SINCE THE LAST ISSUE OF THE ROUNDUP, so much has taken place at NASA's Johnson Space Center and around our nation. We saw a spectacular total solar eclipse across America, welcomed a new class of astronauts to campus, endured a natural disaster and witnessed a test of the human spirit.

In Texas, our center, the Houston region and Gulf Coast coped with the unimaginable impact of Hurricane Harvey. In this issue, you will read about how our team members worked around the clock to ensure our facilities and infrastructure were managed effectively during the storm, and learn how we were able to keep our operations teams focused on mission control and the James Webb Space Telescope testing. You will also read about the incredible ways people have come together to comfort one another and lift each other up.

It is amazing what our employees have done to weather the storm, protect and support each other, continue essential operations and volunteer in so many ways throughout the community. While our center experienced flooding during the heaviest rains, our main campus buildings did not flood. I am so proud to represent Johnson—the focus, perseverance, resiliency and strength of all our employees inspire me and many others.

After the hurricane passed, our team worked quickly to get our campus ready for everyone to return to work. We were well prepared and supported during and after Harvey. I’d like to take this opportunity to express my gratitude to our employees for taking care of one another and to all of our colleagues from around the nation and world who reached out to offer support. I’ve heard many stories and witnessed firsthand how many team members were personally impacted by Harvey; as we’ve worked alongside one another to help our fellow team and community members recover, our team demonstrated both compassion and strength.

Many people came together to ensure the Johnson team was well cared for. Many of you jumped right in to see how you could help and provide resources to our community. You were incredibly responsive by quickly standing up a Recharge and Refresh Station, providing step-by-step guides for impacted homes, researching financial support and transportation options, organizing volunteers for cleanup and many more activities.

Your generosity was also on display for our JSC Feeds Families campaign. To begin the campaign, we established an ambitious goal to collect more than 50,000 pounds of food. After Harvey hit, donations flooded the center. Many of those donations were taken immediately to people who needed them. The rest went to our stuff-the-truck event. Based on what we’ve counted, our employees donated more than 130,000 pounds of food and supplies.

Despite the many obstacles that the storm placed in our way, our dedicated team members worked hard to ensure our crew members aboard the International Space station were taken care of. Just days after Harvey passed over Houston, we welcomed Expedition 52 crew members Peggy Whitson, Jack Fischer and Fyodor Yurchikhin back to Earth, and Peggy and Jack returned to Houston. As our community continues to rebuild, I am proud of our employees for remaining Houston Strong!

The director of JSC

Ellen Ochoa

IMAGE OF THE QUARTER

This image of Saturn’s northern hemisphere was taken by NASA’s Cassini spacecraft on Sept. 13, 2017. It is among the last images Cassini sent back to Earth. The view was taken in visible red light using the Cassini spacecraft wide-angle camera at a distance of 684,000 miles (1.1 million kilometers) from Saturn. Image scale is 40 miles (64 kilometers).

The Cassini mission—managed at NASA’s Jet Propulsion Laboratory—is a cooperative project of NASA, ESA (the European Space Agency) and the Italian Space Agency.
MOST EVERYONE KNEW THAT AS HURRICANE HARVEY traveled north after making landfall near Rockport, Texas, it would be a rainmaker. Most everyone also knew that it would cause significant flooding for the Houston area. But even people who had seen disastrous quantities of rain before, like with Tropical Storm Allison in 2001, could not be mentally prepared for the onslaught of Harvey, which prompted the National Weather Service to issue a “Flash Flood Emergency for Catastrophic Life Threatening Flooding” for the first time ever. On Aug. 25 in the evening hours, which many would consider just “Day 1” of Harvey over Houston, the worst-case scenario was happening. NASA’s Johnson Space Center in Clear Lake—a suburb of Houston—was on the receiving end of rain bands that continually fed off of Gulf of Mexico moisture, stalled and never left. At least, it felt like never to many people who, at home, were watching water creep up their yards and driveways. For some, the water never made it inside. Many others in the Johnson family could not say the same.

