

# Summer Physics Camp for Young Women

## Pojoaque Valley high School

Summer Physics Camp for Young Women-2017

## June 5-16, 2017



Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

# Organizers and Sponsors



**Anna Llobet – P-23**  
**Sarah Hernandez – MST-16**  
**Alan Hurd - NSEC**  
**Scott Robbins - NSEC**



**Makenna Reeves**

## Sponsors



# Schedule

## 1st Summer Physics Camp for Young Women

		Monday 6/5/17	Tuesday 6/6/17	Wednesday 6/7/17	Thursday 6/8/17	Friday 6/9/17	Monday 6/12/17	Tuesday 6/13/17	Wednesday 6/14/17	Thursday 6/15/17	Friday 6/16/17	
08:00 AM	08:30 AM	Students Report and Identify at Main Office at PVHS										
08:30 AM	09:00 AM		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	
09:00 AM	09:30 AM	Welcome. Logistics. Expectations.	Inquire Activity	Inquire Activity	Inquire Activity	Departure to Los Alamos	Inquire Activity	Inquire Activity	Inquire Activity: Tess Light	Inquire Activity	<a href="#">Elisabeth Baseman: Quantum Computing</a>	
09:30 AM	10:00 AM	Student Introductions. What do you expect	<b>How does Matter interact?</b>	<b>Light</b>	<b>Light</b>	New Mexico Consortium Biolaboratory	<b>Magnetism</b>	<b>SPACE</b>	<b>Engineering of a Rocket</b>	Maria Christina Campbell: High explosives	<a href="#">Alan Hard: How to write your resume. How to interview</a>	
10:00 AM	10:30 AM	Questionnaire I										
10:30 AM	10:45 AM	Break	Break	Break	Break	Arrival at Los Alamos National		Break	Break	Break	Break	
10:45 AM	11:15 AM	<b>What's Matter? Atoms, phases, density, volume, mass</b>	<b>How does Matter interact?</b>	<b>Light</b>	<b>Light</b>	Welcome by Physics Division Leader <b>David Meyerhofer</b> Lunch with Associate Director for Experimental Sciences <b>Mary Hockaday</b> Visits: <b>Los Alamos Neutron Science Center National High Magnetic Fields Laboratory</b>	<b>Magnetism</b>	<b>SPACE</b>	<b>Engineering of a Rocket</b>	<b>Enrngineering of a Rocket</b>	<b>Enrngineering of a Rocket</b>	
11:15 AM	11:45 AM											
11:45 AM	12:15 PM	Lunch Speaker: <b>Vivien Zapf</b> Matter and Materials	Lunch Speaker: <b>Prietha Ferrari Silveira Ross</b> What are superconductors and why do they levitate?	Lunch Speaker: <b>Adriana Reyes Newell</b> Light. Holography. How a laser works.	Lunch Speaker: <b>Elizabeth C Merritt</b> Blowing things up! Plasma Physics		Michelle Espy: Non-destructive testing	Lunch Speaker: <b>Raymon Newell</b> Mars Rover and Science in Space	Lunch Speaker: <b>Tess Light</b> Applications in space	Lunch Speaker: <b>Nicole Lloyd-Ronning</b> Explosive deaths of massive stars and how they create black holes	Lunch Speaker: <b>Andrea Albert</b> What else is out there in space?	
12:15 PM	12:45 PM	<b>Instruction II</b>	<b>Sarah Hernandez: Being a women in Science</b>	<b>Roberta Deal: "Non-traditional career paths are still a road to success"</b>	<b>Stacy Coop: The science of tiny things: physics at the nanoscale</b>		<b>Instruction II</b>	<b>Instruction II</b>	<b>Instruction II</b>	<b>Instruction II</b>	<b>Demo: Lloyd-Ronning electromagnetic spectrum -</b>	<b>Emily Robinson: LANL student Programs</b>
12:45 PM	01:15 PM		<b>Instruction II</b>	<b>Instruction II</b>	<b>Instruction II</b>						<b>Instruction II</b>	<b>Instruction II</b>
01:15 PM	01:45 PM	Break	Break	Break	Break		Break	Break	Break	Break	Break	Break
02:15 PM	02:45 PM	<b>Demo</b>	<b>Lab</b>	Demo: Cude-Woods Muon Tracker	<b>Katie Mussack</b> Fun explosions demo/experiment		Demo: Magnetism (Mandie Gehring)	<b>Lab</b>	Elise Koskelo: NSTEC Engineering	<b>Lab</b>	<b>Scott Robbins: Intro to visualizing data, how to give a presentation</b>	<b>Certificate event</b>
02:45 PM	03:15 PM			<b>Lab</b>			<b>Lab</b>					
03:15 PM	03:30 PM	Wrap up	Wrap up	Wrap up	Wrap up		Wrap up	Wrap up	Wrap up	Wrap up	Wrap up	Wrap up

