Featured Stories

This is the first image Perseverance sent back after touching down on Mars on Feb. 18, 2021. The view, from one of Perseverance's Hazard Cameras, is partially obscured by a dust cover. Image Credit: NASA/JPL-Caltech

Perseverance Lands on Mars!

By Taylor Hill

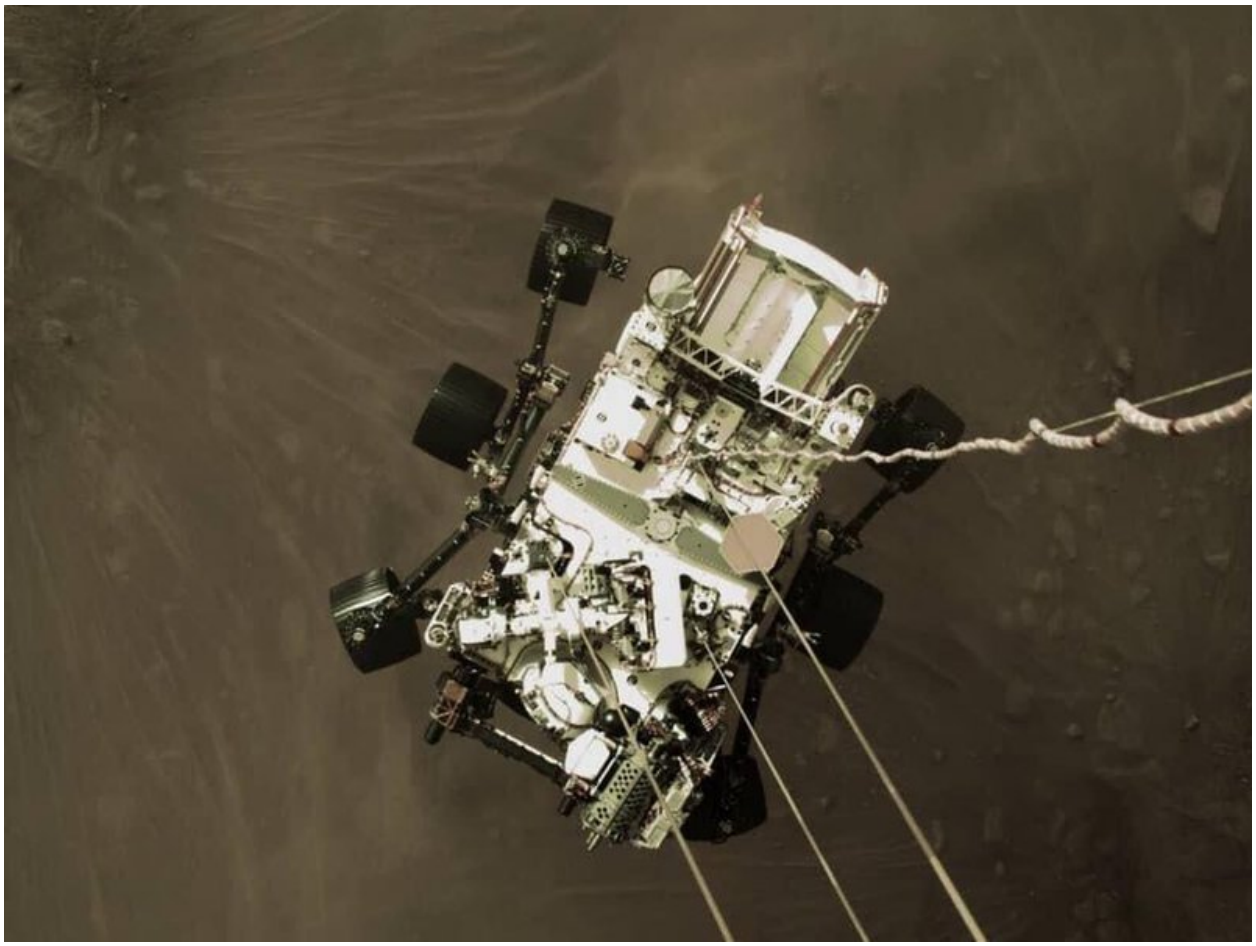
It's confirmed: Jezero Crater will be the proving ground for the Perseverance rover to further our search for ancient Martian life.

After seven minutes screaming through the Martian atmosphere, the Perseverance rover and its helicopter stowaway Ingenuity touched down safely on Mars. Perseverance mission commentator and guidance, navigation, and controls operations Lead Swati Mohan made the call at 12:55 p.m.; "Touchdown confirmed, Perseverance safely on the surface of Mars, ready to begin seeking the signs of past life."

The first image taken by the rover's engineering camera was beamed back a mere two minutes later, providing visual evidence that the rover was truly safe on Mars' rocky red soil.

At JPL, select members of the Mars 2020 team, JPL Director Mike Watkins, NASA Acting Administrator Steve Jurczyk, NASA Associate Administrator for the Science Mission Directorate Thomas Zurbuchen, and NASA Science Mission Directorate's Planetary Science Division Director Lori Glaze cheered upon touchdown from the socially-distanced Mission Support Area (MSA) in Building 230, while a majority of the Mars 2020 team and the Lab watched a livestream from their homes—a markedly different landing day experience compared to past missions due to Covid safety precautions. At the time of landing, more than 2,600 JPLers were watching the Zoom livestream, while more than 2.2 million members of the public from around the world watched the NASA.gov Youtube livestream of the landing.

"What an amazing day to have Perseverance join Curiosity on Mars, what a credit to the team," said Jurczyk. "To work through all of the adversity and all of the challenges that go with landing a rover on Mars, plus all of the changes of Covid, it's just an amazing accomplishment."



This is a high-resolution still image, part of a video taken by several cameras as NASA's Perseverance rover touched down on Mars. A camera aboard the descent stage captured this shot. Image Credit: NASA/JPL-Caltech

After a quick celebratory cheer with team members, Watkins explained Perseverance's unique position in the pantheon of JPL rover missions by first conducting its own scientific exploration at Jezero Crater, and as the first step in Mars Sample Return missions.

"Landing on Mars is always an incredibly difficult task and we are proud to continue building on our past success," Watkins said. "But, while Perseverance advances that success, this rover is also blazing its own path and daring new challenges in the surface mission. We built the rover not just to land but to find and collect the best scientific samples for return to Earth, and its incredibly complex sampling system and autonomy not only enable that mission, they set the stage for future robotic and crewed missions."

JPL Director Michael Watkins, left, talks with Director of NASA's Science Mission Directorate's Planetary Science Division, Lori Glaze, in Mission Control. Image Credit: NASA/Bill Ingalls

Early on Thursday morning before the touchdown commotion, Perseverance Flight Director Magdy Bareh placed the final marble from the Perseverance Mars rover Earth launch jar to the Mars landing jar in a conference room of the Mission Support Area (MSA). The Perseverance Mars rover team has been moving one marble a day since launch from jar to jar.

