

# Celebrating 40 years of Voyager wonders

Mission veterans recall the dedication of the team; rock concert looks back four decades

By Mark Whalen

JPL's iconic explorers, the twin Voyagers, continue on their journey at the edge of the solar system started 40 years ago. JPL celebrated Voyager in late August with a series of events befitting one of the most accomplished and revered robotic space missions of all time.

On Friday, Aug. 25, Lab Director Michael Watkins welcomed JPLers, Voyager veterans and political representatives to a commemoration on the Mall.

Voyager has been not only a great voyage of exploration, but one of the greatest engineering feats of all time, Watkins noted. "I hope all of us here today feel a part of the Voyager project," he said.

Congresswoman Judy Chu, elected in 2009 to represent the 27th district that includes JPL and Caltech, presented a Congressional certificate of recognition to the Laboratory.

"I will always be your ally in Washington, D.C.," said Chu, "and will continue to fight for funding to NASA and JPL."

State Senator Anthony Portantino presented a legislative resolution recognizing Voyager as "one of the most audacious scientific endeavors of all time."

Representatives for U.S. Rep. Adam Schiff, Assemblywoman Laura Friedman and Los Angeles County Supervisor Kathryn Barger were also on hand for remarks.

Former JPL Director Dr. Ed Stone told the gathering that when he was offered the position of project scientist he was



From left: Voyager Project Manager Suzy Dodd, Project Scientist Ed Stone, Communications and Education Director Blaine Baggett, JPL Chief Engineer Chris Jones and John Casani, Voyager's first project manager.

told the commitment was for four years. Hardly, as it turns out.

"There was no way to know whether a spacecraft — never mind two — could go for 40 years," said Stone, Voyager's only project scientist since 1972, who still receives requests for interviews on Voyager from around the world.

Two commemorations took place Thursday, Aug. 24 — an event featuring four key Voyager veterans and a von Karman lecture by a 44-year member of the project.

A Pickering Auditorium panel discussion Aug. 24 included Stone; John Casani, a veteran JPL manager and Voyager's first project manager; Suzanne Dodd, a former Voyager engineer and the current project manager; and Chris Jones, Voyager's fault protection engineer.

"(Before Voyager,) Mars was as far as

we had ever been," said Casani. "So it was quite a challenge."

But JPLers were up to it.

The panel chat was interspersed with video clips featuring historic interviews, launch footage, and Voyager team members' agonizing waits for data return, debating science on the fly, and celebrating.

"Over a period of seven months we were overwhelmed with discoveries, one after another," said Jones. "I felt a sense of discovery. These odd-shaped worlds just blew us away."

Dodd, at the time a young engineer straight out of Caltech, built Voyager's closest approach sequence.

"From a science point of view, there's a tremendous amount we have learned about the solar system," said Stone. "The two orbiters will travel for billions of years

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# Eclipse brings JPLers outside, together

Employees take the time to enjoy nature's wonder

By Susan Braunheim

Much of the Lab came out to enjoy the partial solar eclipse on Aug. 21. Buildings emptied and the Mall filled up as the partial eclipse drew thousands of JPLers outside.

Excited spectators started gathering well before the Public Services Office was expected to start handing out solar eclipse glasses. By the end of the event, the office had distributed more than 1,500 glasses to employees on the Mall, along with a 2017 Eclipse Across America handout from NASA.

"It was amazing, the number of employees who were out in the mall well before the beginning of the eclipse," said Kim Lievense, manager for Public Services.

Once equipped with safe eyewear, the crowd turned their attention skyward, matching the unusual event above with a unique sight below: a sea of upturned faces with smiling, open mouths.

One of those participants, Alexander Mrad, administrator for the Science Division, had been looking forward to watching the eclipse for months. "It's such a rare event, which is exciting in itself. I also wonder how people thousands of years ago would have been shocked and frightened by it," Mrad said.

"We have come such a long way and I am so happy to be a part of something so big. All the JPLers gathering together on the Mall is a great feeling."

