



The Dryden X-PRESS

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NASA Technology

Bobby Braun informs Dryden's workforce of changes

By Jay Levine

X-Press Editor

NASA Chief Technologist Bobby Braun told Dryden employees Aug. 12 that he is dedicated to his role as "the agency's technical champion" and restoring and coordinating NASA's technology efforts.

NASA Administrator Charlie Bolden recently created the Chief Technologist position in response to President Barack Obama's focus on technology and innovation. Bolden asked Braun to oversee coordination of NASA technology efforts to focus on technologies that can be used across many areas, while raising the readiness level of emerging innovations.

Agencies involved with technology and research all had budget increases



ED10 0226-05

NASA Photo by Carla Thomas

Patrick Chan, second from left, explains components of the Dryden-developed fiber optic strain sensing technology to Bobby Braun, second from right. Also in the photo are Tom Horn, left, and Robbie Schingler, right.

in a time when most other government organizations saw flat or decreasing funding, Braun said.

"He [President Obama] is sending us a strong message that this administration is committed to a research, technology and innovation agenda. They believe in it very strongly, as do I. I believe in a research and technology agenda because that is key to our economic prosperity. It [technology] creates high-tech jobs, business and industries," Braun said.

Aside from economic benefits, he noted, other areas that will see dividends from technology development are national security, environment and energy. Also,

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GRIP mission begins

Scientists, graduate students and NASA flight crewmembers came together in August for missions aboard the agency's Dryden-based DC-8 and Global Hawk aircraft in NASA's Genesis and Rapid Intensification Processes, or GRIP, hurricane study mission.

A Global Hawk departed Dryden Aug. 28 on a 15-hour flight that took it over Hurricane Frank in the eastern Pacific Ocean, about 250 miles off the southwestern tip of Baja California. The sensors and instruments on the remotely

operated aircraft observed the storm's environment and inner structure while flying a descending "square spiral" pattern over the storm.

The DC-8 flying science laboratory departed Ft. Lauderdale, Fla., Aug. 30 on a second science flight over Hurricane Earl west of St. Croix, U.S. Virgin Islands. The converted jetliner flew an eight-and-a-half-hour science flight Aug. 29 over the hurricane at altitudes of 33,000 and 37,000

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Initiative and tool aimed at improving Dryden planning

By Jay Levine

X-Press Editor

A project management initiative and a new software tool are expected to increase the center's efficiency by as much as 30 percent. The idea is to better integrate schedules to meet customer deadlines, while decreasing employee stress and carving out more time

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Making progress

SOFIA enjoys success in meeting new test milestones

A second segment of flight tests with the telescope door open has been completed with NASA's Stratospheric Observatory for Infrared Astronomy. The tests are part of multi-stage efforts to prepare the observatory for early science missions, expected to begin late this year. The highly modified SOFIA 747SP aircraft now has a telescope cavity door-open flight envelope fully cleared for astronomical science missions at up to 45,000 feet altitude and all observing elevations.

The second segment of flight-envelope-expansion tests began June 23 and encompassed 12 flights totaling 49 airborne hours. Test points included evaluation of the aircraft's performance, handling qualities and structural characteristics. Test data were collected to quantify airframe and telescope cavity acoustic and vibration characteristics at the highest elevation angles. Results of testing during these and previous flights will be used to establish the flying observatory's airworthiness for its 20-year operational lifetime.

After reviewing data following the Aug. 4 final flight, the SOFIA engineering team has cleared



ED10 0182-04

NASA Photo by Jim Ross

The SOFIA flies one of the open-door missions comprising the second series in a multi-stage effort to prepare the observatory for early science missions, expected to begin late this year.

the aircraft to proceed to final verification and validation ground testing of all systems required to begin science observation flights, said Brent Cobleigh, SOFIA aircraft project manager.