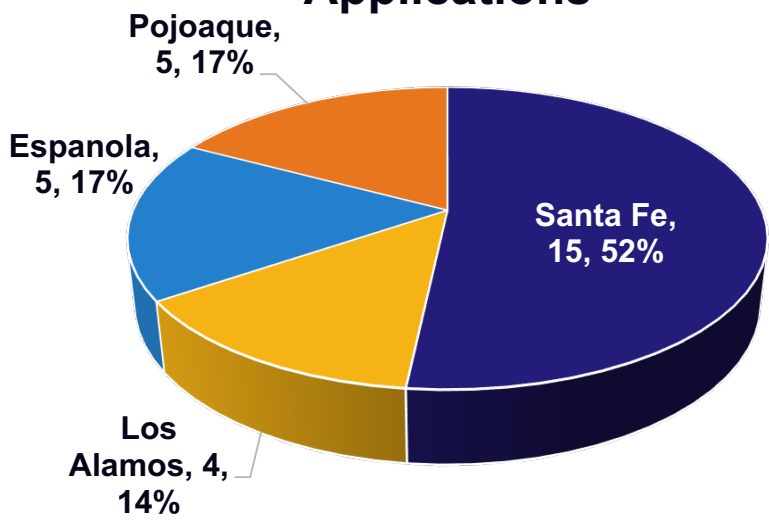
# Goals

- a) **Inspire Wonder** The inquiry-based labs encourage students to ask questions and discover answers to fundamental concepts such as current, voltage, resistance, velocity, acceleration and trajectories. Teach demos of physics concepts and make physics come alive in a practical and exciting way. The demos will cover magnetism, electricity, engineering design challenge, waves, pressure, motion, optics, electromagnetic spectrum, cosmic rays etc.
- b) **Empower Young Women** : 2-week physics-camp experience for 20 young women the summer prior to taking their first physics class in high school. Throughout their lifetime, girls receive countless subtle messages that science is for boys. Even the types of toys they play with growing up provide boys with hands on experience of physics concepts that girls often lack. The lack of female role models in physics, engineering and technology reinforce the message that physics is for boys. By giving young women extra time to do hands on lab activities with female mentors, ask questions in a supportive environment and understand the exciting ways that physics impacts their everyday life, the camp develops girls' self-efficacy in physics and empowers them to persist in learning even when they have to struggle.
- c) **Adapt program to New Mexico needs**: Stipends were also provided for the students who completed the two-week camp, since the majority of these students rely on income from minimum-wage jobs during the summer. Thus, the stipend was to supplement the loss of income and travel cost during these two-weeks.
- d) **Sustainability**: The LANL program will implement measures to ensure sustainability through 2017 and beyond including: a) Fundraising plan development including LANL-DOE, local, state and federal sources; b) Phase Pilot implementation and Evaluation to determine the program impact. A pre/post test strategy was used to measure the extent to which learning may have occurred over the course of the 2-week program;