Perseverance Flight Director Magdy Bareh Image Credit: NASA/Bill Ingalls

The Mars EDL Team lined up for a group photo early Thursday morning with their individually packaged lucky peanuts in hand.

EDL Team Group Photo, Feb. 18. Image Credit: PhotoLab/Ryan Lannom

Throughout the day, JPLers were active on Slack, posting pics of their at-home preparations for watching EDL, including grabbing a special “Mars Doughnut” from Krispy Kreme for a morning treat. Jamie Holguin (2831) sent in an image of her home setup with the following caption: "Started my morning getting to Krispy Kreme at 5:30 a.m. to be back and start work at 6 a.m. Happy landing Percy and Ingenuity!" See the full collection of photos JPLers submitted celebrating landing day.

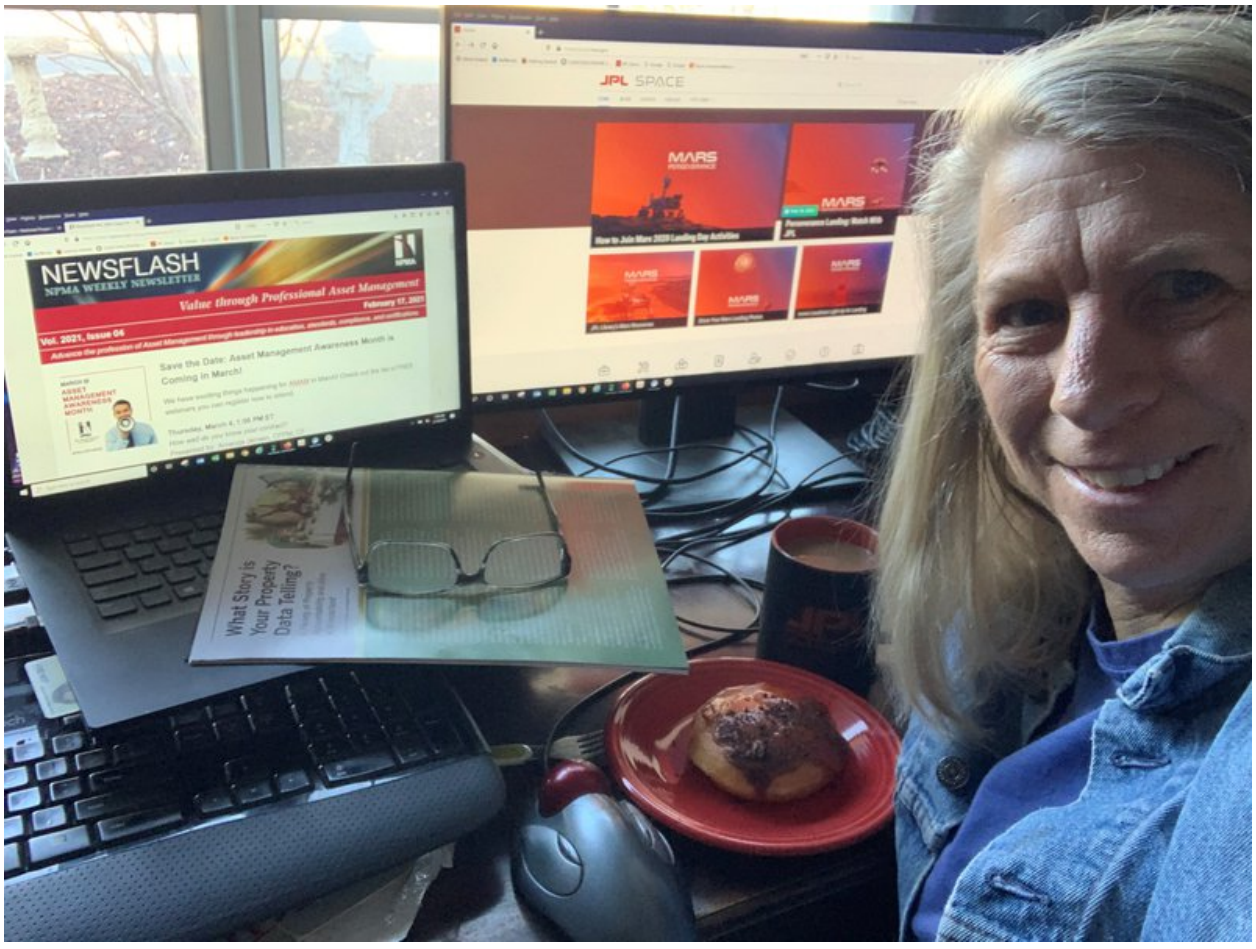
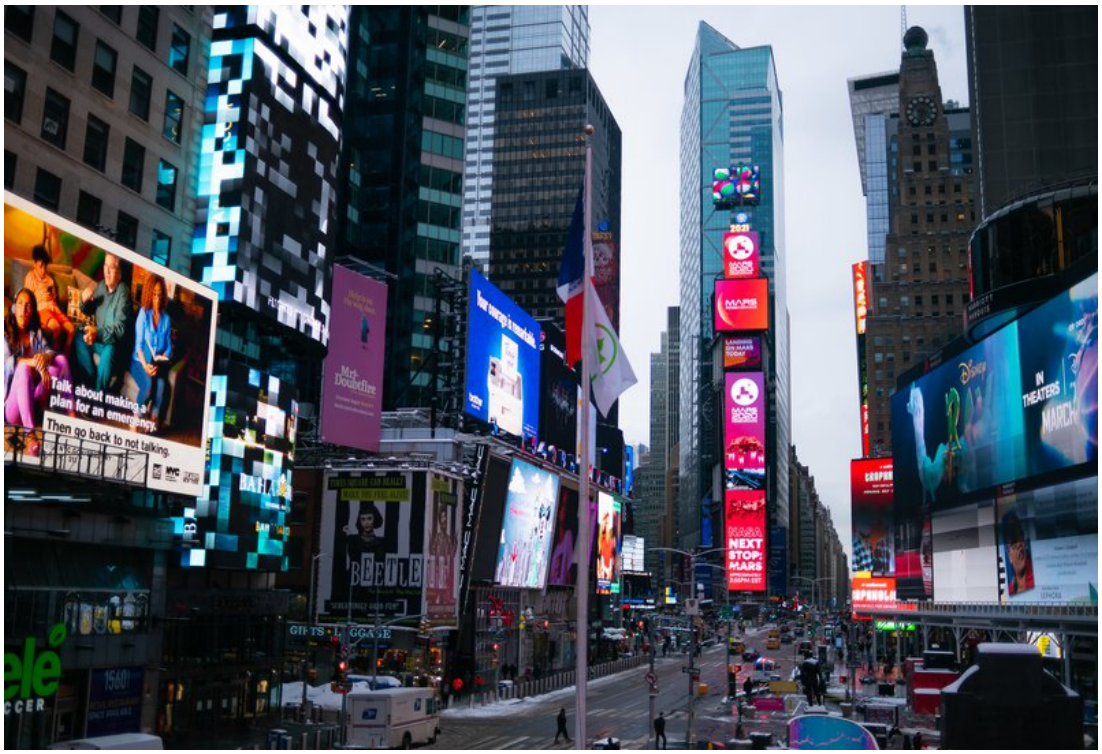


Image Credit: Courtesy of Jamie Holguin

Around the world, iconic locations in cities from Los Angeles to London lit up in red to celebrate the landing.