The aircraft project team will complete installation and checkout of remaining research systems that support telescope operations. When this is completed later this year, infrared astronomy science

missions with the observatory will begin. Cobleigh said SOFIA program staff is working toward a goal of routine operations eventually reaching 960 research hours per year, flying three to four nights per week.

NSSC puts answers to frequent questions at your fingertips

The NASA Shared Services Center has a new, Web-based tool that puts nearly a thousand frequently asked questions at the fingertips of website end users. The FAQs are easily accessed through a user-friendly search mechanism and can also be browsed by service categories.

The site ranks FAQs by popularity. End users can rate comments on a four-star scale and provide feedback so content weaknesses can be addressed. The feedback can be provided anonymously and takes only seconds to share.

When an NSSC customer views an FAQ, the system automatically recommends related content that other who viewed the same FAQ found helpful. If a customer cannot find the answer they seek, the capability to provide general feedback is also present; this allows the NSSC to create a new FAQ to aid future customers seeking the same information. A method for electronically submitting a help desk case, to request that a specific issue be addressed by the Customer Contact Center, is also provided.

The NSSC Information Center also provides a significant upgrade to the NSSC website's search capabilities. The software "crawls" FAQs, Web content, and public documents in the NSSC TechDoc electronic library. This enhancement will allow end users to find service delivery guides, reference materials and other documents. The improved site search function simplifies site navigation and helps ensure that customers find the specific page they seek.

Future upgrades will allow employees to create a personalized account using existing agency login credentials. Within the account, employees will be able to subscribe to FAQs and receive notifications when they are updated or changed. The account will record prior comments submitted and prior FAQs viewed so customers can revisit information.

The NSSC Information Center is fully integrated with the existing Customer Service portal. It can be accessed at <http://www.nssc.nasa.gov/customerservice>.



ED10 0191-37

NASA Photo by Tom Tschida

A summer Odyssey that inspired

A group of students participated in the weeklong Bohn-Meyer Math and Science Odyssey Summer event in which they were introduced to aeronautical concepts. The entering seventh graders are pictured here on a tour of Dryden with the NASA 747 Shuttle Carrier Aircraft in the background. Marta Bohn-Meyer, a Dryden engineer who perished in a 2005 aerobatic accident, had been a significant supporter of math and science education and was a regular speaker at the Math and Science Odyssey supported by the center and held annually at Antelope Valley College. That event, which was renamed in Bohn-Meyer's honor, is expected to take place in 2011.

Meeting NASA people

Students involved in NASA education programs had an opportunity to hear from an agency education representative, an astronaut and NASA Administrator Charlie Bolden at a July 29 event. Groups like these at each NASA center were permitted to ask Bolden a question during the event.



ED10 0201-14

NASA Photo by Carla Thomas

News at NASA

U2 and ISS rock the sky

NASA and Irish rock band U2 have released a commemorative video highlighting a year's worth of collaboration in space and on the band's "360 Degree" tour.

U2 approached NASA in 2009 with an idea to include a dialogue between the band and the crew of the International Space Station during U2's world tour. The astronauts of Expedition 20, the crew then living aboard the space station, agreed to participate and spoke with U2 several times before recording a video segment the band incorporated into its concerts.

The ISS crewmembers were Michael Barratt of NASA, Frank De Winne of the European Space Agency, Bob Thirsk of the Canadian Space Agency, Koichi Wakata of the Japan Aerospace Exploration Agency, and Gennady Padalka and Roman Romanenko of the Russian Federal Space Agency.

"By combining their world tour with the space station's out-of-this-world mission, more people – and different people than our normal target audiences – learned about the ISS and the important work we are doing in orbit," said Bill Gerstenmaier, NASA's associate administrator for Space Operations. Speaking onstage in Houston last year, the band's lead singer, Bono, said, "These are the very best people in the world – dedicated to figuring how our little planet exists in this cosmos we call home."

De Winne and Romanenko attended U2's Aug. 25 performance in Moscow and met with the band before the show.

View the video at http://www.nasa.gov/multimedia/videogallery/index.html?media_id=17779038.