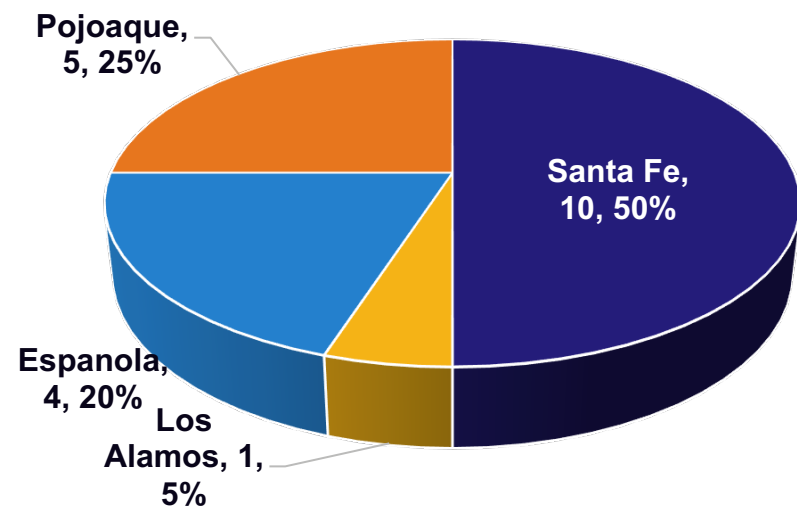
# Statistics

- 29 applications

### Applications



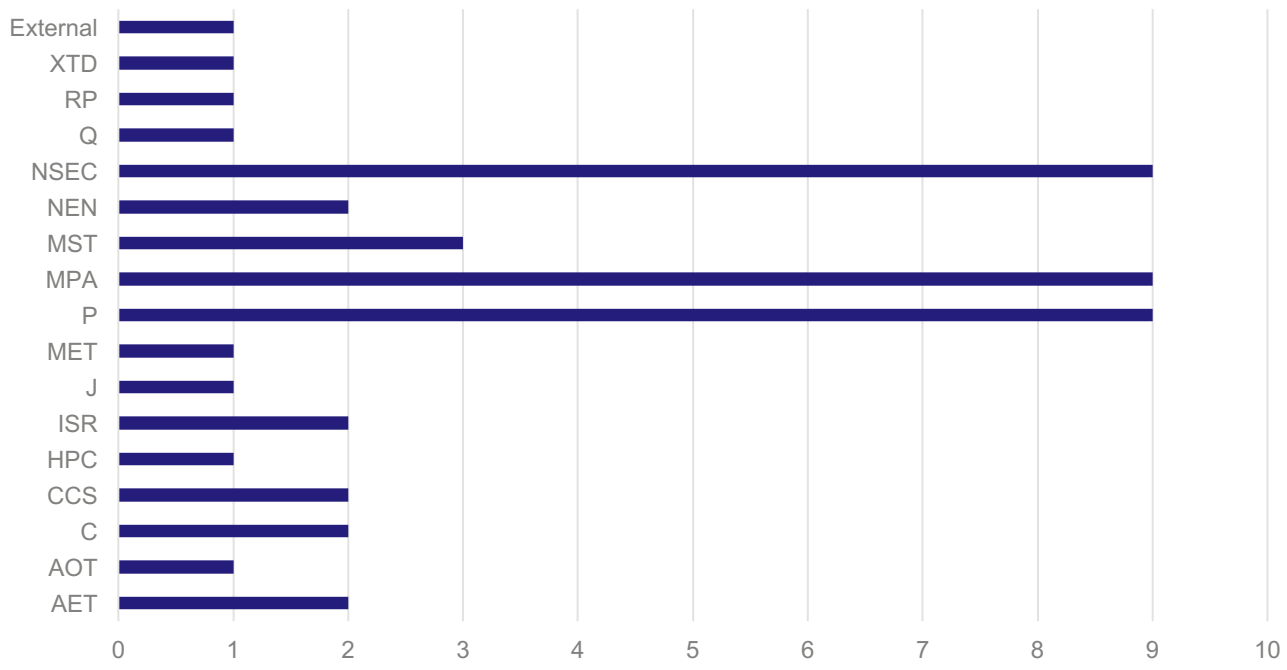
### Accepted



# Volunteers

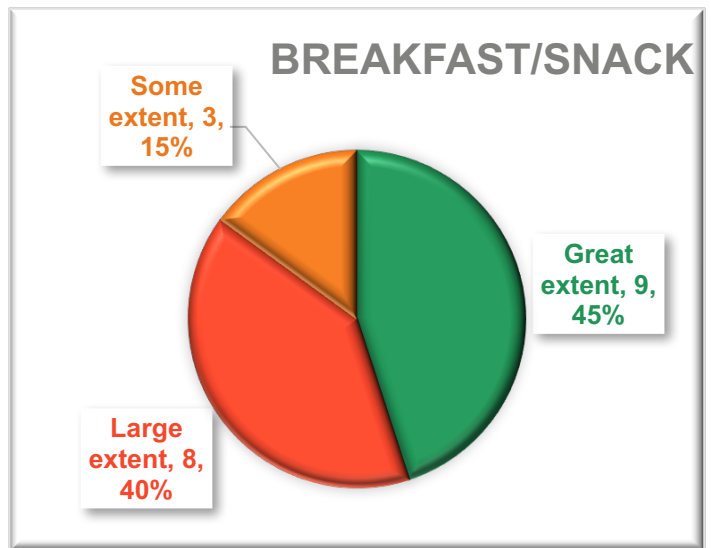