"Eclipses happen so infrequently, and being here at JPL makes it so much more special. It is exceptional knowing that we are a part of a group working to learn more about these types of events," said Alexandria Deisler, a project resource analyst for the Project Resource Controls 9x/1x Group.



JPL's Education Office supplied a solar projector (a simple telescope that projected an image of the sun onto a piece of paper), a solar telescope and several pinhole cameras made from items like cereal boxes and postcards for viewers to look through during the event.

Kimberly Orr, web producer for the Education Office, helped with the equipment and answered questions throughout the eclipse.

"It was great to see that even at JPL, where people make amazing discoveries about space every day, the eclipse generated so much enthusiasm," Orr said. "It goes to show why it's so important that we share what we do, especially with students, and encourage others to explore the wonders of space."

In addition to hosting the gathering on Lab, the Education Office organized a group of volunteers from JPL to go to nine locations around Los Angeles to hand out glasses and provide information and activities related to the eclipse. Jeff Nee of JPL's Informal Education Group, who organized the effort, equipped each of the site leads with a box of resources, including materials to make pinhole cameras.

The team also created a set of eclipse lessons for teachers as part of their Teachable Moments blog, aimed to show educators how to turn JPL and NASA news into lessons for students.

In the Pasadena area, the partial eclipse began at 9:05 a.m., reached its maximum of 62 percent at 10:21 a.m., and ended at 11:44 a.m. About 12 million people traveled to locations of totality across the country during the eclipse.

Judging from the half-empty parking lot Monday, more than a few were JPLers.

Kevin Tally, an engineer in the Cross Mission System Development and Implementation Group, used the eclipse as a reason to travel and catch up with old friends in Hopkinsville, Ky.

"We were very close to a wooded lot and could hear the confusion of the cicadas as the darkness grew. It was such a cool experience," Tally said.

Eclipse viewers are encouraged to share their photos on social media by using #Eclipse2017 and tagging @NASAJPL.

For more information on Teachable Moments, go to <https://www.jpl.nasa.gov/edu/news/column/teachable-moments>.

# Parking app competition spurs creative ideas

By Mark Whalen

For decades, a scarcity of parking has been a nagging issue at the Laboratory. Too many cars, not enough spaces.

More parking will not materialize, but to help find the available spaces, some help is on the way.

Soon, there will be an app for that.

A recent competition to develop an app to help JPLers identify available parking produced two winning entries that will aid the creation of the app that will be available for use within a couple of months.

“The two winning apps written by Noppasin Niamsuwan (SweetSpot) and Mihai Alex Ruber (Rocket Park) exemplified boldly looking at unconventional and creative solutions,” said Brent McWatters of the Custom Application Consulting and Development Group, one of the judges in the competition. “Their proposed solutions provide JPL exciting possibilities and many of their features will be used in the final Android and iOS apps to alleviate our difficult parking situation.”

With in-ground car sensors being installed in September or October, JPL is working on having Android and iOS (iPhone) apps available Labwide for download in that timeframe. The primary goal for the first iteration is providing essential parking information to those coming to JPL in a way that doesn’t distract from their driving, said McWatters, whose group will develop the working app.

Give JPLers a challenge, a goal and a competition, and the creative juices get flowing.

Niamsuwan, a signal analysis engineer in the Radar Science Group, knows the issue first-hand. “I’m in this situation too,” he said. “Almost every day, 30 minutes of my precious time is drained by this parking problem. I saw an opportunity to solve

my own problem as well as other JPL colleagues’ at the same time.”

A self-described “newbie” to app development, Niamsuwan created a hands-free app that speaks and automatically switches views to display a forecast and the real-time status of selected parking lots. Once the user enters the lot, the app turns itself into a navigation tool, guiding the driver along the path that maximizes the chance to find an available spot.

To create his app, Niamsuwan toiled for a few weekends, a few long nights, and “a couple of hours of exercising by walking up and down in the parking structure just to feel the field.”