The Summer of Innovation

NASA supports learning when school is out

By Jay Levine
X-Press Editor

From first steps to final mission preparations for flight, including seeing aircraft fly overhead, about 270 middle school students, teachers and chaperones learned how a NASA research project takes flight by being a part of one.

During a day at the center on Aug. 27, the students learned about aeronautical concepts like sonic booms, those thunderous noises that happen when an aircraft penetrates the sound barrier. They learned about it when they were asked to scream into a microphone held by sonic boom researcher Ed Haering shortly after arriving at Dryden, for comparison to a sonic boom generated by aircraft later in the day.

Students also saw the flight cards used to organize a research mission and attended the crew briefing prior to the flight that's held to make sure everyone knows what is going to happen and what the goals are. Students also saw the flight suits pilots wear during a mission, watched an aircraft take off on a big screen, talked to aircrews in flight and saw the aircraft fly by the hangar and then land.

The event was at a Dryden wrap-up for NASA's Summer of Innovation. NASA's Summer of Innovation supported President Barack Obama's Educate to Innovate campaign for excellence in science, technology, engineering and mathematics, or STEM, education. Dryden has supported the NASA initiative by supporting STEM programs throughout Southern California and Arizona and with participation from Nevada.

The Summer of Innovation



ED10 0258-27

NASA Photo by Tom Tschida

Dryden's Ed Haering has students yell to compare those noise levels with a sonic boom from an aircraft piercing the sound barrier later in the day.

concept for the next two years is expected to continue with a NASA presence in existing after-school and summer learning programs.

"This is a new endeavor for NASA to recognize great work by a variety of institutions, schools and universities and it is meant to enhance existing summer programs to include NASA messages about STEM," said Russ Billings, K-12 program manager and coordinator for Dryden's Summer of Innovation efforts.

The Summer of Innovation program reached thousands of middle school teachers and students across the nation and was designed to encourage and inspire students in math and science-based

education programs. NASA's goal is to increase the number of future scientists, mathematicians and engineers, with an emphasis on broadening participation by low-income, minority students. NASA efforts this summer were intended to support a number of programs aimed at boosting learning, particularly for underrepresented students across the nation.

The event at Dryden introduced students to the center's work aimed at suppressing or reducing the intensity of sonic booms. Students from as far away as Las Vegas were part of the interactive demonstrations and briefings, capped with a pair of actual sonic booms – one normal and

one greatly reduced in intensity – created by a NASA F/A-18 flying at supersonic speed high over Edwards Air Force Base.

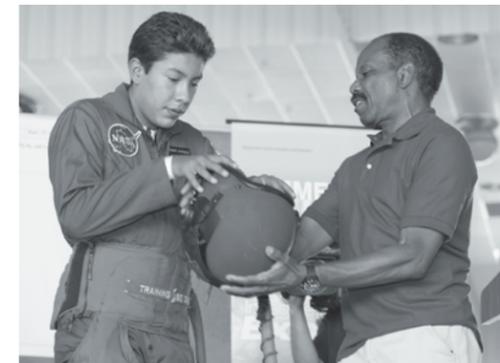
Although startling, the "boom-boom" created by the sudden increase and decrease of air pressure trailing from an aircraft flying at supersonic speeds is generally harmless. However, the annoyance factor has led governmental agencies to ban supersonic flight over land, except in restricted military testing airspace. Dryden's research is exploring various means of reducing the perceived impact of sonic booms, including reshaping of aircraft structures and changes in flight profiles.



ED10 0258-15

NASA Photo by Tom Tschida

Dovie Lacy, Summer of Innovation project manager, gives students a thumbs up.



ED10 0258-61

NASA Photo by Tom Tschida

Bobby McElwain, right, assists Danny Medina with dressing in a flight suit.



ED10 0258-80

NASA Photo by Tom Tschida

Alana Austin, right, poses a question to the flight crew of an F/A-18 on a mission.



