



AFRL LA LUZ ACADEMY

“CREATING THE POSSIBILITIES”



INSPIRING FUTURE SCIENTISTS AND ENGINEERS

STAR DATE: MARCH 2011
VOLUME VIII, ISSUE 7

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AFRL La Luz Academy Helps Celebrate Challenger Legacy

On 28 January 1986, at 9:39 am Mountain time, the Space Shuttle *Challenger*, STS 51-L, with a crew of seven, including Commander Francis "Dick" Scobee and the "first teacher in space," Payload Specialist Sharon Christa McAuliffe, exploded 73 seconds after liftoff.

Exactly twenty-five years later, on Friday, 28 January 2011, a memorial service was held at the Challenger Learning Center of New Mexico (CLCNM), including an honorary military helicopter fly-over and an observed moment of silence at 9:39 am.

AFRL La Luz Academy staff attended the event, which included guest speakers Colonel (and former shuttle astronaut) Mike Mul-lane, 377th ABW Commander Colonel Robert L. Maness, and Los Ranchos de Albuquerque Mayor Larry Abraham.

The tribute continued the following day at CLCNM with *Celebrating the Legacy: A Family Science EdVenture*.

This event celebrated the educational legacy of STS 51-L that lives on today through organizations such as the Challenger Center for Space Science Education (CCSSE) and their Challenger Learning Centers, and activities such as AFRL La Luz Academy's Mars Missions Flight.

Students and guests at the event participated in interactive educational activities such as indoor stargazing, a rocketry workshop,



tours of a sample Mars Missions Flight habitat, and Challenger mini-missions.

Students, guests, and dignitaries including Dr. June Scobee Rodgers, widow of STS 51-L Commander Scobee and founding

chairman of the CCSSE, visited AFRL La Luz Academy's booth at the event, exploring hands-on activities relating to Space Weather, and receiving alien flashlights, newsletters, and other AFRL La Luz Academy giveaways.

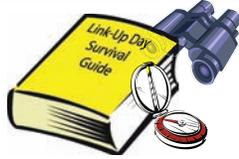




Mars Missions Flight

Mars Cave Skylight Investigation (CSI) Mission 2010-11

Link-Up Day: A Flight Director's Survival Guide



On Link-Up Day, each habitat is led by a Flight Director (classroom teacher), who keeps the three TEAMS in the habitat CREW on task and on schedule.

TEAM 'A' students are in the habitat for which *their* teacher is the Flight Director, while TEAM

'B' and 'C' students are in a *different* habitat, with a teacher from *another* school as their Flight Director. Either way, Link-Up Day students are expected to follow their Flight Director's instructions, and treat them with courtesy and respect.

The Flight Director Log is a step-by-step checklist of the entire Link-Up Day event. Refer to it often.

The same goes for the TEAMS, who should be using their TEAM Mission Log on Link-Up Day as a step-by-step checklist of the entire event from the TEAM's point of view. Check their TEAM Mission Logs every so often to verify they haven't skipped anything, and see what step they should be on next.

A blank Flight Director Log is in your manual; copies will be given out at Link-Up Day.

Also, remember: each habitat is part of a *colony*. Your Colony Commander can provide you with support and help the habitat stay on track.

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

Habitat Construction

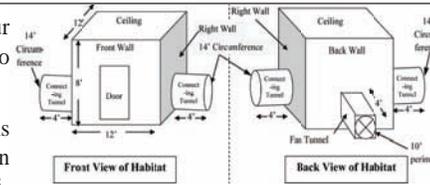
- The door panel should be taped on the inside front wall of the habitat.
- Think *short* and *fat* when taping fan and connecting tunnels.
- The fan tunnel is located in the middle of the back wall *near the ground*. Cut the hole for the fan tunnel as close to the floor as possible.
- The connecting tunnels should be taped and flanged prior to

connecting to your habitat, also as close to the floor as possible.

- Your connecting tunnels connect to the tunnels on either side of your habitat. Your habitat CREW helps tape the connecting tunnels on *both* sides together.

NOTE: *The end habitats in your colony will not have habitats on both sides to connect to. See your Link-Up Day site's floor plan.*

- DO NOT PRE-CUT A HOLE IN



THE WALL FOR THE CONNECTING TUNNELS—the official link-up will occur after lunch on Link-Up Day.

- Grey tape is very forgiving; it can make up for slightly mismatched pieces of plastic.

NOTE: *Each Flight Director takes*

his/her completed habitat back to Earth to display at his/her school after completion of Link-Up Day.

Link-Up Day Dates and Sites

Date	Site	# of Habitats
28 April 2011	Roswell	2
6 May 2011	Albuq. Conv. Ctr.	62
13 May 2011	Las Cruces	14

MM MYM Held

The Albuquerque Mars Missions Mid-Year Meeting was held 17 February 2011, with regional meetings following soon after that.

Teachers received habitat plastic, practiced assembling habitats, and received information and tips for

having a successful Link-Up Day experience from Director Ronda Cole.