While the ride out team was dealing with water, the Mission Control Center (MCC) was humming along—albeit with some noticeable differences from the norm. The Rocket Women blog highlighted a few of the flight controllers who rode out the storm in the MCC and some of the makeshift plans that happened as the hurricane unfurled outside the windowless building.

“I actually wasn’t scheduled to be on console for Hurricane Harvey,” said Fiona Turett, Attitude Determination and Control Officer, or ADCO, in mission control. “I was planning for a quiet, wet weekend stuck at my house. However, the person scheduled to work Orbit 1 (the night shift) lives about 30 minutes away. He was super proactive and tried to come in over two hours before his shift, but the roads were already flooded where he was. I live just a few minutes from NASA and got a call from my manager at about 9:15 p.m. on Saturday night asking if I could cover the shifts. I had already thrown some clothes in a bag just in case, so I added some food, grabbed my pillow and suitcase and rushed over to work.”

However, no matter how bad the flight controllers heard that the storm was, they knew they had an important job to do.

“Our goal on console was just to keep the crew safe and the vehicle working, minimizing any complicated tasks that could be postponed,” said Jessica Tramaglini, Jeffrey Haught, Johnson’s ride out team captain, had the herculean job of maintaining center operations as rainfall tested the center’s tangible limits.

Alongside the greater team, Haught prioritized incidents as they rolled in.

“We are charged with assessing resource needs and orders from ongoing missions,” Haught said. “We maintain the security of the center and the infrastructure integrity as much as can safely be done during actual storm ride out.”

Haught experienced the many “other duties as assigned” that workers often joke about, which included inspecting buildings in between rain bands and getting on roofs to unclog drains.

“It was important to the folks that had ongoing missions to be able to continue with their efforts with as little impact as possible,” Haught said. “I had a fantastic support team working the facility and leak issues as we learned of them. It was truly an honor to be able to help them continue their efforts in spite of Harvey.”

Rain, rain, go away

Even with subsequent closure of the center in anticipation of the epic rains that were to come, critical mission operations were still ongoing, complete with a hurricane ride out team to help support. Jeffrey Haught, Johnson’s ride out team captain, had the herculean job of maintaining center operations as rainfall tested the center’s tangible limits.

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“Our goal on console was just to keep the crew safe and the vehicle working, minimizing any complicated tasks that could be postponed,” said Jessica Tramaglini,
definitely understood that a hurricane—even one like Harvey—was always a possibility.

“We have many back-up systems that can operate using diesel generators and motors to handle a loss of center utilities,” said Jonathan Homan, Johnson’s project manager for testing the James Webb Space Telescope. “We made ride-out preparations. This included items like air mattresses and bedding, food and water, and extra supplies to make covers or tents for critical equipment that we did not want to get wet. Many of these were used.”

Indeed, the massive rains Saturday through Sunday did breach the building in many locations. While Center Ops dealt with diverting water intrusions, the test team rapidly built protection for the electrical systems.

One issue encountered had to do with keeping thermal vacuum Chamber A, where the infrared telescope is experiencing the bone-chilling temperatures of deep space, sustained with liquid nitrogen.

“After the larger rain events and subsequent flooding in the Houston area, it became extremely challenging to schedule and receive liquid nitrogen deliveries to maintain the integrity of cryogenic vacuum testing,” Haught said. “As much nitrogen as possible was moved within center resources until the standard delivery methods and routes could be verified.”

Another challenge was the human aspect of the operation.

“The testing was not interrupted, but a decision was made to reduce the number of personnel on shift,” Homan said. “Then, for many who could travel moderately safely, we asked them to work 12-hour shifts instead of eight-hour shifts to reduce numbers on the road. This did reduce some of the planned test points.”

But even during a storm touted as unprecedented, beyond a 500-year event, the team held together Webb’s final, comprehensive evaluation thanks to lots of ingenuity and even more planning.

“Having the storms in 2015 showed us many vulnerabilities,” who operates the International Space Station’s power and external thermal control, or SPARTAN console, in the MCC.

While sleep was hard to come by for many of the controllers, makeshift cots were set up in surrounding MCC areas to support the personnel who couldn’t leave due to the road conditions and needed to catch whatever rest they could.

