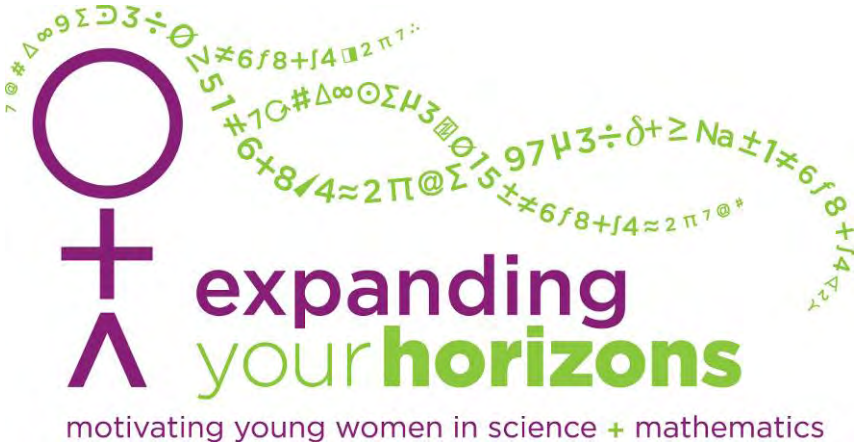

Santa Fe Fall
Expanding Your Horizons
STEM-C Conference for Young Women
5th – 8th Grade
Saturday November 8, 2014
~~9:00 AM – 3:00 PM~~
7:30 AM – 12:00 PM
Santa Fe Community College

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

Presented by:
NMNWSE and AAUW-Santa Fe

Summary Report

Prepared by
Lina S. Germann (SF Fall EYH 2014 co-chair)
December 21, 2014

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 school girls. Our ultimate goal is to motivate girls to become innovative and creative thinkers ready to meet 21st Century challenges.

Conference Schedule*:

7:30 - 8:00	On-site registration opens
8:10 - 9:10	Workshop Session 1
9:20 - 10:20	Workshop Session 2
10:20 - 10:45	Mini-STEM-C Fair
10:45 - 11:15	Welcome and Keynote Address - Jennifer Martinez
11:15 - 12:00	Complete Evaluations, Raffle, Check-out, Lunch-to-go

*The times for the conference have changed, due to the fact that PNM announced they will be shutting off the power at noon to the entire college campus.

Keynote Speaker:

Jennifer Martinez
Los Alamos National Laboratory

Jennifer ('Jen') Martinez is a staff scientist at Los Alamos National Laboratory in the Center for Integrated Nanotechnologies. She has an undergraduate degree in Chemistry from the University of Utah, a Ph.D. in Chemistry from the University of California Santa Barbara, and she is an avid skier and hiker.

Student Workshops Description and Presenters

1- Mathematician's Possibilities
Presenter: Tracy Roberts
What does it take to become a mathematician? Learn mathematical principles through games.

2- ***Physics of Toys***
Presenter: Ruth Howes
Ever wondered how your favorite toys moved? Learn the physics of toys through hands on interaction and observations.

3- ***Python Programming***
Presenter: Judy Pino
Learn how to code with python programming! Write and run your own code to create graphics.

4- ***The Smile Tower***
Presenter: Carla Busick
Work as a team to apply physics and engineering principals to create a tower. Learn how to budget and plan to create a building.

5- ***Understanding DNA***
Presenter: Paige Prescott
Learn how to extract and analyze DNA. Review different DNA strands and learn how to identify different genetic markers.

6- ***Architecture of Habitat for Humanity***
Presenter: Jacqueline Ulrich
Habitat for Humanity brings volunteers together to create thoughtfully designed homes. Learn how use an Architectural Scale by creating your own house plan!

7- ***Aviation and Aerospace***
Presenters: Marianne Francois & Elizabeth Hunke
Have you ever wondered what makes an airplane fly? Learn how airplanes fly, how pilots communicate, and how to read navigational charts through creating and testing gliders.

8- ***Communication in Networks***
Presenter: Christa Brelsford
How long does it take for a message to travel from one person to another? Learn how to pass messages over different types of networks.

9- ***Digital Fabrication: 3D Printing and Laser Cut Models***
Presenters: Alex Hamada & Bethany Walker
Learn about several different methods of digital fabrications through the use of a 3D printer. Take your design from conception to creation!