ED10 0258-42

NASA Photo by Tom Tschida

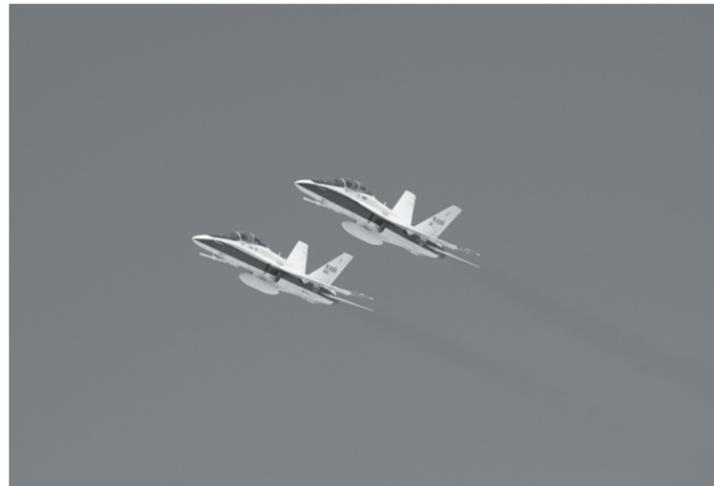
Using flight cards provided to each of them, students follow along during a crew brief.



ED10 0258-84

NASA Photo by Tom Tschida

Two F/A-18 aircraft fly overhead following a test mission that visiting students followed during an event at Dryden.



ED10 0258-87

NASA Photo by Tom Tschida

Students were excited to see the F/A-18 aircraft that conducted their flight experiment.



ED10 0258-93

NASA Photo by Tom Tschida

Summer of Innovation participants had an opportunity to see inside an actual F/A-18 aircraft cockpit.

Initiative ... from page 1

for research, training and planning.

Project planning was identified during the January 2010 Safety Day as the number one area that needed work to improve the balance between work and home lives, said Center Director David McBride at an Aug. 24 town hall.

As a response, Dryden managers are adopting a new initiative called Critical Chain Project Management that is designed to synchronize and integrate multiple projects to eliminate constraints. In this concept, resources are made available to a project through its completion, Associate Director for Planning Dennis Hines said.

CCPM is based on the Theory of Constraints, the concept that a system can work only as fast as its slowest component, or constraint. A constraint can be a machine, aircraft or person, Hines explained.

In the past, a key project or two has monopolized center resources, which has required a shifting of priorities. Along those lines, a recent NASA audit determined that some employees are working on as many as 10 projects in a single week. The new initiative is aimed at reducing some of those employee stresses associated with multi-tasking, McBride said.

The new software works with Dryden's current project management software and will be used to provide better information about what projects are scheduled to do and when by looking at a single database. Also of importance, the software helps identify where there are overlapping schedule conflicts and offers alternatives, McBride said.

"We have to excel at project management. It's part of everything we do at the center," McBride said.

The new initiative and software also will enable a shift in Dryden culture, McBride said. Instead of working on a number of projects at the same time, the new approach will be to apply more resources to a single project, complete it and move on to the next project.



"We have to excel at project management. It's part of everything we do at the center."

David McBride
Dryden Center Director



NASA Photo

Dryden's leadership is laying the groundwork for a new project-planning initiative designed to support success in all the center's projects, such as the Pad Abort 1 flight launched earlier this summer and pictured in the above photo.

The initiative also is expected to give managers insight into questions such as the percentage of projects completed on time, cost estimates versus actual dollars spent, the capacity to take on new work and potential constraints in meeting customer schedules, Hines said.

The Boeing Company, Delta Airlines and Hewlett-Packard saw

improvement by using the project management tool. Closer to home, Air Force Flight Test Center officials have reported significant improvement with its use, Hines said.

"Buffers" will be added to projects that will be planned in segments, so progress can be monitored. Buffers are time increments added

to a project's anticipated completion date to account for items that crop up. That includes variables such as when employees are on vacation, in training or otherwise unavailable, McBride said.