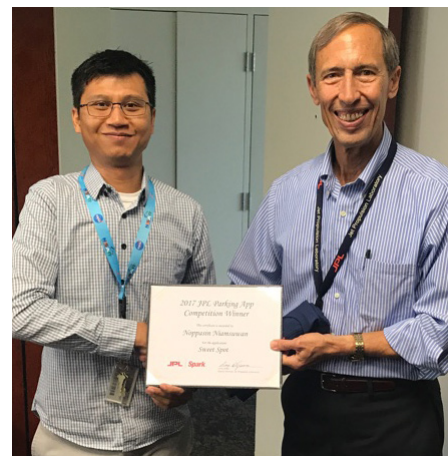
“The learning curve was not as steep as I thought and the satisfaction from creating your own tool is almost instant,” he said.

Ruber, a UC San Diego intern in JPL’s Flight Engineering Group, still can’t believe he was chosen as a winner. “I’m thankful for the opportunity and the recognition,” he said. “And I want to thank NASA for giving me the opportunity to intern here; it’s been an absolutely wonderful and life-changing experience.”

Ruber’s app design offers users the ability to quickly and easily view currently available parking spots around JPL and sends out push notifications when users have reached a certain radial distance from the Lab. To help employees plan their day, he said, the app has an interactive graph that predicts and recommends the best places to park at any given date and time in the future. And it uses augmented-reality technology to point and direct users to available parking spots.

Ruber will soon return to UCSD to complete his undergraduate degree in applied mathematics and computer science. He’s already brainstorming the future.

“Implementing augmented-reality tech-



JPL Deputy Director Larry James presents certificates to co-winners Noppasin Niamsuwan (above) and Mihai Alex Ruber.



nology to create virtual tours for visitors, employees and future interns is something I’d like to add,” said Ruber. “In the future, I envision augmented reality ‘heads-up display’ windshields or autonomous cars that can locate and self-navigate the driver directly to the closest open parking space.”

The new app will be available for both JPL and non-JPL issued phones, said McWatters. Most JPL-issued phones will have the app downloaded to their device automatically once it becomes available.

The first version this fall will be a more basic app, said McWatters, with more advanced features to follow in later releases.

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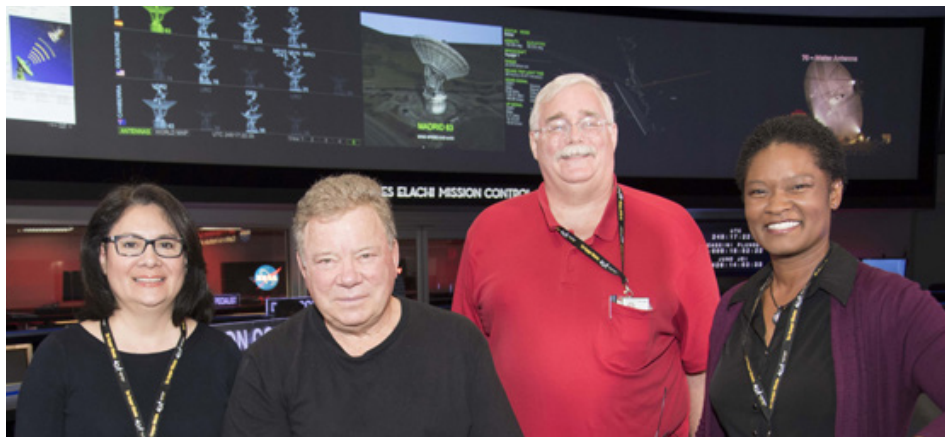
# Capt. Kirk sent a message to Voyager at JPL

With help from Star Trek's Capt. Kirk, on Sept. 5 — the 40th anniversary of Voyager 1's launch — NASA revealed the winning #MessageToVoyager and beamed it into space.

"Message to Voyager" is a social media campaign inspired by the messages of goodwill carried on the Golden Record aboard each Voyager spacecraft.

