



Bruce Murray

TRANSPORTED TO THE PLANETS

The science, advocacy and JPL leadership of Bruce Murray, 1931-2013

By Franklin O'Donnell

Bruce Murray, the outspoken advocate of planetary exploration who served as JPL's director during one of the most challenging periods of the laboratory's history in the late 1970s and early 1980s, died Aug. 29.

Murray, 81, passed away at his home in Oceanside from complications from Alzheimer's disease.

A geologist, Murray became known as an expert in imaging on early Mars missions before being appointed JPL director in 1976. He argued vigorously for planetary missions as NASA focused on developing the space shuttle program, and saved the Galileo mission to Jupiter from cancellation. In 1979, he joined with Carl Sagan and JPL engineer Louis Friedman to found the Planetary Society, a membership-based nonprofit organization dedicated to exploring the solar system and expanding public advocacy for space exploration.

Murray "worked tirelessly to save our nation's planetary exploration capability at a tumultuous time when there was serious consideration for curtailing future missions," said current JPL Director Charles Elachi. "Long after returning to Caltech as a professor, he continued to be a strong voice in expressing the importance of space exploration."

Born in 1931 in New York City when his parents lived there briefly, Murray grew up in California and spent significant time in Mexico in his youth. His academic work at Santa Monica High School was undistinguished—he later recalled that he received a D in physics—but he blossomed at the Massachusetts Institute of Technology, where he received bachelor's and master's degrees in geology, followed by a doctorate in 1955.

Murray then worked for Standard Oil, and later speculated that he might have spent his life in the oil business if it had not been for an ROTC obligation to serve two years in the military. He spent two years in the Air Force conducting gravity and geodesy studies.

In 1960, Murray put in an application to join Caltech, and came to the campus as a postdoc research fellow. He spent much time in the early 1960s making infrared observations with ground-based telescopes including the 200-inch at Mt. Palomar, observing Venus at the same time as Mariner 2's historic flyby in 1962.

Murray said he first saw Mars through a telescope in 1960, atop Mt. Wilson. "I felt transported to Mars itself," he later wrote. "That night I fell in love with observational astronomy and with planet Mars."

Appointed in 1963 as an associate professor, Murray was invited by Caltech colleagues to become a member of the imaging team for Mariner 4, the first flyby mission to Mars, at a time when some scientists questioned the value of optical imaging on planetary missions. He then joined the imaging teams for the Mariner 6-7 Mars flyby missions and the Mariner 9 Mars orbiter. He became imaging team leader for Mariner 10, which flew by Mercury and Venus in 1973-74.

Murray later recalled that, after those missions, he decided to abandon space missions and focus his scientific work on earthquake studies on Earth. One reason was his disappointment in plans for the next Mars missions, the Viking 1 and 2 landers and orbiters. He felt that Viking's goal of searching for life was unrealistic given the technology of the time.

His plans changed abruptly, however, when he was approached by the search committee seeking a successor to JPL Director William Pickering, who had led the lab for more than two decades. Murray came to JPL in 1976, just three months before the first of the two Viking landings.

With many JPL personnel long-ensconced under Pickering's tenure, Murray thought the time was ripe for change. Just three months into the job, he announced layoffs and

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Bolden surveys Earth missions

Administrator also bestows major award for contractor support

NASA Administrator Charles Bolden recently received an up-close and personal view of the status of several of JPL's Earth science missions being readied for launches next year.

On his way west, Bolden on Aug. 9 stopped by the Gilbert, Ariz. facilities of Orbital Sciences Corp. for a briefing on Orbiting Carbon Observatory 2, currently in final assembly and environmental testing in preparation for launch in July 2014. The mission will be NASA's first dedicated Earth remote sensing satellite to study atmospheric carbon dioxide from space.

Four days later, Bolden checked on the progress of two missions being built at JPL for launch next year. The administrator was briefed by engineers preparing ISS-RapidScat, a scatterometer that will be mounted outside the International Space Station to measure ocean surface wind speeds and directions, and the Soil Moisture Active Passive spacecraft, which will produce global maps of soil moisture for tracking water availability around the planet.

