



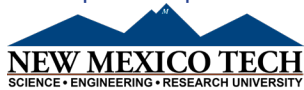
# The Rocket Report

## Longtime Mentor Wins STEM Award

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In partnership with:



Collaborator:



#### Remember, Teachers:

It's never too early to make bussing arrangements for our classes and events!



When Dr. Imelda Atencio was growing up in Dixon, NM, there was apparently so little light pollution, she was able to look up into the night sky and dream of becoming an astronomer.

Her dream came true when she worked at AFRL's Starfire Optical Range (SOR) telescope. Now she leads the Directed Energy Directorate's Laser Division on Kirtland AFB, responsible for over 200 scientists, engineers and staff!

She's been one of our mentors for a long time...over 20 years! In January 2004, for example, she led a tour of the SOR for our STARBASE students. She's helped us with many



other STEM events over the years, too, such as STEM Demo events, Super STEM Saturday events, and serving as a Colony Commander at Mission to Mars Link-Up Days.

Now the Department of the Air Force has given her the well-deserved *2021 Outstanding STEM Outreach Champion Award!* Read more about it here: <https://www.afrl.af.mil/News/Article/2989310/dreams-come-true-for-air-force-stem-champion/>.



### Tours and Demos

On 11 March 2022, we supported the regional Junior Science & Humanities Symposium competition hosted by UNM STEM-H, by providing an AFRL Tour for 11 high school students and 10 chaperones/event organizers.

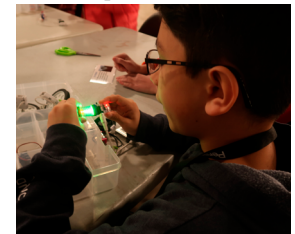
On Tuesday, 22 March 2022, we went to the KAFB Youth Center and helped students on Spring Break make human Energy



Sphere/Energy Stick circuits, plus paper Lightsaber circuits.

On Friday, 25 March 2022, we went to the Central NM Research Challenge event at the Expo New Mexico fairgrounds. There, fourth and fifth grade students rotated

through several of our STEM stations, performing activities including making paper satellites, making paper circuit lightsabers, and making electronic gadgets using littleBits components.



### Symposium Held

Well, we did it! The STEM Challenge Symposium egg-stravaganza was held 5 April 2022, and it was egg-cellent!

30 high school teams--9 from Albuquerque Institute for Mathematics and Science (AIMS), 12 from La Academia de Esperanza (LADE), and 9 from Sandia Preparatory School (Sandia



Prep), qualified for the culminating STEM Symposium.

*Continued on page 3*

### Qualifying Launch Days

Neither rain, nor snow, nor pandemic precautions could prevent our spectacular Albuquerque School of Excellence (ASE) and Albuquerque Institute for Mathematics and Science (AIMS) STARBASE 2.0 teams from attempting some qualifying launches on 31 March and

*Continued on page 2*





# Mission to Mars

For Fifth Graders

Mars Vast Interferometer Variable Array (VIVA) Mission 2021-2022

## Mars Invitational

Going to the Link-Up Day event on 19 April 2022? Information and directions will be included with your *invitation packets*.

The blue postcard is like a ticket for parents and visitors! Let us know if you don't receive yours.

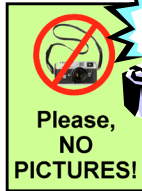


## Media Coverage/Pictures

Attending this year in person? Note: There may be lots of paparazzi and media at the Mission to Mars Link-Up Day event.

On Link-Up Day, Mars teachers should turn their Media Release Forms in at the Media Release Table before proceeding to the Docking Station (Registration).

"Please, No Pictures!" badges will be worn by those who do not turn in a form, or indicate "consent de-



**Notice:** Video coverage and photos will be taken during the Link-Up Day event. Some parents and students may object to having their picture taken.

nied." Respect the badge, please, photographers.

## Not On the Menu



In-N-Out Burger has an underground "secret" menu, but delivery to Mars is not on the menu, and that's no secret. Teachers and students must eat the nutritious lunch

they prepared in advance.

## Just No

Students--No running, jumping over or going behind tunnels after construction is complete, or unplugging fan power cords as pranks. Teachers--Remind students in advance—loyal astronauts should be on a serious mission to colonize the Red Planet.