The Empire State Building is illuminated in red to celebrate the landing on Mars of NASA's Perseverance rover. Image Credit: NASA/Emma Howells



The One Times Square video board on Feb. 18 Image Credit: NASA/Emma Howells

Los Angeles City Hall building lit up red on Feb. 18.

For more photos of landing day, please visit the Mars 2020 public Flickr photo album.

Q&A With Leslie Livesay, Now at the Helm of Flight Projects and Mission Success

By Jane Platt

When Leslie Livesay first came to JPL to interview in her senior year of college, she knew immediately that this was “her place.” Thirty-five years and many JPL missions later, she is beginning a new job overseeing implementation and operations of all our missions that explore “our place” in the solar system and the universe.

Livesay begins the new role as Associate Director for Flight Projects and Mission Success on March 1 — succeeding Richard Cook as he takes on management of Mars Sample Return. She is being succeeded by Keyur Patel as Director for Astronomy and Physics. Details in official announcement.

Livesay’s experience covers multiple areas at JPL. In addition to leading as Director for Astronomy and Physics, she also served as project manager for the Kepler space telescope and as Director for Engineering and Science.

We sat down with her (virtually) to get her thoughts as she begins her new job, on her role as the first woman to hold this position, and much more.

About the new job itself:

What does your new job entail and how does it relate to other Executive Council positions?

There are two associate laboratory director positions that report to JPL Director Mike Watkins, one for strategy and formulation and one for flight projects and mission success. My role as Associate Laboratory Director for Flight Projects and Mission Success has overall responsibility for how we implement flight projects at JPL in addition to assessing their status. The Directors for Planetary, Earth Science, and Astronomy and Physics are responsible for strategy, formulation, and implementation of missions in their portfolios. My job is to ensure that as an institution, the overall portfolio of missions is balanced in terms of cost, schedule, and technical risk. For checks and balances, part of my responsibility

involves spotting early signs that a mission may have issues, so we can work together to correct the course. In this role, I also work closely with the Science Mission Directorate at NASA Headquarters, other NASA Centers and Industry.

In addition to my role in our flight projects, I am part of Mike's leadership team, focused on advancing our strategic objectives in leadership development, diversity, equity and inclusion, business operations, and governance.

What are your priorities or big projects and initiatives in the new role?

Over the next few months, I intend to spend time observing how things are going and talking to a number of people before I decide on new initiatives. I know there is work to be done in small mission implementation. In the last decade, JPL has had one or two flagship missions—large, big-budget missions, several mid-size missions, and a few small missions in development at any one time. Today I see the number of smaller missions increasing. The smaller missions have smaller budgets and therefore smaller teams, resulting in the need for broader, more experienced personnel. This is a challenge for us.

What are you looking forward to continuing and/or modifying?

First, I'd like to say that Richard Cook has done an excellent job in this role…his are big shoes to fill. I will continue Richard's focus on leadership development and project cost and schedule performance improvement.

You're coming in right on the heels of the successful Perseverance Mars landing. Any comments about that milestone?

It is nice to be coming in at a time when our largest technical endeavor was just completed successfully. I am so impressed with our Mars 2020 team and everyone who made it possible.

What are the biggest challenges ahead?

I see three right in front of us: The safe transition back to a post-pandemic Laboratory, delivering on mission success within our cost and schedule commitments, and making the right decisions about what to build in house and what to contract out, across all our flight projects, to ensure we can successfully execute the work.

What do you think will be different about JPL post-pandemic, given the tremendous upheaval this past year in so many ways?

Dave Gallagher is leading a team to look at this specifically. It's pretty clear that a Covid-free world is not going to be with us anytime soon. I think many in management were leery of teleworking, so this has been a real eye-opener, because in true JPL fashion, people have adapted and done their work despite the challenges. We've learned from the experience that we can be more flexible.

What do you like about JPL most?

No question, it is the people. There is no place on Earth that has the depth and breadth of technical expertise and the ability and drive to do the amazing things we do. Also, the sense of family and community. Work is very important, but families come first.

About the JPL culture:

Employee surveys have shown that JPLers are proud of the work we do. How can JPL continue to build pride among employees?

That pride comes from being part of the team. While several dozen engineers and managers were in the control room during the successful Perseverance landing, hundreds of employees played critical roles behind the scenes. Looking back on my career, my most memorable experiences came from being part of a team, with a shared purpose and sense that we were in this together, even when things were not going as planned. We need to ensure that all of our employees feel valued in that way. This includes not just engineers and project managers, it's also our administrative staff, security, fabrication services, facilities….really everyone at JPL has a part to play. The Lab needs to continually work on creating an environment in which every individual feels that common sense of purpose and ownership of their role in making our missions successful.

Because JPL dares mighty things, there are enormous successes and inevitable disappointments. Any perspective on that or advice on how to deal with it?

I think one of the things that defines JPL is our willingness to succeed or fail in a very visible way. If we fail, it's important to learn from our mistakes and know we did our best.

<u>As the first woman in this particular job:</u>

Explain the significance of this milestone and what it means to you, and what it may mean to other women at JPL and to the Lab overall.

This is a job I aspired to have. My career experience in line, project and program management gives me a unique perspective on JPL, and I plan to bring that to this role. Because this is the first time a woman has held this position, I hope this signals an opportunity for others to follow. When I came to JPL in 1985, technical women were very much a minority, but I think less of a minority than the generation before mine. The demographics are improving, but more is needed. I would like to see our leadership demographics reflect our demographics overall, with a plan for increasing both. I know Mike Watkins and the Laboratory leadership feel strongly about this same objective.

Diversity of gender—what does it provide?

It is really about diversity on all fronts. Diversity brings different life experiences to the table, it changes the discussion, brings a new perspective, and creates a more inclusive environment.

How can women help pave the way for others? How can men help?

