunteers were high school girls who had previously attended an EYH conference. This demonstrates the long lasting impact of EYH conferences.

We hope to continue holding this conference, as it is obvious that there continues to be a high need for STEM related events in this region. Many thanks to all of our sponsors, supporters, donors and volunteers for making this a successful event!