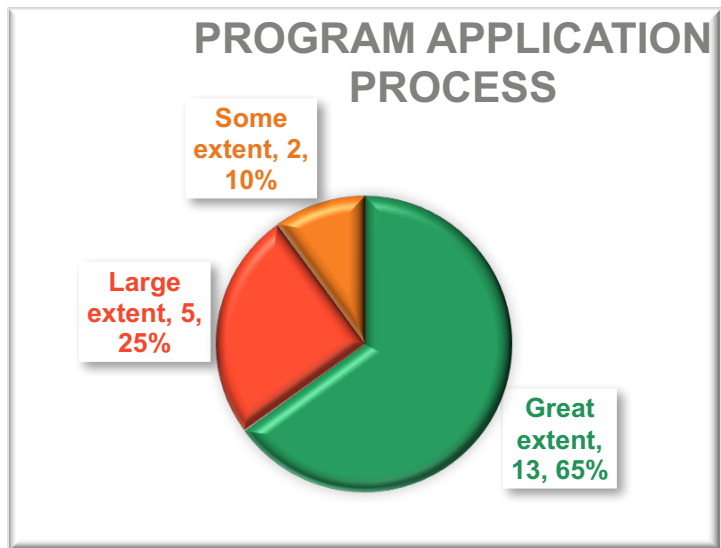
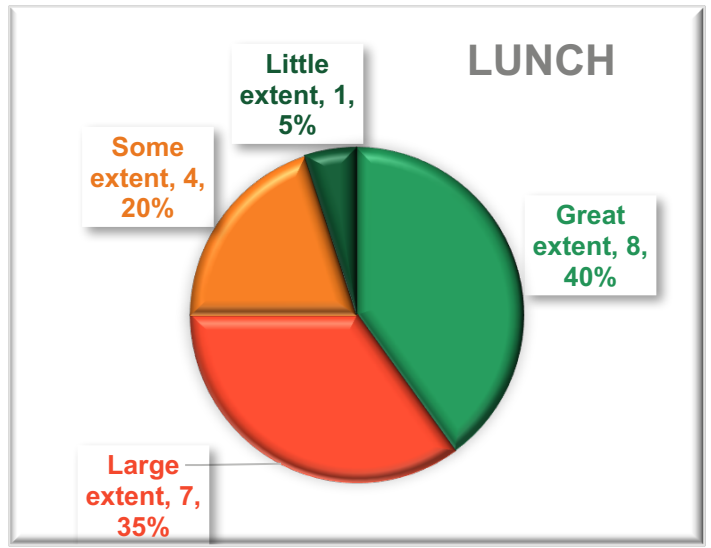
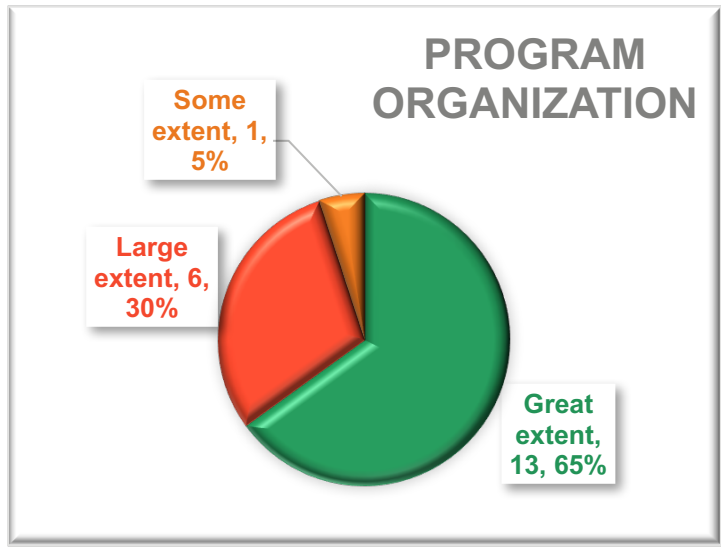
- 48 LANL volunteers (21 from ADEPS)
- 25 Contributing LANL organizations