We can mentor, advocate and support our colleagues. We can manage the conversation so that all voices are heard. To that end we can set an expectation for how meetings will be conducted to be inclusive, how work will be assigned and evaluated, and how performance will be assessed. If I look back on my career, I realize I could have done more, and I plan to do more. Men can do that, too.

March 8 is International Women's Day. Any advice to women in particular, and to all JPLers who would like to advance and perhaps follow a similar career path to yours?

Seek out mentors and advocates, don't be afraid to ask questions, stretch yourself and most importantly trust yourself. If you see a critical gap on a team that you can fill, seize the opportunity and close the gap. Don't be intimidated by setbacks.

<u>About you:</u>

What life path brought you to JPL?

I was born in a suburb of Chicago, but moved around, as my father was in the Air Force. I lived in Germany for six years and ended up in the central coast of California. I knew about JPL because of Voyager. At Cal

Poly San Luis Obispo, I met with a JPL recruiter and was invited to interview on Lab, and after actually going to JPL, I knew it was really “my place” – where I wanted to be.

Did you have a mentor? What do you think is the importance of mentoring?

I have had many mentors and I have been a mentor. I learned so much from both experiences. No two career paths are the same. My advice is to reach out to someone whose career path or current position is one you would like to emulate. Don’t be shy, most JPLers want to help.

You once said you try to do the things you’re good at and find the best people to do the things in which you don’t excel. Explain why that’s important.

We bring strengths and weaknesses to every role we undertake. Few people are good at everything. You need enough self-awareness to know your weaknesses and the confidence to surround yourself with exceptional talent. Everything we do at JPL is a team sport. For example, I don't need to be the smartest person in the room, as long as I have other smart people in the room. And none of us should be intimidated that we don't have all the answers.

What do you do in your free time?

I am an avid hiker and a dog person. It is so nice to have access to the trails at JPL and at home, and I have been on them with my dogs for decades. I am happy I was able to spend the last year with them in my work-from-home office. I have been hiking in Europe the past few years and planned to hike in Sicily in 2020. I will make it there in 2021!

One final non-work, non-technical question: We've probably all watched way too much TV this past year. Any recommendations?

The Queen’s Gambit. After watching it I, like many others, then researched the real history of female grandmasters and world champions.

Full bio of Leslie Livesay available here.

Rising Through the Ranks As a Black Engineer

By Celeste Hoang

Joseph Hunt was 13 years old when he watched the Moon landing live on his family's black-and-white TV set back in 1969, mesmerized by humanity's first steps on the lunar surface.

But he never imagined he would grow up and work in space exploration. Instead, Hunt studied electronic technology and engineering at Virginia State University and spent his post-college years working in military defense projects that took him from Northern Virginia to Massachusetts, South Carolina to Florida, and across the country to California. He worked on navigation systems for missiles and submarines, flight simulators for training Navy pilots, and even taught himself how to fly naval planes.

By the '90s, Hunt had made his way to JPL, lured by the opportunity to apply his skills to the quest for greater understanding of the solar system and the universe. Over his three decades at the Lab, he has worked on a variety of missions, including TOPEX/Poseidon and Cassini, and has earned three NASA medals along the way.

Now, at age 64, Hunt carries the personal and professional lessons learned throughout life with grace, humor, and humility. In honor of Black History Month, we sat down (virtually) with Hunt, learning how he rose through the ranks of JPL as a young Black engineer in the '90s to become the project manager for both Spitzer and NEOWISE today.

You had an early love for technology and engineering. What sparked your interest?

I was inspired as a child from watching TV and listening to the radio. I was always interested in how those products actually functioned. 'How do those people appear on the TV? How did the sound come out of that box?' When I became a young teenager, I built a radio. I was so excited when I went to turn the thing on, and it actually worked. RadioShack used to sell these project kits and I used to be crazy about them. As a result, I started fooling around with TVs and became the neighborhood TV repair kid.

On designing flight simulators for the Navy and teaching himself how to fly naval planes:

After college, I started designing mobile communications modules for the Army. From there, I went to work on flight simulators. I learned that when they monitored Navy pilots after the Vietnam War, one of the scariest things for the pilots to do was land a plane at night on an aircraft carrier. My engineering partner at the time [on that job] was a bodybuilder, and he couldn't fit into the plane's cockpit, but I could. So, I performed the pilot functions and did the engineering testing for the avionics of the flight simulator. I never learned formally how to fly—I just knew friends with planes and worked with flight simulators. I guess if you practice anything enough, you can eventually do it. The Navy pilots were impressed with my flying *(laughs)*.

You were down at Cape Canaveral's Naval facility and witnessed the Columbia Space Shuttle being built and then launched in 1981. What was that like?

I was totally intrigued by Columbia. I was working at Cape Canaveral and would frequently visit Kennedy Space Center for lunch and watch them build the shuttle. I had a friend and coworker who had a Cessna and one day, we flew across restricted air space while the Columbia shuttle was sitting on the pad. I definitely would not do that today—I would get shot down (laughs). I saw the launch in person and it was the most patriotic I've ever felt in my life. You're an American citizen and this is America at its best as you're watching this thing take off. It was breathtaking.

How did you hear about JPL and what made you want to work there?

The first time I heard about the JPL was in the '90s, when I was working at Northrop Electronics in Hawthorne, California. JPL was having a job fair, so I came over [to the Lab] to check it out and they were talking about Mars Orbiter, TOPEX/Poseidon, and how they were ramping up those missions. For me, working in the defense industry for so many years, I was ready for a career change. Once I was introduced to JPL and all of the engineering and scientific things they were doing, I got really excited about space exploration. I wanted to stop building weapons. It was a chance to change from a defense perspective to going out and doing something that provided more science and technological contributions to the general community.

What challenges did you face early on in your career as a Black engineer?

One of the first things I noticed about JPL when I came here [in the '90s] was the ethnic makeup of the workforce. Sometimes, it felt like there was no social outlet. There was no one that I could consult for their perspective on the environment, and there was very little insight into the culture. It was very interesting, too, because there was no formal mentoring at the time, at least that I was aware of. [Inclusion] got slowly better over the years, though. I just happened to be in that generation of change.

On building his own network of mentors:

I always had this attitude for myself that I built my own mentorship population. The younger folk today call that networking. I built my own networking by being approachable and maintaining a receptive personality; it's about being open. Early on, the people in my leadership network were mostly white men because they were the dominant leadership of JPL. And that changed as years went by. As that changed, my network changed. But I always had a diverse set of peers that were honest and open for the most part.

What's been a particularly valuable piece of advice you learned from your mentors?

I learned a lot about telecommunications from one of the lead telecom engineers. I also learned a lot about engineering best practices and lessons learned, just from talking to people with mission operation experience. When someone is sharing their story that happened on another mission, you listen. And as a result of listening to them, when you are faced with that same scenario-slash-challenge, you take a different approach. You take some of the assumptions out of the equations because someone else has experienced those same conditions before you.