10- ***Fossils and Rocks: What Did Earth Look Like Back Then?***
Presenter: Kate Zeigler
Determine what the world used to look like thousands and millions of years ago through analyzing rocks and fossil records. Learn how to "read" fossil records and other clues left in sedimentary rock.

Adult Workshop Description and Presenters

Inquiry-Based Science: Asking Questions that Lead to Discovery

Presenters: Victoria Roanhorse & Duane Dill

What is inquiry, really? Learn how asking questions can lead to new scientific discoveries. Presented by ¡Explora!

Sponsors and Donors:

This conference would not be possible without the support of our sponsors:

Sandia National Laboratories
Los Alamos National Laboratory
Los Alamos National Security, LLC
Flow Science, Inc.
Santa Fe Community College
Santa Fe Institute
Los Alamos National Bank
New Mexico EPSCoR
Richard Hertz and Doris Meyer Foundation
Santa Fe Community Foundation
Rio Grande School
OpenEye Scientific Software, Inc.
Santa Fe Alliance for Science

This conference was brought to you by:

Santa Fe Fall EYH 2014 conference chairs:
Phyllis Baca, NMNWSE
Lina Germann, AAUW-Santa Fe

Santa Fe Fall EYH 2014 Steering Committee:
Kate Binns, Santa Fe Alliance for Science
Beatrice Montoya, OpenEye Scientific Software, Inc.
Shelley Rossbach, AAUW-Santa Fe

With a special thank you to our volunteers:*
Barbara Asarch-Aronowitz, Shirley Aune, Jeri Balick, Zee Bee, Jen Black, Krisztina Boda. Sandra Bradley, Melanie Buchleiter, Diane Catron, Joan Cavolina, Margo Clark, Shane Coffing, Sabrina Cook, Renzo Fancellu, Rochelle Follmer, Jan Frigo, Tinka Gammel, Susan Gibbs, Maya Griego, Carol Heppenstall, Irene Lee, Yazlin Maloof, Susan McIntosh, Esther Milnes, Luanne Moyer, Helen Nelson, Anna Romero, Raspberry Simpson, Sally Sower, Louise Yakey. (30)

And mini-STEM Fair participants (5 participants) from:
NM Museum of Natural History & Science
Parachute Factory in Las Vegas
Suitcase for Survival/ BioPark Outreach Program

And the Santa Fe Community College Student Ambassadors (6 participants).

A special thanks to our workshop presenters and keynote speaker (15)

Total number of volunteers: 61!

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

Many Thanks to the donors of swag for the girls:
CHRISTUS St. Vincent Regional Medical Center
¡Explora!
Los Alamos National Bank
National Alliance for Partnerships in Equity
NM Alliance for Minority Participation
New Mexico State University
New Mexico EPSCoR
UNM STEM-H Center

Outcomes

Number of participants:

Student participants (based on check in at conference): 142
Student evaluation forms received: 131 out of 142 (92%)
Students receiving scholarship to attend: 37 out of 142 (26%)
Adult participants: 9 (teachers and parents)
Participants attending Adult workshop: 14 (teachers, parents, volunteers)
Adult volunteers total: 61 (Total volunteers includes pre and post-conference volunteers)

Demographics of student participants:

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

Schools:

Table 1: Schools from which participants came
(based on pre-registration and on-site registrations – includes some no-shows)

School	# of girls		School	# of girls
Amy Biehl Community School	9		NM Connections Academy	3
Atalaya Elementary	1		Ohkay Owingeh Community School	2
ATC	4		Piñon Elementary	11
Bandelier	1		Pojoaque Intermediate School	12
Capshaw MS	4		Ramirez Thomas Elementary	1
Carlos Gilbert Elementary	1		Rio Grande	1
Chamisa	1		Salazar Elementary	2
Chaparral Elementary	4		Santa Fe Girls School	6
Desert Academy	2		Santa Fe Indian School	15
El Camino Real Academy	2		Santa Fe Prep	2
El Dorado Community School	6		Santa Fe School for the Arts & Sciences	3
Gonzales Community School	2		Santo Nino Regional Catholic School	3
Kearny Elementary	4		St. Michael's High School	2
La Mariposa Montessori School	3		Sweeney Elementary	9
Los Alamos Middle School	4		Tesuque Elementary	1
Mandela International Middle School	3		Tierra Encantada Charter School	2
Memorial Middle School	1		Turquoise Trail Charter School	2
Nava Elementary	1		Wood Gormley Elementary	7
Nina Otero Community School	7		Total	144

Grade Levels:

Table 2A: Grade level of participants (based on Table 1)

Grade	Number of participants	Percentage
5th	60	42%
6th	31	22%
7th	38	26%
8th	15	10%
Totals	144	100%

Table 2B: Grade level of participants (based on 131 surveys collected)

Grade	Number of participants	Percentage
5th	50	38%
6th	30	23%
7th	35	27%
8th	13	10%
No Response	3	2%
Totals	131	100%

Race/Ethnicity:

Table 3: Ethnicity reported by student participants (based on 131 surveys collected)

Answer Options	Response Percent	Response Count
Native American	14%	18
African American	2%	2
Hispanic	27%	35
Asian	5%	6
White	31%	40
Native Am/Hispanic/White	1%	1
African American/White	1%	1
Native American/White	2%	3
Hispanic/White	8%	10
Asian/White	2%	2
No Response	10%	13
Totals	100%	131

Socio-economic status:

Of the 142 students who attended, 37 individuals or 26% were given full scholarships of $10 to attend the EYH Santa Fe conference.

Evaluation of Conference Sessions

Keynote Speaker:

Table 4: Keynote Panel content rating.

Answer Options	Response Percent	Response Count
Dull	2%	3
Just OK	7%	9
Mostly Good	26%	34
Fantastic	50%	66
No Response	15%	19
Totals	100%	131

Workshops:

Workshop Title	Smile Tower	%	Fossils & Rocks	%	3D Printer	%	Physics of Toys	%	Architecture	%
# Responses	26		30		28		21		32	
Dull	0	0	3	10%	1	4%	0	0%	1	3%
Just OK	3	12%	2	7%	2	7%	0	0%	3	9%
Mostly Good	5	19%	8	27%	5	18%	1	5%	7	22%
Fantastic	18	69%	17	57%	19	68%	20	95%	17	53%
N/A	0	0%	0	0%	1	4%	0	0%	4	13%
Difficulty Rating										
Too Easy	1	4%	5	17%	0	0%	3	14%	2	6%
Just Right	24	92%	29	97%	19	68%	18	86%	23	72%
Too Hard	1	4%	0	0%	8	29%	0	0%	4	13%
N/A	0	0%	1	3%	1	4%	0	0%	3	9%

Workshop Title	Aircraft	%	Networks	%	Python Program	%	Understand DNA	%	Math Possibilities	%
# Responses	25		14		30		29		27	
Dull	1	4%	0	0%	1	3%	0	0%	1	4%
Just OK	3	12%	4	29%	0	0%	1	3%	2	7%
Mostly Good	6	24%	6	43%	7	23%	4	14%	15	56%
Fantastic	14	56%	4	29%	21	70%	24	83%	9	33%
N/A	1	4%	0	0%	1	3%	0	0%	0	0%
Difficulty Rating										
Too Easy	3	12%	2	14%	2	7%	3	10%	6	22%
Just Right	21	84%	10	71%	26	87%	26	90%	20	74%
Too Hard	0	0%	1	7%	0	0%	0	0%	0	0%
N/A	1	4%	1	7%	2	7%	0	0%	1	4%

Conference Evaluation:

Q8 Did this conference make you want to take more STEM classes?

Answer Options	Response Percent	Response Count
Yes	83%	109
No	5%	7
No Response	11%	15
Totals	100%	131

Q9 Did this conference change your attitude about STEM?

Answer Options	Response Percent	Response Count
Yes	69%	90
No	20%	26
No Response	11%	15
Totals	100%	131

Q10 Did this conference change your view of scientists, engineers, technologists and/or mathematicians?

Answer Options	Response Percent	Response Count
Yes	73%	96
No	15%	20
No Response	11%	15
Totals	100%	131

Responses to Open-ended questions on the Student Evaluation Form

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:

- **"It inspired me."**
- **"I loved it!!!"**
- **"Everything was Great."**
- **"It was really fun, cool, and interesting."**
- **"The classes are really fun and you learn a lot of new things."**
- **"It was really fun and easy."**
- **"I liked it but it was difficult."**
- **"Awesome."**
- **"I want to come back again."**
- **"This was fun. We should keep doing this."**
- **"I wish I could do more than two workshops."**
- **"I met a lot of people who had similar interests to me. It was fun to meet new people, make friends."**

A sample of responses to "What I expected was….." and What I got was….."