Volunteers' Organizations



Sandra Zimmerman	AET-1
Michelle Espy	AET-6
Haley Brooke Turman	AOT-MDE
Carrie Walker	C-NR
Elizabeth Anne Hjelvik	C-PCS
Elizabeth Simons	CCS-2
Nicole Marie Lloyd-Ronning	CCS-2
Elisabeth Baseman	HPC-DES
Sarah Nicole Lamm,	ISR-2
Tess Light	ISR-2
Maria Christina Campbell	J-8
Meagan Wheeler	MET-1
Stacy Copp	MPA-CINT
Priscila Ferrari Silveira Rosa	MPA-CMMS
Serena Eley	MPA-CMMS
Chuck Mielke	MPA-MAG
Franziska Weickert	MPA-MAG
Ian Charles Grey	MPA-MAG
Shalinee Chikara	MPA-MAG
Vivien Zapf	MPA-MAG
Xiaxin Ding	MPA-MAG
Sarah Hernandez	MST-16
Roberta Beal	MST-8
Dianne Wilburn	MST-DO
Charlotte Berg	NEN-3
Margaret Kellett Sudderth	NEN-3
Alan Hurd	NSEC
Cassandra Lee Casperson	NSEC
Elise Koskelo	NSEC
Emily R. M Robinson	NSEC
Emily Robinson	NSEC
Georgia Sanchez	NSEC
Josefina Salazar	NSEC
Scott Robbins	NSEC
Jasmine Vigil	NSEC
Raymon Newell	P-21
Andrea Albert	P-23
Anna Llobet	P-23
Mandie Gehring	P-23
Matthew Murray	P-23
Elizabeth Catherine Merritt,	P-24
Christopher Burton Cude-Woods	P-25
Hannah Leigh Weaver	P-25
Hubert Van Hecke	P-25
Lia Catherine Meirose	Q-14
Maria Grazia Camella Nappi	RP-DO
Katie Mussack	XTD-IDA
Adriana Reyes-Newell	

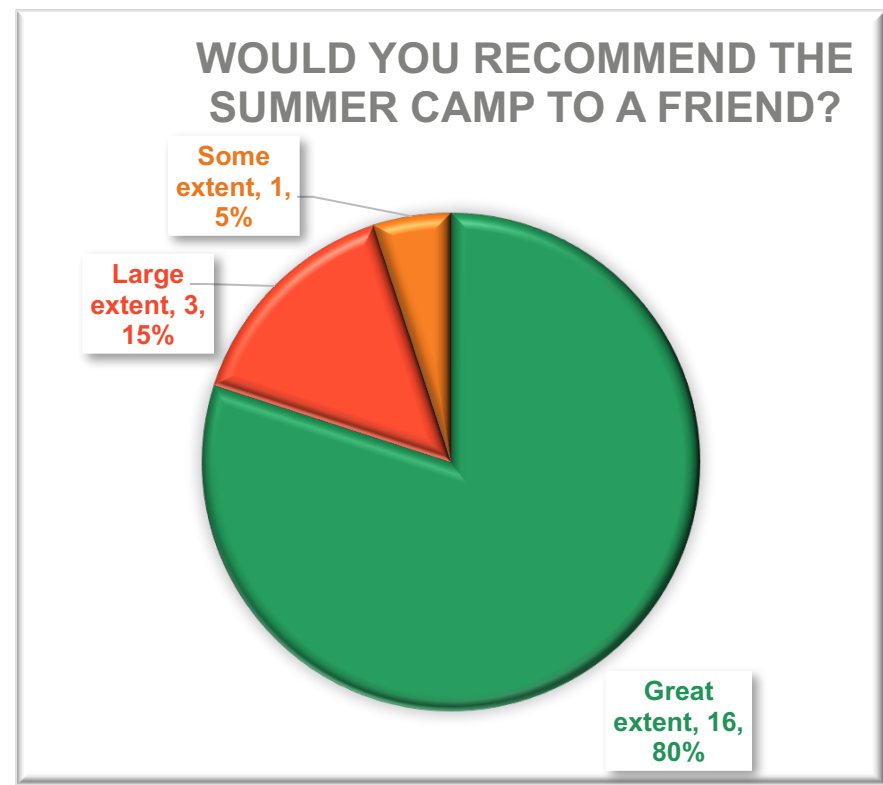
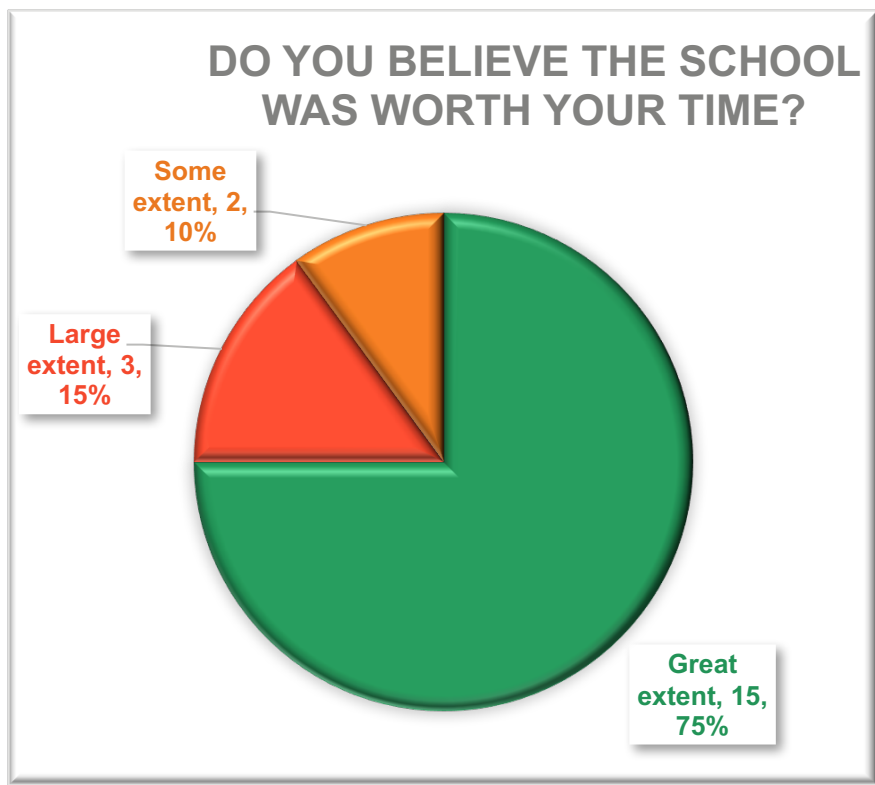
# Post Summer Camp Survey