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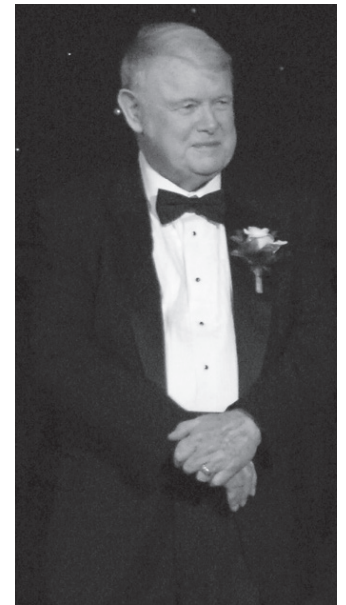


NASA Administrator Charles Bolden addresses reporters in JPL's Spacecraft Assembly Facility cleanroom.

Photo by Veronica McGregor



Clockwise, from top left: Bruce Murray in 1968; Murray (center) with Caltech Summer Undergraduate and Research Fellow students in 1986; with astronomer Carl Sagan (right) looking at a map of Mars; accepting an award from the American Institute of Aeronautics and Astronautics in May 2008; with author Ray Bradbury (left) in 1975; Murray (right) at the White House with President Jimmy Carter (second from left); at Mariner 10's Venus encounter in 1974; (center) with Prince Charles of the United Kingdom at JPL in 1977.



a major reorganization that shook up—and shocked—the lab. “A lot of people there felt that they were being driven extremely hard,” he later remembered. But, he believed, “the outcome of this was that JPL [became] a far more sophisticated organization.”

One of Murray’s priorities was to improve relations between JPL and the Caltech campus. Up to that point, he said, “Caltech, the campus, had very little to do with JPL’s being.” Murray worked to “change attitudes and reduce hostilities,” but didn’t make as much progress as he hoped on creating joint appointments and programs. He also promoted opportunities for women and underrepresented minorities, creating a Director’s Advisory Council for Women that exists today.

In 1977—the second year of Murray’s directorship—Voyager 1 and 2 were launched to the outer planets, but the pipeline of planetary missions was then alarmingly dry. NASA was intent on developing the space shuttle as an all-purpose launch vehicle, and as it ran into budget problems resources for planetary missions became vulnerable. Murray feared it would lead to “the demise of the planetary program.”

At one point, a committee chairman in Congress led an effort to cancel JPL’s Galileo mission to Jupiter, then scheduled to launch in 1982. Murray mobilized an effort to save the mission; “it was really kind of grim,” he later remembered, “but we beat him.”

After Ronald Reagan’s election victory in 1980, Murray hoped the new U.S. president would be pro-space, given his stance of competition with the Soviet Union. Murray threw his efforts into promoting a U.S. flyby mission to Halley’s Comet in 1986, but was bitterly disappointed when he was unable to get his proposal past White House intermediaries. In late 1981 he gave up on the Halley proposal, and by the next summer resigned as JPL director.

“It was all over,” he recalled later. “They were trying to kill the DSN [Deep Space Network] and Voyager and everything else at that point, and I had to throw in the towel.” To keep the lab afloat, he convinced Caltech’s faculty that JPL should take on up to 30

percent of its work for the Department of Defense.

After returning to Caltech, Murray devoted his energies to teaching, research, Planetary Society efforts and travel, serving as a visiting professor in France, China and Japan. He served on the science teams of a Soviet-French Comet Halley mission and several Russian Mars missions, and had an experiment on the ill-fated Deep Space 2 microprobes carried by 1998’s Mars Polar Lander. He also wrote several popular books and more than 130 scientific papers.

Murray is survived by his wife, Suzanne, five children and 11 grandchildren.



Taking a Breath

Gene Tattini's retirement will cap a fast-paced 12 years at JPL

By Franklin O'Donnell

After 12 years as JPL's Deputy Director—a period in which the laboratory launched an astonishing 27 spacecraft and major instruments—Gene Tattini will retire on Sept. 20. Tattini—who came to JPL after a long career in the Air Force where he served as a Lieutenant General—here reflects on his time at the lab.

What is most memorable to you from your time at JPL?

There's no question that the high points of my time here were the landings on the surface of Mars. As Charles [Elachi] puts it, "Dare mighty things"—and these events reflect the best of what JPL can do.

The other thing that really stands out in my mind is the resiliency of this place. I arrived in July of 2001, and on the 11th of September of that year we went through a national tragedy. Watching the way that the men and women here at JPL handled that was absolutely amazing.

In fact JPL has faced all kinds of challenges over the past dozen years. We and all of NASA went through the loss of [space shuttle] Columbia. Just after that we had our two Mars Exploration Rover landings, and we knew the entire reputation of NASA was at stake.

In 2009 we had the Station Fire. An event like that is when you really start

to appreciate the men and women who provide us with our security here at JPL, our urban search and rescue folks who devote a lot of their own time to being properly trained, helping not only JPLers but also the community. And then our professional firemen. Knowing that their families may be in danger, they come to work and really put it out.