The idea is for half of the buffer to have been used by the time the project is half done, meaning that the project is on schedule and able to meet unexpected items. Replanning and contacting the customer may be necessary if the project is too far into its buffer zone. How the work is to be accomplished remains the task of the project team, McBride said.

Initially, the change might mean some delays for some projects as they are replanned, but ultimately it will allow for quicker completion times, McBride said. Such scheduling also would allow for determining if and when resources are available for a new project or for work the center does and is paid for by a customer, called reimbursable work.

"Our reputation is, we get the job done. We want to continue that but we want to stop approaching it like firefighting. We will still have to do that sometimes, but we want it to be the exception and not the norm," McBride said.

Although the first project – the G-III with the laminar flow glove – will begin using the new process right away, the changes for most of the center will be gradual. Full use of the new systems is expected to begin by the end of the first quarter of 2011, McBride said.

A core team led by Joel Sitz will begin training in September, with wider center employee training beginning in October.

It is anticipated that 80 percent of the workforce will not see changes in their day-to-day work, 19 percent will have some degree of involvement and less than 1 percent will see the tool as their primary focus, McBride said.

While most people won't see much difference day-to-day, the potential payoff could benefit the entire workforce, McBride said.

Technology ... from page 1

technology is a strong motivator and is an inspiration for young people interested in careers in science, technology, engineering and mathematics, he added.

Braun first was introduced to NASA as a young man in 1976. He lived in Maryland and a neighbor who worked at Goddard Space Center, Greenbelt, Md., brought him to work.

“It was the day Viking landed on Mars,” he recalled. “I still remember that day.

“To be honest, it wasn’t so much the science of Viking, which admittedly was amazing, or so much the engineering, which was awesome because it was the first time we sent a lander to another planet safely. For me, the thrilling part was watching all of those engineers and scientists who had worked so hard for all those years to make it happen. I knew right then that was what I wanted to be a part of.”

So he did.

His first NASA job, at Langley Research Center, Hampton, Va., focused on sending humans to Mars as part of space exploration missions. When the program succumbed to budget pressures, he was selected for a position at the Jet Propulsion Laboratory in Pasadena, Calif., where the mission was to send robotic landers to Mars. He was involved in the Mars Rover program from concept to design, and from construction to launch and operations.

“What an awesome experience,” he recalled.

Braun noted that some missions, including that of the Mars polar landing, failed. Despite the pain of working on something so long and having it fail, he said he learned from the experience.

Along those lines, Braun acknowledged that NASA has become risk-averse. While NASA must take every precaution with human space flight and large projects, research and technology can not take giant steps forward without taking acceptable risk

with smaller, focused development projects. Acceptable, but not foolish risk is required, he said, to push the barriers of technology and research toward extending or breaking through real or perceived barriers.

“The agency has become too risk-averse, and that cuts across the agency particularly when talking about technology and projects where we are reaching to achieve some grand challenge. If we can’t take risks, what are we doing?

“There is an uncertainty in everything we do in technology, and we have to be able to understand that and accept that,” he said.

Small, focused efforts in technical areas need to make acceptable risks and reduce the time from concept to flight and increase the readiness level of the technology, he added.

Braun referenced a famous NASA project for which Dryden conducted the flight research, the Lunar Landing Research Vehicle. The LLRV was used to validate concepts for a vehicle that could land on the moon. It also was a program that moved from concept to flight test in two years, in the early 1960s.

“That’s technology development. That’s acceptable risk. A few vehicles crashed, but we did not cancel Apollo.

“You know how to go from concept to flight,” he said to the Dryden workforce. “You know how to do that quickly. In fact, you might know perhaps better than anyone else in the agency how to do that.”

Braun noted a decline in technology competencies during the past decade, saying that the challenge of restoring research and technology is what brought him back to NASA. The effort is aimed not only at restoring research and technology, but also coordinating it among all NASA resources to prevent duplication.