Mars-500 Crew "Walks" on Mars

Mars Missions Flight students aren't the only ones simulating a manned mission to Mars.



The European Space Agency's six-man Mars-500 crew recently reached the halfway point of their 520-day

simulated manned Mars mission, "landing" on the Red Planet. Two members of the Mars-500 crew, in full spacesuit gear, simulated walking on Mars and taking soil samples.

For more information, see www.esa.int/SPECIALS/Mars500/index.html.



DoD STARBASE Flight

Very, Very Small—and Very, Very Cold

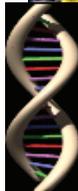
For Day 2 of the second semester of the DoD STARBASE Flight, sixth grade students are thinking small. *Very, very* small.

They're exploring the world of *nanotechnology*—the study and manipulation of matter at a scale of 1 to 100 *nanometers*. What's a nanometer? Oh, not much—just a *billionth of a meter*, that's all! It's way smaller than even a single red blood cell—that's about 10,000

nanometers wide! The width of a single helix of DNA would be more like it—that's about 2.3 nanometers. It's so small, it requires a *scanning electron microscope* just to see it.

Students explore the properties of several *nanoengineered* materials (manipulated on a nano scale to have special properties) and compare them to regular materials.

For example, students place regular sand in a glass of water, and some nano-engineered sand in an-



other glass, and observe the difference. The regular sand, they observe, is *hydrophilic*—it attracts water, while the nano-engineered sand is *hydrophobic*—it repels water, allowing an underwa-

ter sand structure to repel moisture and retain its shape.

Don't forget to turn in your Media Release Forms!

For Day 3, students aren't thinking small, they're thinking *cold*. *Very, very* cold.

That's because AFRL cryogenics technician Mr. "Cryo" Mike Martin and his fellow teammates do an interactive cryogenics demonstration with the students, using very cold liquid nitrogen. Students explore flash-freezing marshmallows, balloons, flowers, and other objects while learning about *states of matter* and *thermal dynamics*.

At least one week in advance, please give us the name of each adult per driver's license, the last four digits of their Social Security Number, and the estimated number of students you're bringing.



PETES Flight

Providing Engineering and Technology Experiences for Students Flight

Light Music

Seventh grade PETES Flight Day 2 students are discovering that "light music" may not always refer to the Easy Listening station on the radio.

In the Listening to the Light activity, students hook up a radio or MP3 player to a light source such as a light-emitting diode or a laser. Then they take a solar panel and hook that up to a speaker, and shine the light on the solar panel.

The students discover the sound is transmitted *over the light beam*



into the solar panel, and out the speaker.

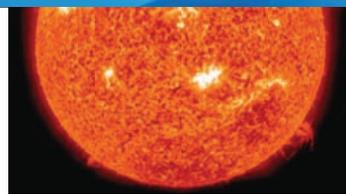
Yes, it's the next generation of MP3 player: the *lightPod!*

Other Day 2 activities include Happy/Sad Balls, where students explore materials science by testing the "bouncability" of balls made of different materials.

Speaking of Space Weather...

The biggest solar flare in four years erupted on the sun recently, sending large amounts of charged particles and radiation towards Earth.

The Jupiter-sized X-class flare (the biggest kind) knocked out radio communications in China, resulted in some planes altering flight paths, and potentially affected power grids and satellites as well.



Part of the coronal mass ejection struck Earth on Valentine's Day, 14 Feb 2011, and lit up the *aurora borealis* (the Northern Lights).

For more information, see <http://www.digitaljournal.com/article/303708>.

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Intro to Systems Engineering Flight

If You Build Them, They Will Run

Eighth grade Intro to Systems Engineering Flight students participating in Day 2 are making an interesting discovery about their Boe-Bot® robots. It's a thought that flickers through their minds like a softly-spoken whisper:

If you build them, they will run.

After receiving some of the programming skills they learned in Day 1, the students divide into two groups, the *servo group* and the *chassis group*.

Using *flowcharts* to guide them

through the process, the two groups begin assembling their small, wheeled Boe-Bot® robot.

The servo group centers their *servo motors*, removes the *servo horns*, and mounts the servos on the chassis.

The chassis group mounts hardware such as the battery pack and wheels, and attaches the *stamp board* to the chassis.

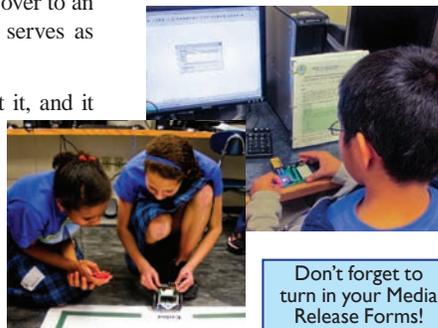
Then the students work on programming their Boe-Bot® to move the way they want them to.

When the students finish the program and download it into their Boe-Bot®, they carry it over to an obstacle course, which serves as their "Field of Dreams."