# Post Summer Camp Survey:

**90%** The Camp was worth their time to Large or Great extent

**95%** would recommend the Camp to a friend to Large or Great extent



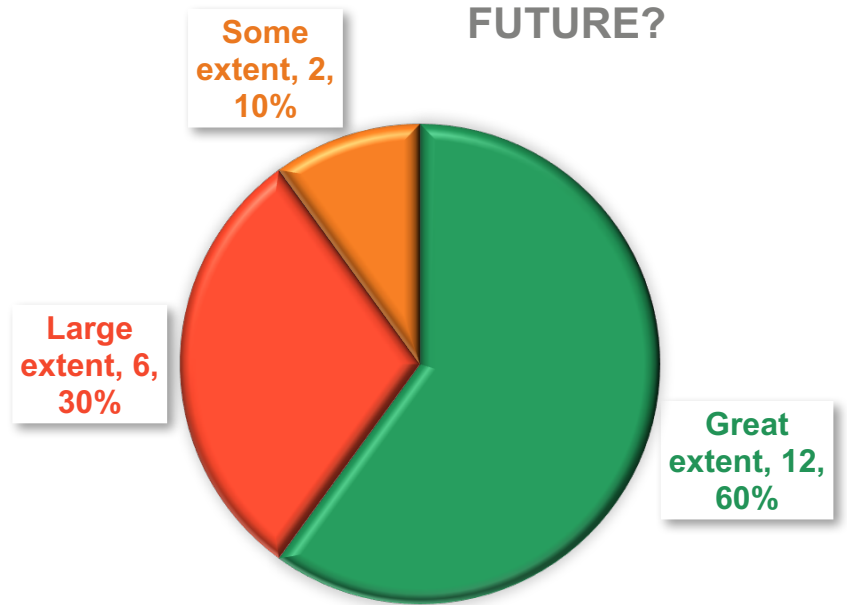


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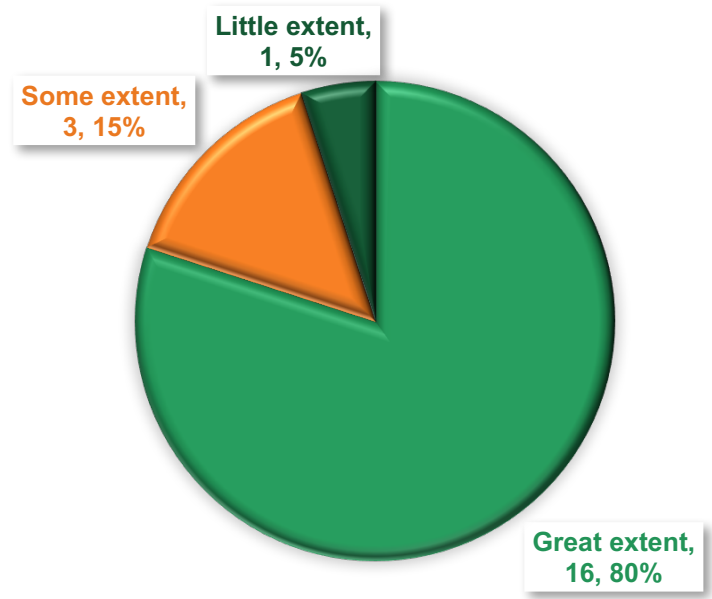
90% The Camp was of value to their future to Large or Great extent

95% Might consider applying for a LANL internship to Large or Great extent

DO YOU BELIEVE THE SUMMER CAMP WAS OF VALUE TO YOUR FUTURE?