“You can imagine how tired everyone was,” said Dorothy Ruiz, Ground Control. “Also, some etiquette rules were lifted for frozen foods in the refrigerators. All the frozen food there was fair game if someone didn’t have any food to eat.”

While no one would ever elect to go through another Harvey, it did create some unforgettable moments for those manning the control center.

“On the bright side of things, there was time for bonding between all of us, some stories to share and an opportunity to know people through their personal stories,” Ruiz said. “We also witnessed the generosity from others, who cooked meals in their houses and brought the food to MCC so we could eat homemade meals and fruit. We saw messages of encouragement from astronaut Peggy Whitson and from kids in Chicago, who sent us drawings thanking us for the time and sacrifice riding out the storm at MCC.”

Oddly, the never-ending rain that evoked so much anxiety for everyone else was, for them, this nebulous event.

“It was a bit surreal, because we couldn’t even hear the storm,” Turett said. “I never saw it with my own eyes.”

Staying chill

The James Webb Space Telescope, in theory, could have picked a better time to stopover at Johnson for testing. But, coupling the Texas coast and hurricane season meant that the James Webb team
and doing the three major James Webb Space Telescope pathfinder tests prior to the flight test not only helped us work out normal operations—it was a training ground for emergencies," Homan said. "The test team really thought about many issues, and we were prepared."

... and when to call it a day

On day 23 of the 45 planned mission days for NASA’s Human Exploration Research Analog (HERA) XIV, the crew received word that they had to leave the habitat and evacuate the center.

For Flight Analogs Program Manager Lisa Spence, saving the mission was a priority, but it was not the top priority.

“We had many people working on this mission, inside and outside of the habitat,” Spence said. “Keeping all of them safe was our most important consideration.”

The HERA team had already been handling the obstacles Harvey had put in their path, such as ferocious winds and leaks from the 45-foot ceiling dripping just feet from their mission control computer equipment. However, once the safety of the staff was at risk—as evidenced by the morning console crew’s vehicle taking in water and nearly flooding en route to the center—Spence called off the mission.

The crew was instructed to pack up their astronaut food from the habitat, and a Center Ops van took the crew to a hotel.

All four HERA XIV crew members agree that ending the mission was the right thing to do.

“We really gelled,” said Shelley Cazares, Ph.D., a HERA crewmate hailing from Washington, D.C. “Even in the hotel, we continued to have a crew mentality and depended on each other to get through this stressful situation.”

Pulling together

Harvey came … and slowly, very slowly, went.

Personal impacts were plentiful, and the Johnson team was not immune. Surrounding communities like Friendswood and Dickinson, where many center employees reside, experienced catastrophic flooding. Center re-opening was delayed until Sept. 5. In the meantime, folks like Debbie Denton-Misfeldt were working behind the scenes to see if the Gilruth Center could be set up as a Recharge and Refresh (R&R) Station, as it had been before after Hurricane Ike.

“The R&R at the Gilruth opened five days after Ike made landfall and offered a place to shower, cool off in air conditioning, access a computer or to recharge phones,” said Denton-Misfeldt, Starport Operations manager. “For Hurricane Harvey, we followed much the same plan that had been used for Ike since it was so well received.”

After assessing the damage out at the Gilruth Center (which ended up being manageable), the team—Center Ops, Information Technology specialists from the Information Resources Directorate and Starport—worked together to get the R&R Station up and running by Sept. 6.

“A call for volunteers went out, and in less than 24 hours, more than 150 people had signed up,” Denton-Misfeldt said. “The number quickly grew to 250 after two more days. Thanks to the many that helped get the Gilruth up and running, the R&R center was able to open Wednesday at 1 p.m. after Harvey made landfall.”

The blueprint that had worked so well for Ike also replicated its success with Harvey.

“It was rewarding that we could provide an avenue for others to help, whether it was volunteering at the R&R center, making a donation of food or cleaning supplies, or matching a work crew to someone who needed help cleaning out their home,” Denton-Misfeldt said.

These kinds of stories only grew exponentially, much like the incredible rainfall amounts. Many directorates used social media to connect those in need of a helping hand with those who had the time and resources to make a difference.