The winning message: "We offer friendship across the stars. You are not alone." It was submitted by Oliver Jenkins and announced on NASA Television.

As part of the celebration of Voyager's 40 years of continuing exploration, NASA invited the public to submit short, uplifting messages to the Voyager 1 spacecraft and all that lies beyond it. These messages were a maximum of 60 characters and were tagged



From left: Annabel Kennedy, William Shatner, Jeff Berner, Tracy Drain.

#MessageToVoyager. NASA tracked more than 30,000 submissions.

The Voyager team, together with JPL and NASA headquarters, selected their 10 favorites, which were then put to a public vote. The winning message was sent into interstellar space by a command that originated from mission control at JPL with help from the original Capt. Kirk, William Shatner; Tracy Drain, Juno mission deputy chief engineer; Jeff Berner, DSN chief engineer; and Annabel Kennedy, DSN command engineer.

Watch here: <https://voyager.jpl.nasa.gov/message>.

## R2D2 made by JPL engineer

By Leslie Mullen

A mobile replica of R2D2 visited the Mall Aug. 3, complete with all the beeps and whistles of the beloved Star Wars character. The droid was built by Keri Bean, a Mission Operations Engineer at JPL.

Bean is a member of the R2D2 Builders Club (<https://astromech.net/>), which currently has about 150 local members, and 3,000 members around the world.

"It took two years and a month, between getting all the right parts and doing all the work, to build it," she said, and she's still working on making it a fully complete model. Future plans include adding a pico projector, for what would R2D2 do without the ability to transmit holographic messages?

She's cut R2's speed down to 5 percent of what it was originally capable of, but it still scooted around the Mall fast enough to outrun any Imperial droids that might be chasing it.



Keri Bean

### PARKING APP *Continued from page 3*

"We are looking at a design where users can be notified a couple miles before they approach the Lab so they can choose which exit to take based on the parking situation, without having to even open the app," said McWatters, who added that historical data will also be available for predicting when lots will be full

days in advance.

"All the parking app contest entries — and the winning apps in particular — demonstrated creative approaches that will be utilized in creating a useful parking app," added McWatters.

To see the finalists' presentations at the judging ceremony, visit JPL Tube: <https://jpltube.jpl.nasa.gov/Watch=4KFeCm>.

as our silent ambassadors.”

“Voyager has been publically engaging, not just scientifically engaging,” said Casani, who contacted scientist Carl Sagan about the type of message that should be included on the spacecraft. The result was Voyager’s Golden Record, which contains images and sounds selected to portray the diversity of life on Earth.

Alan Cummings, a Voyager team member since 1973, described his experiences during the von Karman Lecture Series Aug. 24 (at JPL) and 25 (at Pasadena City College).

Cummings was in charge of telescopes.

“The front aperture was covered in a thin aluminum foil, 3 microns thick. We were afraid that a technician could poke a hole in them. So right before we sealed up the spacecraft for launch, I got to go up there and look at them. I didn’t find any holes but I found one that was loose, so I tightened it.

“That was very exciting. I was the last one to inspect it.”

Cummings, a senior research scientist at Caltech, noted Voyager is “an amazing machine with very robust systems.” Then he added some perspective.

“Your iPhone with 16 gigabytes of memory is 235,000 times more powerful.”

(Cummings’ presentation is available at <https://jpltube.jpl.nasa.gov>.)

Friday’s event on the Mall was also a feel-good return to the 1970s with a concert by the JPL rock band “The RTGs.”

In tribute to the rock legend who performed on the JPL Mall in 1989, the band led off with Chuck Berry’s “Johnny B. Good,” a song that is on the Golden Record. The group then moved to the ’70s with Toto’s “Hold the Line,” “Dreams” by Fleetwood Mac, “Smoke on the Water,” by Deep Purple, Foreigner’s “Double Vision” and finally “Comfortably Numb” by Pink Floyd.