## Link-Up Day Date/Site

| Date          | Site                   | Habitats |
|---------------|------------------------|----------|
| 19 April 2022 | Albuquerque Conv. Ctr. | 31       |

## Sounds Good to Me

Once upon a time, *long* before iTunes or CD's were a thing... music used to be stored on these big, round, black, vinyl frisbee-looking things called *records*.



In order to play them, you had to put them on this really bulky, ancient device that us cavemen used to call a *record player*.

Now, this clunky thing was *way* too big to put in your pocket like a smartphone, and it didn't even have internet(!), *but* it had one *really cool* feature iTunes and CD's *don't*: A *speed dial*.

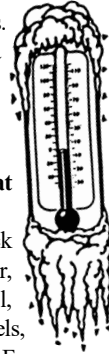
See, there was this little switch that let you select how *fast* the record would spin: 16, 33 1/3, 45, or 78 *revolutions per minute*. Most were recorded at 33 1/3, but put a 33 1/3 record on the 78 setting, and you could make Nat King Cole sound like *Alvin and the Chipmunks!* It was *awesome*.

Mars has a similar feature. Sound on Mars travels about 240 meters per second (vs. about 340 on Earth). But since Mars' atmosphere is thin carbon dioxide, high-pitched sounds travel about 10 meters per second *faster* than lower ones. So, next time you go to Mars, take some Nat King Cole records with you. *Aaaaaaaaalvin!* Sorry, Dave.

## Packing Heat

It can get chilly on Mars. Besides some heat, here's a quick list of things to pack, so you're not left out in the cold on Link-Up Day:

- **Pre-Cut Plastic Habitat Pieces**  
Front Wall, Airlock (Door Panel), Floor, Left Wall, Right Wall, Two Connecting Tunnels, Ceiling, Back Wall, Fan Tunnel



• **Life Support System Model**  
You'll need this to do your Technical Briefing—and to survive on Mars! Temperature being one of eight possible systems, by the way.

• **Link-Up Day Lunch**  
Without Lunch on Mars, the look students might give you may be rather icy.

### Other Items

For a complete list, see the **Manifest List** in the Link-Up Day Guide.



Your **commitment** to this mission is crucial to its success



# DoD STARBASE NM

For Fifth Graders

By the Tuesday of the week before the first class in the series, session, or semester, we will ask you for the name, driver's license number/state of issue, date of birth, and the FULL Social Security Number, of every adult coming through the base gate for that series of classes.

## And Less Expensively, Too!

DoD STARBASE NM Day 3 is kind of like the old *Six Million Dollar Man* show:

*Gentlemen, we can rebuild him. We have the technology. We can make him better. Stronger. Faster.*

Using little *littleBits* components like *Output Bits*, which complete some action or task, and *Wire Bits*, which expand a circuit's reach and change its direction, students build little devices that can do things like light up and sound an alarm, or blow air...better. Stronger. Faster.



## Qualifying Launch Days

*Continued from page 1*

1 April 2022. And boy, did they do *terribly*. APRIL FOOLS! They all did *fantastic!* We are very proud of them!

Trying to qualify for The American Rocketry Challenge national competition is hard enough as it...your rocket can only go *so* high, stay in the air only *so* long, and your dual-egg payload can't crack...

...but this year, the window of scores needed to qualify was *very* narrow and competitive. Nonetheless, we had some scores that came pretty darn close!





# TECH Mission For Middle Schoolers

Technology and Engineering Challenges—Rocketry and Satellites Missions

By the Tuesday of the week before the first class in the series, session, or semester, we will ask you for the name, driver's license number/ state of issue, date of birth, and the FULL Social Security Number, of every adult coming through the base gate for that series of classes.

## Get Into the STEM Spirit, Scoob

Zoinks! Ha, ha, ha...Hey, Scoob, check it out! TECH Mission Day 2 students are studying *ghosts!* Who do they think they are, *Mystery Incorporated?!* That's a job for Scooby and the Gang, right, Scoob?! *Scooby Dooby Doo!!*

Wait...what's that, Fred? They're *not??* They're performing *what??* Zoinks! They're not studying ghosts...