- What I expected was **"something like the last two years with the same workshops and the same thing."** What I got was **"different workshops, more people my age in the group, yummy hot chocolate, interesting speaker and lots of other stuff."**

- What I expected was **"to learn."** What I got was **"even more than what I wanted to learn (which was very good)."**

- What I expected was **"to get into a group and tour many different scientific and math subjects and get to meet new people and learn new things."** What I got was **"INSPIRATION to do more scientific experiments and math."**

- What I expected was **"to sit through a long boring lecture."** What I got was **"fun experiments and activities."**

- What I expected was **"that I would know most of the stuff that the people would teach, but I actually didn't know many of the facts and I learned a lot of new things."** What I got was **"to learn many new things."**

- What I expected was **"it to be hard and boring."** What I got was **"it was fun and intriguing."**

- What I expected was **"boring science."** What I got was **"awesome science."**

- What I expected was **"sitting and listening to someone talk about science."** What I got was **"interactive classes."**

- What I expected was **"a conference stating the rules."** What I got was **"two awesome classes."**

- What I expected was **"to just learn about a couple types of science and not really do anything with it."** What I got was **"hands on ways of looking into different careers/fields of science."**

- What I expected was **"a bunch of booths like a science fair."** What I got was **"something much more cool & interactive/classes."**

- What I expected was **"a long talk about jobs."** What I got was **"hands-on learning."**

A sample of responses to "Next, I will….."

Many girls:

- Wrote **"go home and try what I learned"**
- Wrote **"share what I learned with friends, family and/or school"**
- Wrote **"do this again in the spring" or "do this again next year"** and
- Referred to the workshops they went to, such as Python Programming and DNA, **saying they want to learn more about specific things.**

Individual responses:

- **"Reflect on what I learned today."**
- **"Tell my parents what I learned and rock out knowing I am smarter than before."**
- **"Learn more about what I want to do in life and sure think about the workshop."**
- **"I will try to become something good."**
- **"Work hard to achieve an education in chemical engineering."**
- **"Take science more seriously. It is important."**
- **"Learn how cars work."**
- **"Start researching on computers with really good specs to support a ton of codes."**
- **"Consider some of these careers."**
- **"Go tell my mom how wonderful it was."**
- **"Look into taking some more classes in science."**

Concluding Thoughts

Our Fall 2014 Santa Fe Expanding Your Horizons conference event can be viewed as very successful based on several diverse metrics. The event drew a diverse group of girls with respect to geographic, racial/ethnic and socioeconomic characteristics:

- Students represented 37 different public, charter, and private schools from all over Santa Fe and surrounding communities (Pojoaque, Los Alamos, and Albuquerque).
- With 31% of students identifying themselves as white and 10% with no response, we can safely assume that about 59% of respondents were from underrepresented groups in STEM.
- In addition, an interesting low number of 26% of participants received scholarships to attend. Having offered this conference for 6 years in a row now with $10 registration fee, it seems that fewer and fewer families over the years have been asking for this $10 scholarship. We are hesitant to raise the fee as long as we can 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. The activities were appropriate for the girls at this age level, with most of the participants rating their workshop experience as "just right" and "fantastic." We also tried our best to group the girls by grade level and have the 5th and 6th graders in separate groups than the 7th and 8th graders, so that the workshop presenters could add another level of sophistication for the older girls.

One glitch to the original planning of this conference was the late announcement by SFCC and PNM about a scheduled power outage to the whole SFCC campus on the same day as our conference. Luckily the outage was to start at 12 noon, and with only two-weeks notice, we decided to go ahead with the conference starting at an earlier time and ending right before 12 noon, giving the girls a boxed lunch "to go" and providing a shortened mini-STEM Fair. Every registered participant was contacted by phone and email about the change in time.

Even with the shortened program, the girls seem to enjoy the conference as indicated by their responses to the open-ended questions and the conference evaluation questions, using adjectives like: **Inspiring, awesome, fun, wonderful,** and **intriguing**.

Based on the participant responses, the event changed perceptions of STEM (69%) and STEM practitioners (73%) in a positive way, and 83% of the girls were tending to take more STEM classes after this conference. (Note that of those who said that their attitudes towards STEM did not change might already have had a positive attitude towards STEM to begin with).

As in previous years, the overwhelming number of volunteers at this event was integral to its success. In addition, the Adult Workshop got excellent reviews.

We hope to continue holding this conference, as it is obvious that this type of conference is still very much needed. **Many thanks to all our supporters, donors, and volunteers for making this event successful.**