I also remember when we lost several of our JPL family members in a tragic van accident, and the way the lab came together to support those families. That's something else that sticks in my mind that really shows the character of the people who work here.

Coming from the Air Force, how different was JPL? Was it a big culture shift?

You know, a lot of people make a big thing of that. There were differences in some respects, but in most ways it was not a big jump. I spent the final 15 years of my Air Force career in the military space business, and whether you're in uniform or civilian clothes, it's kind of the same. The engineering challenges are the same, and the way we approach them is very similar. Where the cultural gap came in was more in terms of a lot of the institutional environment. When you have a function in the military, you expect

everybody to come and they know they are expected to show. In civilian life, it's not that way. So that was a little bit of a cultural adjustment both my wife and I had to go through.

What is a typical week or month like for a JPL Deputy Director?

A lot of depends on how the Lab Director wants to use his Deputy. Over the time that Charles and I have been together, we've developed an operating pace. There's no question that Charles is the rainmaker here. He is the face to the outside of JPL for the most part. He is extremely well-respected in the scientific community, supremely well-respected for his engineering excellence. He expects me to step back and more or less keep the Lab running, to make sure that the men and women here at JPL have the resources to do their job. I spend a lot of time working with the institutional side of the house—security, facilities, human resources—everything that is necessary to make JPL successful. I have a lot of expertise in the acquisition area, so I get involved with working out some of the major contracts.

Are there particular areas in which you feel you've left an imprint on JPL?

You know, you always try to leave a place better than when you found it. I don't know about an imprint, but when I sit back and think about it, one of the things I did was to convince JPL to bring in professional leadership in key areas such as the Chief Information Officer organization and Human Resources. We took HR out of the business function and now have a separate and distinct human resources organization. In the business area, we brought in a Chief Financial Officer from industry, and he set up a very strong financial organization at JPL.

Someone mentioned the other day that I was the first guy to establish an acquisition strategy panel for acquisitions over the \$50 million mark. JPL had never done that before, but we've found it to be very effective.

Looking at where the lab is headed now, is there a direction you'd like to see it go? Anything you feel that it needs?

That's a good question. We're very self-critical here—if we have a fault at JPL, it's that we don't step back and give ourselves enough credit. We spend a lot of time thinking of better ways to do things, which is healthy—if you don't do that, you'll atrophy and die. There is not any really big thing that I think Charles would have liked to have seen done that we haven't done. In the final analysis, you can't argue with success—and this place has been successful.

What are your plans?

As my daughters tell me, "Dad, you need to step back and take a breath." So I'm going to do that. I hope to stay active in the business. I have a couple of public speaking things. I'm involved with the state of California on the military retention and reuse commission, and there are some potential opportunities to help small companies do business with the government. But none of that is in concrete right now. I just plan to take a breath and see what happens next.



Gene Tattini, top left, with Charles Elachi; above, in superhero costume for a United Way campaign.

News Briefs



Sarath Gunapala



Murthy Gudipati



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Gunapala receives photonics honor

JPL Senior Research Scientist Sarath Gunapala in September will receive the Institute of Electrical and Electronics Engineers Photonics Society's Aron Kressel Award, the society's highest award for the development of photonics device technology.

Gunapala's honor is for pioneering contributions to the development of quantum structures—based infrared detectors and imaging focal plane arrays.

Gunapala has authored more than 250 journal publications, several book chapters on quantum well infrared photodetectors, and holds 22 U.S. patents. In 2011, he received JPL's Magellan Award for his leadership in the development of technology for high-performance infrared focal planes for space exploration. He also has received JPL's Lew Allen Award for Excellence, JPL's Exceptional Achievement Award for Technology Applications Program and the NASA Exceptional Engineering Achievement Medal.

He will receive the award at ceremonies Sept. 9 at the Photonics Society Conference in Bellevue, Wash.

Alumni award for Gudipati

Murthy Gudipati of the Planetary Ices Group was recently honored for his contributions as a founding member of the Indian Institute of Science Alumni Association of North America.

He received the award at the organization's global conference in Chicago. "Over the past decade I have been actively involved in building this alumni association with a single unified goal of 'giving back' to the society where we live, where we came from, and where we got our education," he said.

Gudipati earned a Ph.D. from the Indian Institute of Science in 1987. He has been with JPL since 2007, where his recent research has focused on physics and chemistry of cryogenic ices.