They're performing *Spectral Analysis.*

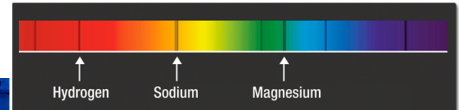
What's *that??* OK, Velma, maybe you'd better explain this one!

Well, you see, Shaggy, a *spectrum*

is a chart or graph that shows light being emitted or absorbed over a range of energies.

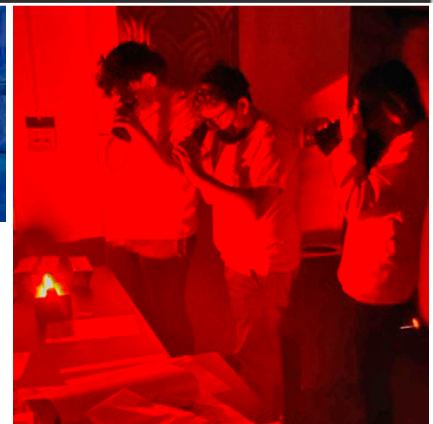
Different elements have different *spectral signatures.* Performing a *spectral analysis* helps scientists understand how objects such as black holes, neutron stars, or even galaxies produce light, and what elements they're made of.

Students in TECH Mission Day 2 are exploring light frequencies and spectral analysis with multicolored



flame tests, spectrometers, and even multi-colored M&Ms.

Zoinks! Thanks, Velma! *Raah, rants, Relma!* Rat, I mean *that*, sounds more fun than a whole barrel of *Scooby Snacks!* Right, Scoob?!



*Scooby Dooby Doooooooooo!!*



## Robotics Challenge For Middle Schoolers

### Expo Readiness

Friends, Romans, countrymen, lend me your circuit boards. Students, teachers, robots: Are you ready for the Expo?

The Robotics Challenge Expo is fast approaching: 6 May 2022. Students are busy getting their Parallax robots ready in Module 4: Expo Readiness.

Teams design a team logo for themselves, submit photos of their decorated robots for the Robotics Pageant, prepare to dance their robots'

circuits off, and prepare themselves for a P2K2-X quiz bowl.

Of course, their robots will have courses to course through at the Expo, too. Like the great Snoopy once said: *Course you, Red Baron!* (Or something like that.)

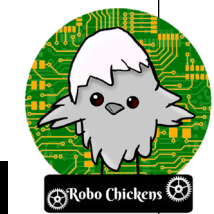
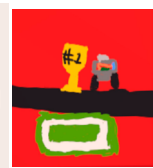
The top 30 teams who have qualified for participation in the 2022 Robotics Challenge Expo are:

BishopsAreBetterThanKnights, RoboChickens, Blue Penguins, Blue Angels, Sus Robo 3000,



Python, Dragons, RoboEagles 1 through 4, Dozem, Gryphons, The Villains, The Chipettes, Robonauts, The Fours, Fruit Snacks, Goal Diggers, Team Choo Choo, Team Toast, The Scrambled Eggs, The Brunettes, Robotoneers, JC Donuts Athletes, The Black Panthers, Bunking Broncs, The Favorites, unibrow, and RCs.

Logos are already coming in, and they look great! Here's a smattering of them so far.



## STEM Challenge For High Schoolers

### Symposium Held

*Continued from page 1*

Led by coaches Philip Watje (AIMS), Sjouke Blauw and Thomas Lloyd (LADE), and Rachel Giunta (Sandia Prep), student teams rotated between Presenting a briefing on their assignment, showing off the Performance capabilities of their egg-launching catapult devices, and demonstrating their STEM Challenge knowledge in a Quiz Bowl.

With help from volunteer judg-



es Mr. José Castillo, Mr. Steven Fiedler, Mr. Benjamin Fogg, Ms. Julie Jolly, MSgt Nicholas Sealy, and Capt Kevin Tourville, scores were tabulated and three winners determined.

Sandia Prep's Team 1, The 3 Amigos, won the Performance Excel-

lence trophy. AIMS Team 18, The Cleopatra, won the Presentation Excellence category. Last but not least, Sandia Prep's Team 8, Cavapult, won the overall Project Excellence (including combined Presentation, Performance, and Quiz Bowl scores) trophy!