On being the project manager for Spitzer and NEOWISE at the same time:

I spent 19 years on the Spitzer mission. It will always rank as one of NASA's greatest observatories for studying the cosmos, and I can't say enough about the people that contributed to such a successful mission. Picking up the NEOWISE project, it was already a well-established mission with seasoned personnel in key roles, meeting the science objectives. I think the Comet NEOWISE was a welcoming gift. All I had to do was take over from the previous project manager, who had done a fantastic job, and maintain the continuity of operations.

What was that transition like for you?

I had to go from a mission I knew lots about, to a new mission with a whole new science objective and mission operation design. I had to learn about the mission, the organization, people's names, and be able to join the project in a way of leading by trust. This all had to be accomplished working remotely during the pandemic, too. I had to establish with the team that I understood the mission science objective, the spacecraft, and the ground system, to the point that they embraced me as the new leader. That way, there's no controversy because there was early acknowledgement in understanding their roles and their jobs. It wasn't like a leader coming in and changing everything the way they want it. It didn't require change, just sustainment.

You also survived Non-Hodgkin's lymphoma in 2004. What was it like returning to Lab after your time off for treatment?

I just tell myself I'm a survivor. I'm very determined. I set goals and I'm very determined to achieve my goals. My coworkers at JPL were very supportive. When I came back, my desk was just like I left it. I just went right back to work.

I was told by someone on Cassini, 'When things become difficult sometimes, they're tests. Don't take it as an insult. You're being challenged because there's something better for you.'

On facing racism throughout his life:

I was sheltered from [racism] by my parents when I was a kid, but once I started high school and started exploring places and venturing out, that's when I was introduced to different situations. I've had a policeman pull me over with a gun to my window. I've been pulled over and told to pay in cash on the spot for a ticket. I had a Porsche 911 in the '90s and got rid of that car because I was getting pulled over by the police all the time. Back then, the thought was, 'He must have stolen this car.' The truth is, I was probably being racially profiled. Since I got rid of that car, I haven't gotten a ticket since.

On facing microaggressions:

Sometimes people say things at work and elsewhere and they really don't know how it's impacting you. On my insides, I'm irritated. But I can't express that, because it's like, 'I personally do like you. I've liked you for years, but now do I doubt that?' I think it's important, though, because when I am experiencing this, people reveal what they are thinking, and I see society still has some problems. It tells me how far away we still are. Sometimes you think everything has changed [for the better], and then you get those subtle reminders of the work to be done.

How do you deal with these challenges in your life and career?

When you're growing in life, there are going to be obstacles in your way. I was told by someone on Cassini, 'When things become difficult sometimes, they're tests. Don't take it as an insult. You're being challenged because there's something better for you.' It was the first time someone had said something to me that made those complicated situations feel like they were part of me growing. These are experiences that

make you wiser. I wonder today, did that apply to everyone or did this person understand my challenges and wanted to give me words of encouragement? I really appreciated this person.

You also have to stay focused and not react to each scenario. You have to believe in your journey and thank God almighty there's a higher power of faith that looks over us. I stay focused and just continue the journey.

Career advice for young Black JPLers starting out:

I would say the Lab offers a very diverse portfolio of job disciplines, which provides you with a lot of growth opportunities. The Lab is a fixed workforce, so there's a strong likelihood of your coming back into association with people you've worked with in the past in different roles and responsibilities. So, if you're faced with a challenge, and you feel that it's personal, try to approach the person and talk to them. You have to be careful because that person might be your next supervisor, making your next recommendation, and sometimes we don't know what's driving the other person. Keep your relationships strong, even if they're tough, in life.

Why is it important for you to be part of B.E.S.T., the Lab's Employee Resource Group for Black employees?

B.E.S.T. has established a great communication forum with the JPL leadership. They also provide a platform where new Blacks and African Americans can meet, share stories, and ask questions that can help them navigate JPL's culture. Being a more experienced JPLer, I can be a sounding board or consultant. I also feel it can be motivational for members to see and interface with someone of color that has grown through the JPL career path.

What would you like to see done within the JPL community in terms of diversity, equality, and inclusion?

I think we as people should open our minds and hearts and practice being more reasonable and sensitive about inclusion. I personally feel that the people I have encountered are all warm and caring. When I was looking for a kidney donor a couple of years ago, someone at JPL reached out and shared they were a donor. This was very uplifting and gave me hope. JPL has acknowledged the issues of diversity, equality, and inclusion, and is applying resources to better understand and address these matters. I think JPL can write policies governing the code of conduct at the workplace but this is much larger than JPL, too. Coming into the workplace or in one's local community, we all must exercise common sense and be accountable for our actions. Anything you practice, you will improve in.

This interview has been edited for length and clarity.

The First JPLers, Part 5: Aircraft Super-performance

By Erik Conway

Frank Malina, Jack Parsons, and Ed Forman returned to the Arroyo in the spring of 1940, after receiving funding from the U.S. Army Air Corps. During their period on the Caltech campus between 1937 and 1940, they had been funded by a private donation from a meteorology student named Weld Arnold, and then by a grant from the National Academy of Sciences' Committee on Air Corps Research.

That grant was offered to advance what was called "super-performance" for aircraft, using both solid and liquid propellants. Practically, this meant using rocket motors to help get heavy aircraft off the ground faster. In 1939 and early 1940, Parsons' rocket motors still routinely exploded, a problem caused by continuously increasing pressure as the motor burned. Eventually, the pressure became high enough to cause the casing to burst.

Welcome back to the Historian's Corner, where we explore the origins, mysteries, and curiosities of our Lab. I'm Erik Conway, JPL's historian, and I'll be your guide as we travel through time together.

Theodore Von Kármán, who was the director of Caltech's Guggenheim Aeronautical Laboratory, and Malina demonstrated analytically in 1940 that the solution was to maintain a constant ratio between the area of burning propellant and the area of the motor throat.

This elegant solution would produce a stable pressure in the motor chamber. But mechanically, the fix was not so simple. The powder charge tended to crack as it burned, exposing more surface area and producing pressure surges. Parsons' first solution was relatively traditional: he used a hydraulic press to pack the powder into the motor casing in thin layers. Using this method, it took about an hour to load each motor with propellant.

These solid motors powered the team's first flight tests, with an Ercoupe at March Field in Riverside in August 1941. The single-engine, low-wing Ercoupe was one of the lightest aircraft available at around 800 lbs (363 kg) empty. The jet-assisted take-off motors (JATOs) Parsons made for these tests produced 28

pounds (124 Newtons) of thrust for 12 seconds each, and they were mounted on racks on the aft fuselage. Most of their flights were made with six motors. Because it wasn't unusual for a motor to over-pressurize, the motors were designed so that the nozzle would blow out before the casing failed. This happened several times during the tests: in one ground test, the nozzle bounced off the pavement and tore a 10-inch hole in the tail. They repaired it and started testing again four days later.