Another goal is to focus on raising the technology readiness of emerging technologies and those with promising commercialization aspects.

To accomplish that, he intends to work with other NASA associate administrators to develop one voice for stimulating technology and research agency-wide. Braun sees as a key part of his job pointing out benefits and costs and, where applicable, better technology solutions that can benefit a wider range of people, which he refers to as “cross-cutting” technology.

Beginning with the 2011 fiscal year, Braun also will manage the agency’s new Space Technology program, which will be focused on foundational research and technology advances across a wide range of future missions.

Braun said the program will “seek the best ideas from anywhere, not just from NASA,” and feature open solicitations and open competitions for funding.

To make it easier for anyone to submit a proposal, he said he intends to streamline the process so that initial submissions can be just a few pages in length.

All 10 programs falling under the Office of the Chief Technologist are oriented toward taking ideas from basic concept to the working prototype or testing phases, and then transferring those concepts to applicable programs and missions, he said.

Of those 10 programs, one – Flight Opportunities – will be managed at Dryden, drawing upon the center’s experience and expertise in planning and conducting flight tests of new aeronautical and

spaceflight concepts in a relevant environment.

Initially, the Flight Opportunities program will incorporate two existing projects currently under way, the Commercial Reusable Suborbital Research, or CRuSR, and the Facilitated Access to Space Environment for Technology, or FAST, projects.

The former is focused on use of commercially developed launch vehicles for sending payloads from NASA, private industry and research institutions into space, the latter on providing opportunities for microgravity research projects, using an aircraft based at Johnson Space Center in Houston to fly parabolic profiles that provide brief periods of reduced gravity.

Prior to his all-hands presentation, Braun toured Dryden’s Flight Loads Laboratory and hangars housing several of the center’s specialized research aircraft. Dryden engineers briefed Braun on a number of technological efforts developed or under way, including fiber optic sensors for lightweight structures, laminar flow research under the Environmentally Responsible Aviation program and flight validation of propulsion and aerodynamic experiments.

Following the tour, Braun was briefed by Dryden project staff on adaptive and structural control technologies, flight validation of analytical codes and integrated networks for aircraft.

Dryden News Chief Alan Brown contributed to this report.

Sept. 7, 1947 – The NACA Muroc Flight Test Unit was designated as a permanent facility reporting to NACA Langley, Va.

Sept. 14, 1967 – The X-24A arrived at the NASA Flight Research Center inside a C-130 cargo plane.

Sept. 16, 1999 – The NB-52B (52-0008) made its 1,000th flight. The crew consisted of Ed



Schneider, Frank Batteas and David Dennis.

Sept. 27, 1999 – The SR-71A (61-7980/NASA 844) made its last research flight. Rogers Smith and Marta Bohn-Meyer flew the aircraft.

Mission... from page 1

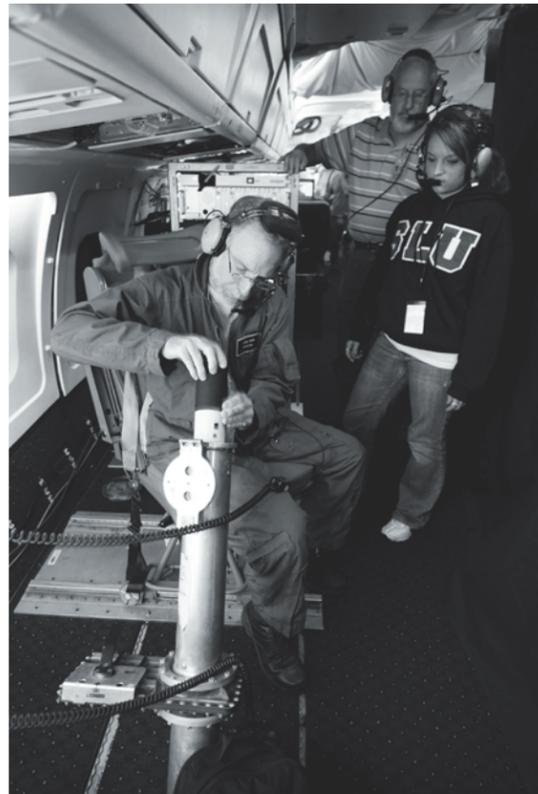
feet, and then descended to 7,000 feet northwest of the storm area to collect measurements of atmospheric aerosols.