YOU MIGHT CONSIDER APPLYING IN THE FUTURE FOR A LANL INTERNSHIP?

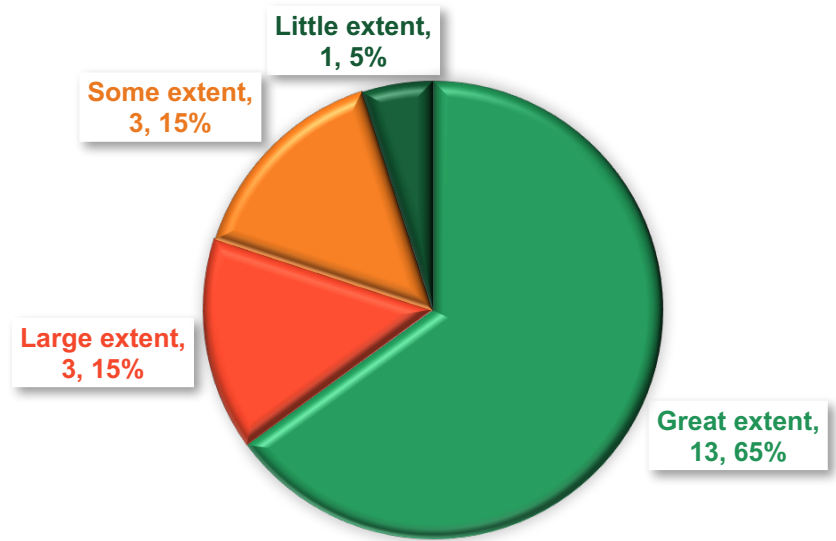


# Post Summer Camp Survey:

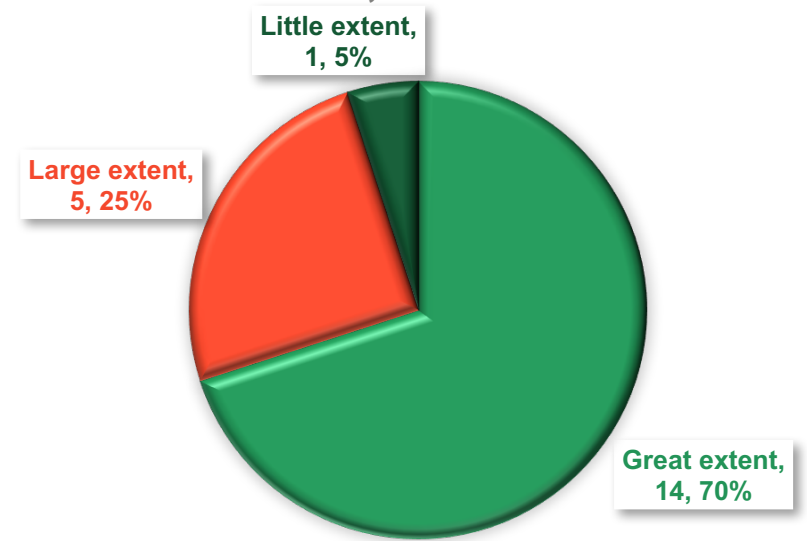
**80%** The Camp provided the desired information to Large or Great extent

**95%** Had valuable interactions with Teachers, Volunteers and mentors to Large or Great extent

**DID YOU GET THE INFORMATION THAT YOU DESIRED FROM THE SUMMER CAMP**



**DID YOU HAVE VALUABLE INTERACTIONS WITH TEACHER, MENTORS, VOLUNTEERS**



# Quotes from students

*“The teachers/volunteers were very nice and encouraging to us. We were never left with nothing to do. We were always doing something challenging yet fun”*

*“A wide range of topics from speakers made it very interesting. The topics made me ask more questions about science and the intricacies that are required in research”*

*“The demos made things that are complicated and hard to understand into things that made me curious about physics”*