Of course, EVERYONE attending the Symposium won at the two most *important* categories: STEM and eating pizza!



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Mr. Steve Burke, Technical Writer.

### Important Terms and Acronyms

**AF:** Air Force

**AFB:** Air Force Base

**AFRL:** Air Force Research Laboratory

**AFRL NM:** AFRL New Mexico (AFRL/RD and AFRL/RV), on KAFB

**AFRL/RD:** The Directed Energy Directorate of the AFRL

**AFRL/RV:** The Space Vehicles Directorate of the AFRL

**DoD:** Department of Defense

**KAFB:** Kirtland Air Force Base, Albuquerque, NM

**MM:** Mission to Mars

**S&Es:** Scientists and Engineers

**STEM:** Science, Technology, Engineering, and Math

**TECH:** Technology and Engineering Challenges

**USAF:** United States Air Force

**USSF:** United States Space Force

**VIVA:** Mars Vast Interferometer Variable Array Mission 2021-2022

#### Remember, Teachers:

Get those EPA Modification forms in!



## STEM Bytes

# STEM Signing Day Registration Open



Registration is now open for the 2022 New Mexico STEM Signing Day!

New Mexico's graduating high school seniors who plan to pursue degrees in STEM-related fields are encouraged to apply for the 2022 New Mexico STEM Signing Day.

This year's event, hosted by the AFRL New Mexico Tech Engagement Office, will take place on Wednesday, May 4 at 6pm.

Hey! That's "May the Fourth Be With You" Day! Use the Force, Luke!

During the virtual event, participating seniors will sign letters of intent to their school of choice and field of study. Participants will also be entered into a drawing to win \$1,000 scholarships.

"STEM Careers are some of the most important and in demand

here in New Mexico and around the country," said Matt Fetrow, Director of the AFRL New Mexico Tech Engagement Office.

"STEM Signing Day is a way to celebrate those students who plan to pursue these careers and honor the hard work they've already put into their educations."

Qualifying students have until **Friday, 29 April 2022** to register to participate at [www.afrlnew-mexico.com/stem-signing-day](http://www.afrlnew-mexico.com/stem-signing-day).

Fashioned after athletic signing days, the AFRL NM Tech Engagement Office created the New Mexico STEM Signing Day in 2019 as a way to celebrate high school seniors who are making a commitment to pursue higher education in science, technology, engineering or math related fields. Since then, hundreds of New Mexico students have been recognized.

### About the AFRL Tech Engagement Office



The AFRL Tech Engagement Office handles tech transfer/commercialization and STEM education outreach programs for AFRL New Mexico.

These programs are administered through agreements with various partners, including NM Tech University, the University of New Mexico, Explora and the New Mexico Trade Alliance.

### Optics 4 Kids



Besides us, one STEM education outreach organization Dr. Imelda Atencio has been involved with (see page 1) is called Optics 4 Kids. Their website, [www.optics4kids.org](http://www.optics4kids.org), details a number of hands-on STEM optics activities for various age ranges, such as building your own spectrometer or telescope.

## Advancing Young Women in STEM Scholarships



The New Mexico Out-Of-School Time Network (NMOST) has created the Advancing Young Women in STEM Scholarships to help address the gender gap in STEM disciplines and STEM-related fields.

This year, NMOST will be awarding \$5000, \$750, and \$1000 scholarships to assist and encourage young

women in pursuing a STEM career. Applications are open through 30 May, 2022.

To apply, see [www.nmost.org/nmost-aywistem-scholarships](http://www.nmost.org/nmost-aywistem-scholarships).

## Parker Probe Pioneer Passes

The concept of *heliophysics* orbits around the physics of the Sun and its impact on the solar system.



In the 1950s, heliophysicist pioneer Dr. Eugene Parker, who recently passed at age 94,

developed a theory that predicted *solar winds*. In December 2021, NASA's Parker Solar Probe, launched in 2018, became the first spacecraft to enter the Sun's upper atmosphere, and Dr. Parker lived long enough to see it! They say his face lit up like the Sun. Often, actually.

## Coming Next Issue...

- Mars VIVA Mission Accomplished
- STARBASE Days 4-5
- TECH D3--Soldering
- Robotics EXPO!

Watch for it!