Things like paychecks, too, mattered a whole lot. While the center and agency has contingency plans that are reviewed and discussed annually, it’s the timing and impacts to employees that always add complexities, and these cannot be predicted.

“As part of our contingency plan preparations prior to the Hurricane Harvey center closure, we put the Agency Applications Office (AAO) and NASA Shared Services Center (NSSC) on notice that we might need their assistance the following week,” said Gwen Obert, chief of the Financial Management Division. “We packed up our laptops and headed home, hoping to be back in the office next week as normal. As we all know, there was nothing normal about the next week.”

After the storm, many people would still not have access to a computer, or electricity, or—homes.

“The priority was getting employees paid without them having to worry about getting into the system to record their time for the pay period,” Obert said. It was even more daunting since they, too, were dealing with their own storm impacts and challenges. “During this time, our team participated in telecoms with AAO and NSSC twice a day and assisted in manually correcting around 2,000 timesheet errors.”

With so much on everyone’s mind, this alleviated the need to worry about if and when their next paycheck would arrive. It was, at least, one less thing.
The definition of family

For those relatively unaffected by the storm, there was often a strong desire to do something, to be useful. Some offered brute muscle strength to tear out soggy sheetrock and move ruined furniture to the curb, and others tailored their giving to the more intangible.

Bruce Manners, chief of the Avionic Systems Division, decided he would lend his talents as a professional juggler to a couple shelters.

“My wife Alice and I were fortunate enough to come through Hurricane Harvey with very minimal damage to our home,” Manners said. “This was not the case for many others in Houston or across the Gulf Coast region of Texas.”

He noted that most of the people who ended up at shelters were those with virtually no support network or fiscal resources, and therefore were the most vulnerable.

“I simply wanted to bring some measure of relief and joy to those who needed it the most,” Manners said. “The folks at the two shelters I performed at were very appreciative. I was told that, in some cases, it was the first time some of these children had smiled and laughed since the storm had come through several days earlier.”

Johnson’s director, Ellen Ochoa, brought a contingency of astronauts—as well as a dash of hope and inspiration—to one of Houston’s shelters at NRG Center in a mission to spread goodwill. The smiles and the memories made were abundant (which she shared on Twitter at @Astro_Ellen), and the Johnson team left the shelter feeling buoyed and moved by the support from Space City.

Lee Feinberg, a temporary transplant with his team from NASA’s Goddard Space Flight Center, found himself in a unique position. Despite competing duties testing NASA’s newest space-based observatory in Chamber A, their team felt compelled to help out in the storm’s aftermath, as they heard numerous stories of people who needed assistance tearing apart their water-logged homes.

“Our management team was really supportive of this, and we were overwhelmed with how many people wanted to help, including some of the European team who came after working all night long on graveyard shift,” said Feinberg, the James Webb Optical Telescope element manager. “After what we had been through together to get through the storm, the volunteering felt like a real family thing. I remember one of our JSC colleagues sent us a note of appreciation and remarked how people were incredulous that there were people from Maryland helping out. But really, it just seemed like the right thing to do and the right time to do it.”

Randall Jensen, a senior learning specialist and module coordinator for the Instructor Training Course in the Flight Operations Directorate, experienced the phenomenon of “ask and you shall receive” when he left his home in Friendswood on Aug. 24 to witness the birth of his grandbaby in Arizona. On Sunday, while Harvey was squalling over Houston, baby Annie Martine made her own squall as she entered the world.

Even with the happy news, Jensen was apprehensive about his hometown and what they would encounter upon their return road trip.

“On Monday, unbelievable amounts of rain were falling along the I-45 corridor, from Dickinson to League City, Friendswood and beyond,” Jensen said. “We simply could not believe what was happening.”

Their family decided to do something about it—and pack up their SUV with supplies and donations to bring back. Jensen’s daughters, Erika and Laura, responded to his text asking for assistance by extending the plea for donations to Facebook. Families—and friends of friends of friends—responded. On Tuesday, the first person arrived at Jensen’s daughter’s home with donations. By Wednesday evening, cars were lined up all the way down the street and around the corner.