The first DC-8 flight originated in St. Croix but diverted to land in Fort Lauderdale due to the degrading weather forecast for St. Croix associated with the approaching hurricane, whose strength had been increasing during the weekend.

The science laboratory completed a seven-and-one-half-hour flight Aug. 24 over the Gulf of Mexico to probe an area of convection in the Gulf for signs of development and vorticity.

The flight pattern for that mission involved a "lawn mower" pattern over the Gulf at cruise altitudes ranging from 33,000 to 39,000 feet along a line between Louisiana and Merida, Mexico, the U.S. Gulf Coast region and Cuba. A spiral descent and ascent was performed between 37,000 and 27,000 feet.

Twenty-four dropsondes were dropped from the plane, all of which transmitted atmospheric data, and all of the sensors installed on the DC-8 for the GRIP mission were operating. Dropsonde, or dropwinsonde, instruments are fitted with Global Positioning System receivers to measure atmospheric-state parameters (temperature, humidity, wind speed/direction, pressure) and location in three-dimensional space once every half-second during the sonde's descent. Measurements are transmitted to the aircraft from the time of release until the instruments, which are



NOAA's Errol Korn, left, deploys a dropsonde experiment over the Gulf of Mexico during the first GRIP flight Aug. 17, aboard NASA's DC-8 flying laboratory. Janel Thomas, a University of Maryland graduate student, and Bob Pasken look on.

NASA Photo
by Paul Alers

jettisoned from the aircraft, impact the ocean surface.

The flight also underflew NASA's Aqua and Tropical Rainfall Measuring Mission satellites to compare space-borne measurements with those taken on board the aircraft.

For the first mission, the DC-8 flew on Aug. 17 into the remnants of Tropical Depression Five over southern Louisiana, the aircraft's interior abuzz with activity as various instruments for the first in-situ test were readied.

The aircraft departed at 11

a.m. EDT from base at the Fort Lauderdale airport and headed west toward the remnants of Tropical Depression Five along

the Gulf Coast. During the flight, National Oceanic and Atmospheric Administration scientist Errol Korn deployed a dropsonde experiment over the Gulf of Mexico during the flight as Janel Thomas, a University of Maryland-Baltimore County graduate student looked on.

In another part of the DC-8, Michael Kavaya of Langley Research Center, Hampton, Va., principal investigator for the DAWN – Doppler Aerosol WIND – lidar experiment checked over data with Langley's Jeffrey Beyon. The DAWN instrument will provide vertical profiles of components of three-dimensional wind in the region below the aircraft.

The GRIP project is a NASA Earth science field experiment being conducted Aug. 15-Sept. 25 to improve understanding of how tropical storms form and develop into major hurricanes. The mission entails use of several NASA satellites, three Dryden aircraft and 14 instruments, nine of those aboard the DC-8. A WB-57 aircraft from Johnson Space Center, Houston, is also being used.

Holiday activities on tap

The Dryden Exchange Council has set the dates for annual holiday events.

The Halloween chili cook-off and costume contest will be Oct. 28, from 11:30 a.m. to 1 p.m. in the ISF auditorium.

Dryden holidays will kick off with a dinner party on Dec. 18.

The annual children's holiday party will be Dec. 18.

Limited tickets, at \$45, are still available for the Oct. 10 NASCAR racing event in Fontana. The NASA ski trip to Aspen, Colo., will be Jan. 22-29.

For ski trip information, contact Ethan Baumann, ext. 3417.

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