Over the course of three weeks, the JPL founders performed 62 tests, on the ground and in the air, to demonstrate super-performance. They reduced runway need by nearly half in their takeoff tests. When ignited in the air, the motors raised the Ercoupe's flight speed by 56.5%. In their enthusiasm, the founders even tried to do a takeoff with 12 JATO motors but no propeller. The plane failed to lift off.

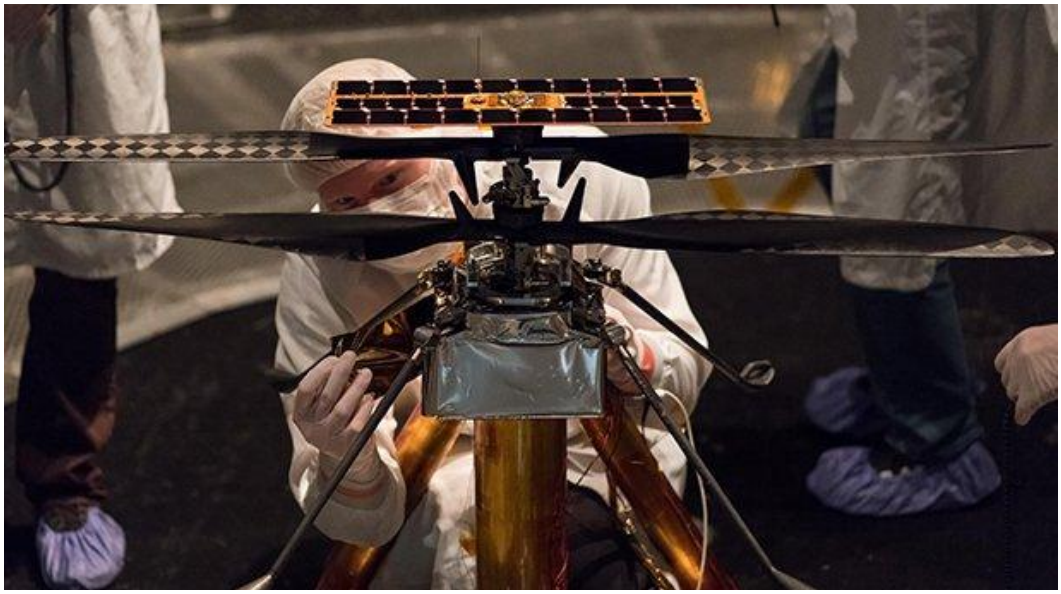
On August 20, 1941, Malina wrote home that "We have had success this week with our rocket project that exceeded even our highest expectation. Wish I could tell you more about it. Anyway, we have had a taste of what we have been striving for the past three years."

While these tests were largely successful, the enthusiasm they generated was short-lived. The motors could only be stored a few days, it turned out, before the cracking-and-exploding problem returned. That made them useless to the Army. The motors needed to be shipped around the world and stored for at least months, if not years.

Parsons' next solution fundamentally changed the way solid rockets were, and are, made. He replaced the fuel in his mixture with asphalt in early 1942. This eliminated the need for the hydraulic press. Motors could just be poured into a mold, and these motors could be stored for years. He didn't leave a record of where he got the idea from—"Greek Fire," a weapon in the ancient world, was asphalt-based, and of course we use asphalt on roads and rooftops. Either could have been the source of the idea. A few years later, JPLer Charles Bartley replaced the asphalt with a rubber-like polysulfide. Since these propellants were poured into their casings instead of being pressed, they were called castable.

The solid-fuel JATOs that the GALCIT Rocket Research Project developed were one of the two kinds of JATO they tackled. The other motors, using liquid fuels, that they developed would be much more powerful, and fly barely a half year later. We'll look at that development thread next month.

Events



Von Karman Lecture Series: Helicopters in Space

Thursday, March 11
7 to 8 p.m.

YouTube link
Ustream link

How do you fly a helicopter on Mars? It takes Ingenuity and Perseverance. During this technology demo, Farah Alibay and Tim Canham will get into the details of how these craft will manage this incredible task.

Speakers: Farah Alibay, Systems Engineer, Mars 2020; Timothy Canham, Mars Helicopter Operations Lead

Hosts: Nikki Wyrick, Public Services Office; Sarah Marcotte, Public Outreach Specialist

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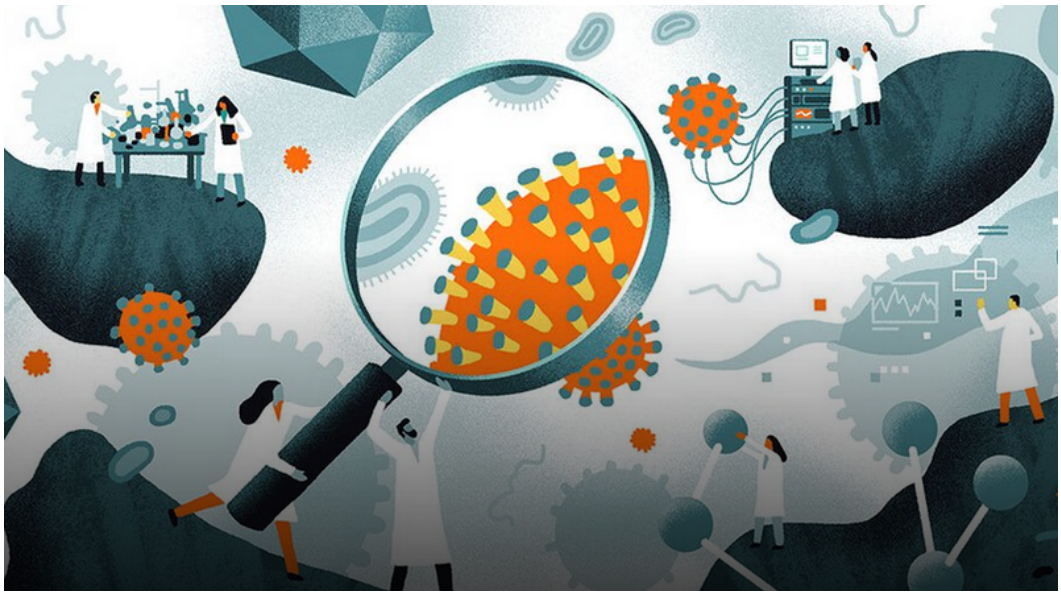


Conversations on Covid-19: Understanding Viral Transmission

Monday, March 15
11 a.m.
Register here

Join Caltech science writers as they interview scientists and engineers from across campus and at JPL about how they are tackling Covid-19, and ask your own questions.