The SUV was crammed with donations that ended up in Friendswood, one of the hardest-hit areas, as well as the Gilruth R&R Station. The SUV, that is, and two 26-foot rental trucks. A news crew came out to do a story on the miracle that was unfolding before everyone’s eyes.

“My wife and daughter were literally reduced to tears as we saw the goodness of so many people,” Jensen said.

Gratitude

Who to thank? There are so many ... and unfortunately, some of those thank-yous will fall through the cracks. But our appreciation remains.

(continued on page 12)
THE RAPID PROTOTYPING LAB (RPL) at NASA's Johnson Space Center in Houston is comprised of a team that provides quick, creative and efficient solutions to an array of issues that engineers and astronauts may face during human spaceflight missions.

The lab fosters and encourages innovation to discover new and more resourceful ways to improve on existing technologies and create new ones. The RPL team applies this novel approach in developing Orion’s interactive control systems, which will be used by astronauts to operate the spacecraft beginning with Exploration Mission-2 (EM-2), when a crew will venture beyond the moon.

When the space shuttle flew, astronauts used more than 2,000 switches and relied on nearly 200 pounds of operating manuals to help them fly the orbiter. Thanks to the hard work being done by the RPL, the system the crew will use to send commands to Orion will use advanced software to streamline those switches into a new interface for the Orion cockpit, using only 60 switches around the monitors and two mouse-like cursor devices directly below the screens.

This new interface not only eliminates mass from the Orion spacecraft, but the software also makes it easier to operate the capsule by automatically generating dialogue boxes to help processes move along more efficiently. These electronic procedures aide the crew in daily and emergency processes since they are programmed into the system, eliminating the need to manually call up pages on the display and making large manuals of system operations obsolete, which saves the crew time and space.

“We always put the rapid in everything we do—it’s keeping the momentum, keeping the excitement, keeping the sense of urgency and the freshness of the idea,” said Jeff Fox, chief engineer of the RPL.

The RPL team programmed and designed the crew interface display system while also building the monitors for it. They used cost-effective technologies, like 3-D printing, to construct the frames before wiring the circuit boards in one of their labs.

Engineers have put astronauts in front of the displays to perform real-time analysis of human factors and get crew feedback on how those who fly in Orion will work with the system. The critiques give the RPL a chance to integrate that perspective into the system ahead of EM-2.

While the crew is running simulations on the prototype Orion crew interface display system, a mock mission control room is a few doors down, where flight controllers are gaining experience working and communicating with the astronauts using this new crew-vehicle interface system in real time.

The team works closely with a diverse group of engineers, system experts, flight controllers, crew, human engineering personnel and Orion’s prime contractor, Lockheed Martin, throughout the entire prototyping process to ensure the new operating system complies with human spaceflight standards.

“In the next two years, we’re going to complete the design and prototyping of the entire suite of crew displays,” Fox said. “Teams will come up with a layout, and we’ll be testing them in the simulators with the crew, getting feedback and making changes.”

While EM-2 is still a few years away, engineers at Johnson are ensuring they consider all the human elements involved in successfully flying Orion beyond where humans have ever traveled.
AT A GLANCE, SOME MAY THINK OF DESTINATION STATION as a rock band considering the many road shows it’s had during the past year. This year, the International Space Station (ISS) outreach campaign Headlined at South by Southwest, the Essence Festival, Artscape, Super Bowl LI and many more notable events. The Destination Station team also traveled to Charleston, Portland, Seattle and Washington, D.C., for meetups with industry leaders to exchange ideas on how companies could use the microgravity research laboratory to further budding technology and scientific discovery.

When not seeking industry connections, the campaign also informs the public about groundbreaking scientific investigations being conducted aboard the space station.

“Destination Station and the Driven to Explore [DTE] mobile exhibit are keys in our ISS toolkit that open doors for us to promote STEM public awareness and, most importantly, ISS utilization opportunities for research and technology,” said Lesa Spivey, ISS Strategic Communications and Partnerships lead.

The DTE mobile exhibit is a key component to the Destination Station program that uses a collection of interactive features to pull audiences into the gravity of station science. It includes a video about ISS research, a touchable moon rock, spacesuit for impromptu photo ops, astronaut food and a glove and helmet for participants to try on. There are even virtual reality goggles for people who wish to go on a virtual tour of the orbiting laboratory.