The band exhibited a bit of poetic license on the last number. Keyboardist Liz Landau sang replacement lyrics near the end of the song, starting with a rhyme for “There is no pain, you are receding”:

“Science you send, we are receiving  
From distant ships beyond the horizon  
Your signals come to us in waves  
So faint, sometimes we don’t know what you’re saying

When I was a child I saw your Neptune pics  
On PBS in 1989  
Moving outward, farther still  
Ambassadors with sights and sounds from Earth  
A record gold

A dream lives on  
You ... are Voyager 2 and Voyager 1.”

In August 2012 Voyager 1 became the first human-made object in interstellar space, while Voyager 2 is expected to enter the space between the stars in the coming years. For more information on the mission, visit <https://voyager.jpl.nasa.gov>.

## News Briefs

### NASA awards Caltech contract extension to operate JPL

NASA has awarded a contract to Caltech to extend operations of JPL through Sept. 30, 2018.

This contract extends the agreement between Caltech and NASA for management of JPL beyond its current expiration date of Sept. 30, and has a maximum value of \$2.5 billion. Work on the cost plus fixed-fee, indefinite-delivery/indefinite-quantity contract begins Oct. 1.

The purpose of this contract is to develop and sustain core competencies in support of NASA-sponsored work in the areas of Earth and planetary sciences, heliophysics, astrophysics, and aeronautics and space activities, to include the development of spacecraft and instruments.

Caltech also will manage NASA-sponsored programs that carry out competed and peer-reviewed research, NASA partnerships with other government agencies, academia and the private sector, and the operation, research, and management of NASA’s Deep Space Network.

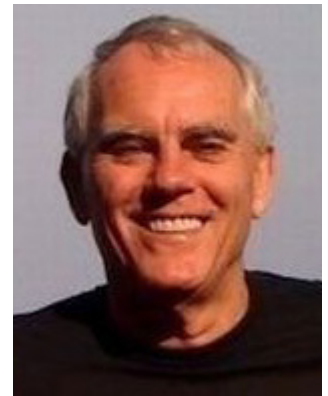
## Passings

Planetary scientist and visualization specialist Eric De Jong, 70, died Aug. 13.

De Jong, principal investigator for the NASA/JPL Solar System Visualization Project, joined JPL in 1990. He was considered a pioneer in the rapid development of visualization products and image processing for both scientific investigation and public outreach and education.

His work created vivid experiences of many of NASA’s most successful missions including Juno, Mars Science Laboratory, Mars Phoenix, Mars Pathfinder, the Mars Exploration Rovers, Mars Odyssey, Mars Reconnaissance Orbiter, Lunar Reconnaissance Orbiter, Magellan, Galileo, Ulysses, Voyager, TOPEX/Poseidon and the Shuttle Radar Topographic Mission.

This year, De Jong was awarded NASA’s Distinguished Public Service Medal



Eric De Jong

for his visualization work communicating to the public humanity’s exploration of the cosmos.

Cremation services were private.

## Letters

My heartfelt thanks go to JPL for the beautiful plant sent in memory of my mother, Maxine Williamson, who recently passed away. I am particularly grateful to my colleagues in the Project Support Office who made a generous contribution to a charity my mother supported, the Ozark Food Harvest food bank serving people in need in SW Missouri. My mother, even though not able to finish high school, was an avid reader in many areas and, in particular, followed NASA and the Lab’s activities for more than 40 years. She was proud of her family connections at JPL and would be thrilled to know she was remembered by so many kind and supportive co-workers of mine.

**Dave Durham**

# Classifieds

Ads submitted Aug. 26–Sept. 1.

### For Sale

MISC.: very lightly used Ethan Allen Tribeca sofa-sleeper, exc. cond., comes from smoke-free/pet-free house, w/matching ottoman on wheels w/storage space, \$600/obo; very clean & fully functional GE refrigerator, \$150; Nordic Ware microwave tender cooker, \$40; 27" KitchenAid microwave w/trim kit to install in cabinet or can be used on kitchen counter (both items for \$225, will consider selling separately). 818-369-6640.