In this webinar, three Caltech graduate students leading the Caltech COVID-19 Study—Matt Cooper, Emily Savela, and Alex Winnett—speak with science writer Emily Velasco about their work to understand how the virus is transmitted and how the data they collect could help prevent disease spread.

Hear directly from Caltech researchers about their progress and ask your own questions in this series of conversations for the Caltech community.

This series is presented by the Caltech Science Exchange, which brings expert insight to the scientific questions that define our time. The Science Exchange offers trustworthy answers, clear explanations, and fact-driven conversation on critical topics in science and technology, including Covid-19 and other viruses.

Caltech Playreaders: Shakespeare Sonnets

Tuesday, March 16
7:30 p.m.

JPLers are cordially invited to attend the one-time-only showing of the Caltech Playreaders' virtual performance of Shakespeare Sonnets.

On June 23, 1592, London theatres were closed due to the plague and the possibility of civil unrest. They were not reopened until June of 1594. Shakespeare, unable to pursue his emerging career as an actor and playwright, turned to literary art, publishing two dramatic poems, Venus and Adonis in 1593, and Lucrece in 1594, which brought him fortune and fame as a poet. Scholars think that the writing of Shakespeare's sonnets was also begun during these plague years. The sonnets were first circulated among his private friends and not published in full until 1609, well after Shakepeare's fame as a dramatist had surpassed his initial fame as a poet. For centuries these breath-taking sonnets have been the subject of scholarly scrutiny and attempts to mine clues to the poet's own life and loves. With their glorious language, dazzling imagery, and profound meditations on love, art, time, and immortality, his "sugared sonnets" still remain tantalizingly elusive in their meanings.

And so we come full circle, in the midst of our own plague year and civil unrest, to find solace and delight in sonnets begun during plague years over 400 years ago. The Caltech Playreaders will present a varied assortment of Shakespeare's sonnets as interpreted for today's world. The Zoom presentation will be broken up into two halves, with a brief pre-recorded discussion after each half. There will be a follow along program with the text of all sonnets available at production time here.

You'll see a brilliant cast of performers: Kathryn Bikle, Todd Brun, Carol Elaine Cyr, Greta Davidson, John Davidson, Barbie Insua, Phoebe Kellogg, Cara King, Douglas Smith, Diana St James, and special guest Tiffany Kim, under the direction of Ann K. Lindsey.

This performance will be virtual. Please go to this site on the date of the performance for the link to the performance.

Please note that this performance is only available at the scheduled time and will not be available afterwards.

JPL Family News

Retirees

The following JPL employees recently announced their retirements:

50+ Years:

Stanley Butman, Section 3370, 54 years

30+ Years:

Paul M. Andres, Section 398N, 32 years

Deborah A. Padilla, Section 2500, 31 years

20+ Years:

Martha D. Verdugo, Section 348F, 23 years

10+ Years:

Jamie J. Gonzales, Section 1100, 11 years

Passings

Lee Squibb, 76, passed away on February 3, 2021 at her home in Gold Hill, Oregon.

Squibb married Gael Squibb in July 1988 while both were working for the Jet Propulsion Laboratory in Washington D.C. Shortly after, he took a two-year assignment with the European Space Agency, which gave them the opportunity to live in both The Netherlands and Germany.

She brought joy to people's hearts, and loved life to the fullest.

Squibb is survived by her husband, Gael Squibb, their children Todd (Jamie) Clausen, Tim Clausen, Greg (Priscilla) Clausen and Tanya Bonnette, David (Sara) Squibb and Matt (Teresa) Squibb, 17 grandchildren and 8 great-grandchildren.

There will be a family graveside service in Jacksonville, Oregon sometime in the future.

Donations in lieu of flowers may be made in Lee's name to the Alzheimer's Association 800-272-3900 or alz.org.

Gary Lawrence Block, 70, passed away on Nov. 28, 2020 after contracting Covid-19. He was a caring father, brother, colleague, friend, and would soon have been a grandfather. Gary worked at JPL for 20 years, and his last position at JPL was a science applications software engineer for 398K – Science Data Modeling and Computing Group.

He was born to Del and Peggy Block in Gardena, California as the middle child of three brothers. Gary was a quiet child who was constantly exploring the workings of the world around him. He enjoyed taking everything apart and to (often unsuccessfully) reassemble them.

His love of tinkering with machines led him to study computer science at UCSC, Cal State Northridge, and CLU. He tried an array of jobs including work in telecommunications and started his own business before settling into his dream job at JPL.

He enjoyed living in Newbury Park with his wife, Kathy, and they welcomed twins Devan and Trina in 1989. He shared with his children his love of nature, beginning with short hikes in the local Santa Monica mountains and later overnight camping trips to his favorite national parks.

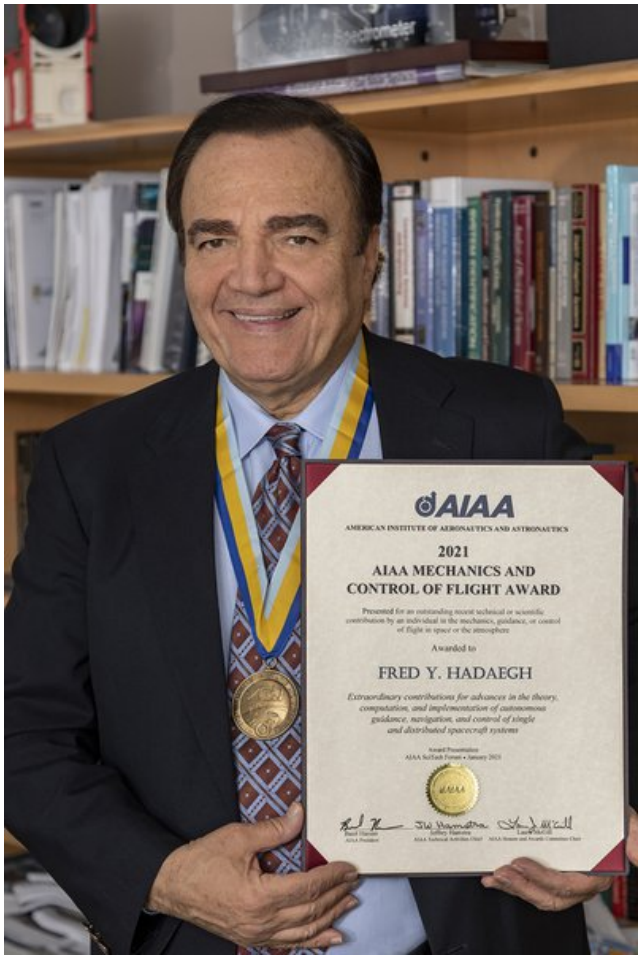
Gary later moved to Montrose, significantly shortening his commute to work. He was even known to bike on occasion. He became an active member of the church, volunteered at a local high school, and was involved in the JPL hiking and radio clubs.