Even though the exhibit is a look ahead at the future of NASA, it also inspires reminiscing of past human space exploration. One visitor was moved to tears by the touchable moon rock, recalling how humans went to the moon when he was only in his teens. And though the campaign can spark nostalgia, it often sparks innovation as NASA connects with industry and researchers.

Destination Station partners with the Center for the Advancement of Science and Space (CASIS) to identify cities with a high concentration of industries. CASIS, a nonprofit organization that manages station as a U.S. National Laboratory, is the conduit allowing scientific, academic, commercial and nonprofit entities to get their research aboard the space station.

“Destination Station has provided a collaborative model that truly demonstrates how CASIS and NASA are powered through partnership to fully utilize the International Space Station,” said CASIS Marketing and Communications Manager Patrick O’Neill. “This collaborative model has garnered access to some of the more recognizable companies in the world, allowing the space station to tell its unique research story and, equally, discuss how these companies and researchers can benefit by leveraging microgravity.”

During Destination Station visits, the DTE mobile exhibit, a representative from the ISS Program Science Office, CASIS representatives and an astronaut team up in cities across the country to increase research aboard the station. The team conveys to varied audiences that doing research in space benefits Earth, companies’ products and services and, moreover, their consumers.

“The team is challenged to think out of the box about new and innovative research ideas,” said Dr. Camille Alleyne, associate program scientist for ISS. Research ideas generated must benefit humanity in some capacity.

What excites Alleyne is just how many companies are eager to develop their products further in a microgravity environment. The more industry is aware of this unique test bed, the more experiments can—and will—be sent to space, ultimately leading to a commercial marketplace.

David Brady, assistant program scientist with the ISS Program, went on his first Destination Station stop in Charleston during the Eclipse Across America on Aug. 21. This event attracted a
diverse pool of researchers who were excited to learn about doing experiments in space.

Brady took the opportunity to share with those stakeholders that the agency and other entities are conducting research in space that will benefit third-world countries and even help with disaster relief. There are currently about 200 different investigations being performed aboard the space station that will somehow benefit humanity.

Other cities received special attention as well. In Seattle, NASA and CASIS worked with cutting-edge companies such as Blue Origin, Microsoft and Starbucks. With Starbucks, they had a meaningful discussion about remote sensing, plant biology and the enhanced genetics of coffee beans.

While in Portland, Destination Station engaged with the public at the Oregon Museum of Science and Industry, along with the Boy Scouts and Girl Scouts. Additionally, Adidas, Columbia Sportswear and Flir heard more about how to harness the U.S. National Laboratory.

Destination Station rounded out its tour at the nation's capital. The road show engaged officials at the Pentagon, where about 500 people walked through the DTE exhibit. In addition to the Department of Defense, the team collaborated with the National Park Service to showcase station at the National Mall in the Martin Luther King Jr. Memorial Plaza.

At each stop, CASIS works with industry to develop investigations that companies could foreseeably send to the space station. One success story recently emerged. The seeds planted at a Destination Station visit in Minneapolis are now coming to fruition with Target’s ISS Cotton Sustainability Challenge. Target is asking researchers to propose new experiments centering around cotton sustainability.

“Target is not giving the public a problem to solve, but they are giving the public an opportunity to give a problem they believe can be solved on ISS,” said Pete Hasbrook, associate program scientist for ISS.

Hasbrook indicates that a potential investigation could look into how remote sensing can improve the lives of people impacted by cotton production. He is enthusiastic about this challenge because it lets the public be included in generating thought-provoking studies for space research.

“Had it not been for Destination Station, collaborations like this with Target likely never would have been formed,” O’Neill said. “[It] provides another success story for CASIS and NASA to use as a case study in future company meetings.”

Destination Station Lead Crawford Jones notes that the outreach campaign benefits the community by inspiring the general public and showcasing that NASA is conducting meaningful and impactful research in space. Much like a traveling rock band, there are many parts of Destination Station that bring harmony to the world of science. Each stop has generated new ideas for research in space that will ultimately benefit humankind. Moreover, the orbiting laboratory allows NASA to prepare for exploration to Mars and other deep space missions through around-the-clock science and technology studies.