SECTIONAL SOFA, large, navy blue fabric, good condition, reversible back & seat cushions, 4 pieces total, includes 2 chaises (~14' x ~68"), photo available; \$300. Call or text 626-340-3405.

### Vehicles / Accessories

MOUNTAIN BIKE, Trek Y22 carbon; been in storage since purchase, may need a tuneup, all original from 2nd owner, ridden only a few times; a rare steal for a carbon mountain bike; I'm 5'9" and it fits perfect; tires/tubes in great cond., no dents, dings or drops; pickup only. Text 818-370-5774.

### Wanted

SPACE INFO/memorabilia from U.S. & other countries, past & present, for personal use (see <http://www.youtube.com/watch?v=S7PvjGp7mCU>). mrayman @alumni.princeton.edu, 818-790-8523, Marc Rayman.

### For Rent

ALTADENA, short or longer-term rental available; furn. bedroom in a beautiful 4 bd. / 2-bath house, includes desk, dresser, bedding, towels, WiFi, etc.; share common areas w/2 considerate JPLers; lg. kitchen w/ample storage, quiet/safe neighborhood; lg, fenced yd. w/mature fruit and shade trees, easy bike to JPL (1 mile); includes all utilities; \$825/month. Louise, 818-653-9600, louise@louiseh.org.

LA CANADA, single family home (3 + 1.5) on quiet cul-de-sac, 249 Mero Lane (walk to JPL); 3 bedrooms, 1.5 baths, 2-car attached garage (plus circular drive w/parking in front) fenced yard w/electric gate, hardwood floors, central

a/c + heat, gas fireplace with/hearth, side-by-side refrigerator (if desired), laundry in garage; water & gardener included, schools are walking/biking dist., Paradise Cyn. Elementary; property is very clean, light and charming; avail. for 1-year lease on Sept. 15; no pets; \$4,000/month. bill5378@hotmail.com.

PASADENA, 2 beds + 2 baths, 1617 Monte Vista St., view on Zillow, charming Craftsman bungalow, updated in/out, nice mix of vintage quality and modern convenience, wood floors, gas fireplace, central air, in-unit washer and dryer hookups, owner pays water and gardener; great location, walk to Metro Gold Line Allen station and Jefferson Park; off-street parking w/convenient electric vehicle charging up to 40 amps; \$2,745/month. Call or text 818-468-7286.

PASADENA, furn. room in a lovely 4-bd./2-bath house, big backyard, hardwood floor, big closet, shared bathroom, kitchen and laundry privileges; 2 miles to JPL, close to public transportation; short- or long-term lease available; must like dogs and be very clean; \$900 + \$900 deposit. 818-960-8654.

WEST L.A., from November through January, looking for house- and pet-sitter; have the (gentle) use of our lovely 3-bedrm. home near Santa Monica, take care of our elderly dog and cat, all for \$400/month, that just covers utilities. Call or text 310-795-4077, Peter.

### Vacation Rentals

MAMMOTH, Snowcreek, 2 bd., 2 ba. + loft, sleeps 6-8, fully equip'd kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/mtn. vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL discount, no pets. 626-798-9222, 626-840-3749 or valeriee@caltech.edu.

MAMMOTH, Snowcreek, beautiful updated condo, 2 bd., 2 ba. + loft (sleeps 6-8), great location by pond/meadow, new appliances, TVs, DVD players, free wireless Internet and washer/dryer, no pets. 818-952-2696 or BigMtnPrettySky@gmail.com.

MAMMOTH, remodeled 2 bed/2 bath + loft, short walk to Canyon Lodge; Courchevel 6 features full kitchen, cable/Internet TV, DVD, Blu-Ray, wireless hi-speed Internet, 2-car garage, Jacuzzi, grill, pool; no pets. <http://Courchevel6.com>.



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Universe

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Universe is published by  
the Communications and  
Education Directorate of the  
Jet Propulsion Laboratory,  
4800 Oak Grove Drive,  
Pasadena, CA 91109.