During his career at JPL for almost 20 years, Gary developed a wide range of mission critical software and hardware products. To highlight a few, he developed the Mars 2020 flight software for controlling the SHERLOC imager, the mission's EDL camera system, the IOS subsystem for NASA's Laser Communications Relay Demonstration project, a hemispheric camera system for NASA's tech demo project HemiCam, a parallel computing system named Model Farm for land surface models, a visualization and testing system for the SMAP Level 1 radar products, a fault tolerant wireless avionics network for flight applications, and a C-like compiler for the DARPA's High Productivity Computing Systems Program. He was a considerate, kind, and supportive colleague at JPL. He was also a great mentor for many interns.

He is survived by his wife, Kathy; their son and daughter-in-law, Devan and Alice Block; his daughter Trina Block; and his brothers and their spouses, Woody and Ann, and Toby and Joan.

A memorial service was held to celebrate Gary's life via Zoom on Jan. 24, 2021 at 2 p.m. (Pacific Time). It was hosted by Reverend Tim Singleton from Gary's home church Mt. Olive Lutheran Church in La Crescenta, California, and was attended by over 70 people from all parts of his life.

Awards



JPL Chief Technologist Lands AIAA Award

"Believe in your vision and don't get disappointed if people don't immediately jump on the bandwagon." That's the advice of JPL Chief Technologist Fred Hadaegh for other JPLers hoping to make major inroads in technology. Hadaegh has followed that philosophy throughout his career at JPL (since 1984) and has helped the Lab become a world leader in technologies previously deemed improbable by many skeptics.

Hadaegh's "never give up" attitude led to a body of work that is now being honored by the AIAA (American Institute of Aeronautics and Astronautics), which has presented him with its 2021 Mechanics and Control of Flight Award. The award citation praises his "extraordinary contributions for advances in the theory, computation, and implementation of autonomous guidance, navigation, and control of single and distributed spacecraft systems."

The specific work covered involves Hadaegh's technical contributions and leadership in developing the principles and methodologies enabling practical use of multiple spacecraft and telescopes flying in formation, and swarms of hundreds or thousands of small spacecraft. His work has impacted how scientists detect and characterize exoplanets and improve Earth observations, among other capabilities.

"This is extremely humbling, and I'm honored to be selected for this award, which includes past recipients who are among the giants in the field," Hadaegh said. "The award goes to me, but also reflects the work of JPL and collaborators from academia and industry."

The AIAA presented the award to Hadaegh at a virtual ceremony on Jan. 20. A formal reception is being planned for August 2021. This particular award is administered jointly by three AIAA technical committees; Atmospheric Flight Mechanics, Astrodynamics, and Guidance, Navigation and Control.

The organization describes its work as ensuring that aerospace professionals are recognized and celebrated for their achievements, innovations, and discoveries that make the world safer, more connected, more accessible, and more prosperous.

Hadaegh was appointed JPL's Chief Technologist in 2016. Before that, he served as Associate Chief Technologist. He is a JPL Fellow, Senior Research Scientist, and Principal Engineer.

For two decades, he supervised the Guidance and Control (G&C) Analysis Group, which leads research in guidance, estimation, and control theory and develops algorithms and software for planetary science and astrophysics missions. He also led development of G&C technologies for spacecraft formation flying, autonomous rendezvous, and docking for NASA missions and Department of Defense programs.

Hadaegh is a Fellow of the AIAA and of the IEEE (Institute of Electronics and Electrical Engineers). His numerous awards include NASA's Exceptional Service and Exceptional Achievement Medals, The World Automation Congress Lifetime Achievement Award, and a JPL Award of Excellence.

International Optics/Photonics Society Honors Shouleh Nikzad

SPIE, the international society for optics and photonics, has selected JPL's Shouleh Nikzad for its 2021 SPIE Aden and Marjorie Meinel Technology Achievement Award.

This award recognizes outstanding technical accomplishment in optics, electro-optics, photonic engineering, or imaging. It honors recipients who have contributed significantly to the advancement of one or more of these areas, including demonstration or application.

Nikzad's citation reads specifically: "In recognition of your pioneering and sustained contributions to the development of ultraviolet instrument technologies, especially imagers for space exploration and extension of their use in terrestrial applications."

Nikzad is a JPL Fellow, Senior Research Scientist, and Technical Group Supervisor for Advanced Detectors, Systems, and Nanoscience.

The SPIE award was presented to Nikzad virtually on Dec. 14, 2020 during the first plenary session of the SPIE's Astronomical Telescopes and Instrumentation. A physical presentation is planned for the SPIE Optics and Photonics event in August 2021 in San Diego.

Nikzad says of the honor, "I am excited and humbled in receiving this recognition from SPIE for doing the work that I immensely enjoy while contributing to JPL and NASA's goals and working with an amazing team!"

Nikzad explains that she and her team work on "ultraviolet detector technology, filters, and coatings technology starting from nanoscale engineering of materials structure to achieve high performance devices and instruments."

More information is in this SPIE article related to the award:
https://spie.org/news/shouleh-nikzad-2021-spie-aden-and-marjorie-meinel-technology-achievement-award?SSO=1

Additional information on Nikzad's work is at the JPL Microdevices Lab website:
https://microdevices.jpl.nasa.gov/capabilities/advanced-detectors/

Gentry Lee Elected to National Academy of Engineering

The National Academy of Engineering has elected Gentry Lee as a member of its organization.

Gentry Lee has been involved with almost all of JPL's planetary missions for the last 50 years. In particular, after playing a major role on the Viking mission that landed on Mars in 1976, he has chaired the entry, descent, and landing review boards for all the Mars missions since 2000, including Spirit, Opportunity, Phoenix, Curiosity, InSight, and most recently, Perseverance.

"Being selected to the National Academy of Engineering is the pinnacle of recognition for someone who is an engineer. I'm deeply honored and thrilled," Lee said. "My recognition would not have been possible without the work of hundreds of colleagues, whose contributions are also honored by my selection."

Lee is the guy who challenges the mission teams to check all the boxes that will help ensure mission success. As he puts it, "If you cannot prove there is not a problem, you must assume it is a problem."

He will be formally inducted into the Academy at a ceremony in October.

The organization honors engineers for outstanding contributions to "engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature" and to "the pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education."

More information is at:

https://www.nae.edu/248499/National-Academy-of-Engineering-Elects-106-Members-and-23-International-Members.