Destination Station is still rolling to conferences and cities nationwide. You can catch the DTE in Houston next at SpaceCom in December. Connecting the public to space research is an ongoing effort. Therefore, unlike a rock band, Destination Station’s tour will not be ending soon.

For more information about the International Space Station, visit: http://www.nasa.gov/iss
For more information about Destination Station, visit: http://www.nasa.gov/destinationstation
For more information on CASIS, visit: https://www.iss-casis.org/
On Aug. 21 around 1 p.m., there was a peculiar sight to behold at NASA’s Johnson Space Center. Most people were standing outside—an anomaly, especially in the Houston heat. And, many were congregated in groups, wearing ultra-cool glasses, their eyes trained on the sun for an astronomical experience that will not happen again until 2024.

**Hopefully, you didn’t miss it ...**

It was all for the total solar eclipse, of course, featuring our #1 star. The event was not only popular at NASA, but with Americans from coast to coast. For the Johnson team, this celestial show was one that could not be missed.

All photos: NASA/ Allison Bills and Bill Stafford

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**NASA’s new astronaut recruits report for duty**

**ON AUG. 21,** in the midst of the sun and moon’s breathtaking solar eclipse display for America, the new astronaut class officially sworn in, kicking off a two-year period of initial training. The training focuses on International Space Station systems, robotic operations, T-38 jet operations and the Russian language. In addition to these skills, the astronaut candidates perfect expeditionary skills such as leadership, followership, team care and communication through activities like survival training and geology treks. They also learn about NASA’s work in other areas, including aeronautics and research. At the conclusion of their training, they will be eligible to be assigned to a spaceflight mission and given technical duties within the Astronaut Office at NASA’s Johnson Space Center. For more on the new astronauts, visit: http://www.nasa.gov/2017astronauts
Loral O’Hara: From intern to astronaut

THOUSANDS OF PEOPLE ACROSS THE UNITED STATES dream of being an astronaut. How do we know? In the 2015 astronaut candidate application period, more than 18,300 individuals applied. This doesn’t take into account the multitudes of students now planning their own paths toward pursuing the only literal “out-of-this-world” career. At one time, Loral O’Hara from Sugar Land, Texas, was one of those students. Now, she’s one of the 12 new astronaut candidates in the class of 2017.

O’Hara’s NASA journey began long before she was selected as an astronaut candidate. She grew up in close proximity to NASA’s Johnson Space Center in Houston, and field trips and family visits to the facilities were common. Her second-grade class even grew tomato plants from seeds that had been flown on the space shuttle. As a child, O’Hara was intrigued by anything that flew—birds, planes or rockets—and dreamed someday she would fly, too.

NASA remained ever present in O’Hara’s life. In high school, she continued to visit Johnson to watch space shuttle mission debriefs, and her experiences inspired her to study aerospace engineering at the University of Kansas in Lawrence. Throughout her college years, O’Hara worked with the Space Grant Consortium, then was a team lead in NASA’s KC-135 Reduced Gravity Student Flight Opportunities Program. This program, conducted at Johnson, allowed students to propose, design, create, fly and test an experiment in a reduced-gravity environment—a unique environment she someday will experience again as an astronaut.

In summer 2003, O’Hara found herself at NASA’s Jet Propulsion Laboratory (JPL) in Pasadena, California, for an internship—an agency-wide student program providing students the opportunity to work with a NASA mentor. During her time at JPL, she worked within the Flight Hardware Logistics Program, salvaging and cataloguing residual flight hardware.

In summer 2004, O’Hara attended the NASA Academy at NASA’s Goddard Space Flight Center in Greenbelt, Maryland. The NASA Academy was a 10-week, residential summer program in which students contributed to challenging NASA research and development projects alongside NASA mentors. At Goddard, Loral worked with mentor Dr. Eric H. Cardiff on experimental apparatus and procedures used to test colloidal thrusters.