Sure enough, they built it, and it runs! They run the program, and observe the Boe-Bot® as it moves through the course, following the path they programmed into it.

Oftentimes, the students will have to take the Boe-Bot® back to the computer to refine

the program a bit, before testing it on the obstacle course again.



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STEM Challenge Flight

(formerly the SPACE Flight)

A Systems Engineering Approach to STEM Projects

Let Me Qualify That



Qualifying Reviews (QRs) have begun.

However, let me *qualify* that by saying that some STEM Challenge teams still need to schedule their QR. Have you scheduled yours?

Prepare your QR briefing and materials carefully; the Review Team will be looking to see if your project *qualifies* to move on to the STEM Challenge Symposium.

Symposium Approaching Rapidly

After passing the Qualifying Review, STEM Challenge Flight students should start planning for the STEM Challenge Symposium, Tuesday, 19 April 2011.

There are two parts to the STEM Challenge Symposium: student briefings, and demonstrations of the projects at display booths.



The briefing should run 10 minutes at most. Electronic and hard copies of the annotated briefing are due one week prior to the Symposium.

Teams will be supplied with a 2' by 6' table for the booth. Any special needs for the booth (i.e. electrical outlet) are also due one week prior to the Symposium.

The Next Step...



1. Continue working on your project
2. Update your deliverables and prepare your QR briefing
3. Schedule your QR by 8 April 2011
4. Begin planning your Symposium booth and presentation
5. Have fun with your STEM project!



Implement Your STEM Projects, Fellows!

Keep working on implementing your STEM projects in your classrooms, Fellows.

Remember, if you need assistance, we are here to help. If you are running into any issues with your materials or you feel you could use some technical expertise from a scientist or engineer, please contact Ms. Diane MacAlpine at (505) 853-8110.

We're looking forward to hearing about your classroom activities at the Teacher Institute Symposium.



The Next Step...

- Continue implementing your STEM lesson plan in your classroom
- Start **planning and preparing your presentation** for the Teacher Institute (TI) Symposium
- **Mark your calendars** for the date of your TI Symposium: 26 April from 5-7 pm, or 30 April from 10 am to noon
- **Let us know** if you would like a scientist or engineer to help you and your class complete your STEM project, or if there's anything else we can do to help you implement it

AFRL LA LUZ ACADEMY

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Important Terms and Acronyms

- AF:** Air Force
- AFB:** Air Force Base
- AFRL:** Air Force Research Laboratory
- AFRL/RD:** The Directed Energy Directorate of the AFRL (formerly AFRL/DE)
- AFRL/RV:** The Space Vehicles Directorate of the AFRL (formerly AFRL/VS)
- CSI:** The Mars Cave Skylight Investigation mission
- DoD:** Department of Defense
- KAFB:** Kirtland Air Force Base, Albuquerque, N.M.
- LF:** Leadership Flight
- PETES:** Providing Engineering and Technology Experiences for Students
- PRS:** Phillips Research Site
- R&D:** Research and Development
- STEM:** Science, Technology, Engineering, and Math
- TI:** Teacher Institute
- T²:** Technology Transfer
- TTE:** Technology Transfer for Education
- USAF:** United States Air Force

STEM Bytes

Inclement Weather Info

Brrrr! Due to issues related to the recent inclement weather in early February, some of our classes need to be rescheduled. If you have already rescheduled your class with us, please don't

forget the new date! If you haven't, please give us a call.

Also, if your school is on a two-hour delay the



day of your scheduled class with us, the class will be cancelled here. We will work with you to reschedule that class.

FYI, if Kirtland Air Force Base is closed due to the weather, then so are we.

Looking For Leadership Flight Students

We are looking for 15-20 middle school students to help as members of Mission Control for our Mars Cave Skylight Investigation Mission Link-Up Day event on **Friday, 6 May 2011** at the Albuquerque Convention Center.

To qualify, a student must:

- Exemplify Air Force Core Values (*Integrity First, Ser-*

vice Before Self, Excellence in All We Do)

- Demonstrate ability to work independently

If you would like to nominate any students to be Mission Control members for this event, please contact Ms. Ronda Cole at 846-8042 or ronda.cole.ctr@kirtland.af.mil.



Upcoming Events

AFRL La Luz Academy will have a booth at two events in March:

- Chamiza Elementary Family Science Night, 8 March 2011
- The NM Legislature Math and Science Day, 11 March 2011 at the Roundhouse in Santa Fe

Substitute Educator



Ms. Claranita Williams, a physics teacher and NM Army National Guardsman, is substituting as Educator while Ms. Esti Gutierrez is on extended leave.

Welcome, Claranita!

Coming Next Issue...

- Things to Bring to Link-Up Day
- Space Stations and Laws of Motion
- Finalize your STEM Challenge presentation



Watch for it!

Interested in being a judge for the "Central NM Regional Science and Engineering Research Challenge" science fair, 18 March 2011? Contact Mr. Jerry Cross at (505) 228-6768 or jeraldross@comcast.net.