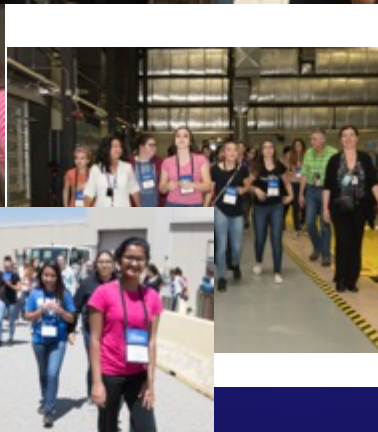
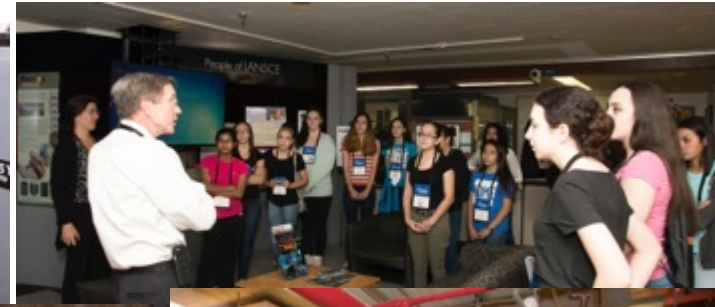
*“The physics camp increased my confidence about going into Physics as a female”*

*“I hope to do this program again!”*

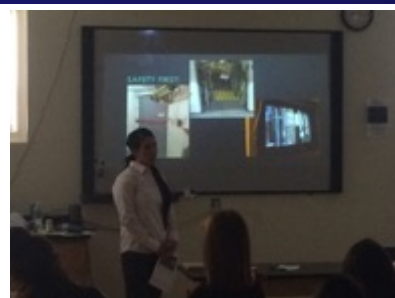
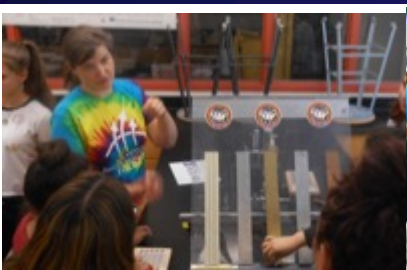
*“I really enjoyed having talks about resources and the student internships, because they allowed gaining understanding of how to appeal to people on paper and how the LANL internship works”*

*“Overall this was a great camp that taught me even more about physics”*

# Tour of LANSCE and NHMFL



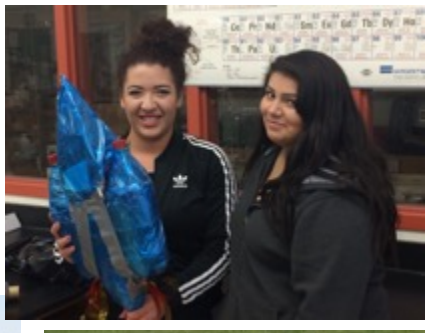




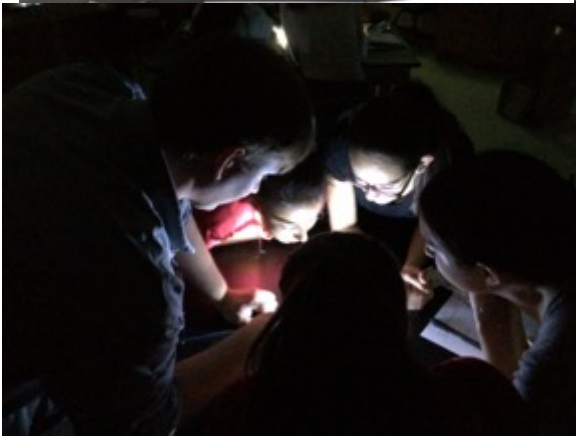
# Rocket challenge















## Feedback: What can we do better

- **More hands on and more breaks**
- **Shorter talks by speakers**
- **Tour of Lab was great**
- **Plan ice-breakers for students to get to know each other**
- **Don't have lunch speaker during lunch**
- **More options for breakfast**
- **Involve more than physics**
- **More difficult topics taught or explained**
- **More opportunities to work with other girls**
- **Plan more changes of room (eg lunch in a different place, lunch speaker in different room)**
- **Have more opportunities for girls to ask questions in private settings**
- **Lunch in a different room**
- **Team building exercise at the beginning of Summer camp**
- **More hands-on engineering activities**
- **It was nice to have the talks on internships and resources**
- **Spend only one day in each topic**