“Loral is an amazing engineer, and she’s also one of the nicest people I know,” Cardiff said. “She started out very small, working with me on a Micro-Electro-Mechanical System colloidal thruster, and is now literally on to much bigger things.”

Cardiff has high expectations of what his former mentee will accomplish during her time in the astronaut corps. “Loral has been dedicated to the goal of becoming an astronaut for a long time,” Cardiff said. “I [hope] to see her on a future mission to Mars.”

After earning her bachelor’s degree in aerospace engineering from the University of Kansas, O’Hara worked as a project engineer at Rocketplane Limited in Oklahoma City before enrolling at Purdue University in West Lafayette, Indiana, to complete her master’s in aeronautics and astronautics.

She then went to work at Woods Hole Oceanographic Institution (WHOI), where she contributed to a major upgrade of the human-occupied Alvin submarine from 2009 to 2013. Since then, she has been contributing to a variety of engineering projects within WHOI, as well as working as a sea-going mechanical technician and data processor with the ROV Jason Operations Group. She also has worked as a contract engineer for Stone Aerospace in Austin, Texas, since 2015.

O’Hara said her love for working in extreme environments and with a talented group of people solidified her dreams of being an astronaut.

“I started applying once I was old enough—actually, before I was old enough,” O’Hara said. “The first time I applied, I didn’t meet the basic qualifications.”

But as the old adage goes, the third time’s the charm: O’Hara applied again in 2015. She was contacted for an interview and, approximately a year-and-a-half after applying, received the phone call saying she had been selected as an astronaut candidate.

If she could go back in time, O’Hara said she would tell her younger self to enjoy the opportunities and never stop looking for new ones.

“I was pretty fortunate to get to do a lot of different things,” O’Hara said. “Enjoy the whole journey of growing up, figuring out what it is that you like to do, and exploring all different kinds of things.”

It’s easy to see how her experiences in NASA education programs paved the way for her success as an engineer. This August, O’Hara reported to Johnson for a two-year training stint that includes learning how to speak Russian, perform a spacewalk, maintain and repair the International Space Station and more—all skills critical to a NASA astronaut. Someday, she’ll take her expertise to space, her career reaching new heights inspired by the many NASA experiences of her youth.
Johnson was fortunate for the opportunity to thank more than 60 visiting law enforcement officers from eight different departments, which came to Houston’s aid from as far as Mobile, Alabama, in Harvey’s devastating wake. We wish they would not have had to make the trip in the first place—but boy were we glad they came.

“The police officers were extremely excited about their tour of NASA,” said Ronald Lee, who had orchestrated the visit through his existing partnership with the City of Houston Police Department. “They were thanking us when they were the ones who deserved our gratitude.”

Chief Flight Director Norman Knight was among the Johnson leaders who welcomed the first responders, showing them around the historic and now current mission control.

“Law enforcement provides the umbrella of protection that enables the freedoms we enjoy every day,” Knight said. “We are thankful for their service, sacrifice and, especially, for the outpouring of support and protection from all law enforcement agencies throughout Texas with the Harvey recovery efforts.”

It was a small thing, but it wasn’t the only thing. And in the echo chamber of a crippled, but never conquered city, all those small things and big things added up, resulting in an even stronger family bond. That family is much larger than it ever was before, and we have Harvey to thank for that. But, rest assured, we won’t.

Still need assistance after Harvey, or know someone who does?
Click for resources:
http://jscpeople.jsc.nasa.gov/relief.cfm

Share your gratitude
This article is just a small sampling of the amazing efforts exhibited during the storm and in the aftermath. We know we have missed many other exceptional stories, which have been hard to gather because, as a rule, the Johnson team is a humble bunch. Do you know of someone, or many “someones,” who deserve recognition or a thank you for their kindness and help during or after Harvey? Use us as an avenue to express your gratitude. Here’s how.

Submit your story (limit 300 words) saying who or what team deserves the praise and why. Let us also know your name, organization code, job title and company. Send the shout-outs via email to jsc-roundup@mail.nasa.gov by close of business Tuesday, Oct. 17. Your story could be featured on the JSC Features site (https://jscfeatures.jsc.nasa.gov/) in October.