Parking structure update

Construction on JPL's new east lot parking structure continues apace and remains on schedule for opening next August.

Recent work has focused on widening the road running from the Arroyo Lot toward the East Gate to provide access

to the structure. Crews are also currently performing demolition and re-grading work to relocate Building 322, a storage facility that recently housed the Athlete rover, to a new spot near the thermal-vacuum chambers up the hill in the northern part of the lab.

Crews are expected to start digging footings to support the structure by early September, said Swinerton Builders superintendent Bobby Chambers. Major utilities (gas, water, communications) running through the area now are being relocated and a new 450-foot retaining wall at the structure site is about 50 percent completed, he added.

The structure will be built in an area that was washed out by rainstorms in 1969. To help tamp down the soil, the contractor employed a "rapid impact" machine that periodically drops a heavy weight into the ground to improve the soil's ability to bear the weight of the structure.

The West Arroyo parking lot will be closed until completion of the 1,400-space structure in August 2014.

One item that came up during review of the environmental documents for the structure was the possibility that Native American tribes may have lived along the edges of the Arroyo Seco. As a result, an archeologist was hired to observe the excavations.

The archeologist inspected the work area near buildings 11 and 103, which according to aerial photos looked to be undisturbed as far back as 1938, said Chuck Buriel, manager of JPL's Environmental Affairs Program Office. "The idea was that if Native American tribes had lived on the shores of what became the Arroyo Seco, there might have been some artifacts," Buriel said. The site could have proven to have historic significance as well.

While digging for the road widening, crews came upon a fascinating find from the era of propulsion work that set the stage for JPL in the Arroyo: a Coke bottle dated 1948.

But the archeology inspection yielded nothing more interesting, Buriel added. "We found no indication of ancient peoples living in the area; just bottles and a few cans."

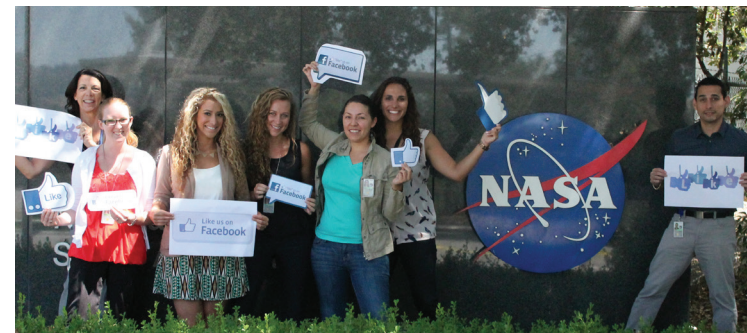
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ISS-RapidScat is scheduled to launch in April 2014, with the Soil Moisture Active Passive spacecraft scheduled for an October 2014 liftoff.

While at JPL, Bolden also presented the 2013 George M. Low Award, NASA's premier performance honor for contactors and subcontractors, to ATA Engineering Inc., an employee-owned small business in San Diego that made key contributions to Mars Science Laboratory.

"Small businesses are critically important to what we do," said Bolden at the award ceremony. He also told ATA executives that he was impressed with the company's "achievements and problem-solving." Mars Science Laboratory "would not have possible without your contributions," Bolden added.

"It has been a great privilege to work with you," said ATA President Mary Baker. "JPL is like a candy store to engineers,



Members of Human Resources' university recruitment team promote "likes" for their Facebook page. From left are Paula Caterina, Danielle Garcia, Vanessa Gonzalez, Natalie Kiel, Amy Sanchez, Lisa Tanury and Mario Portugal.

University recruiting goes social

By Emily Schneider

JPL University Recruiting launched its social media presence on Facebook and Google+ in late July. Previously, social media at JPL had featured the missions, technology and innovations, but now the new "JPL University Recruiting" pages seek to highlight the people behind the missions to give an insider's view of the lab and highlight what it's like to work at JPL.

The pages give an insider's look through posting photos of events on lab—like Wave@Saturn and the Curiosity landing anniversary—as well as sharing and connecting with the other social media sites and providing information

of JPL-sponsored events at various campuses. The new social media presence geared specifically for university recruiting also strengthens online ties with partner universities. Additionally, it provides another avenue to connect with the recruiters and better understand the application process.

Since going live, the pages have a combined following of close to 1,000 people and have made nearly 150,000 impressions, expanding the reach of the recruiting team as they prepare for the new Workforce 2020.

Check out JPL University Recruiting sites on Facebook, www.facebook.com/JPLUniversityRecruiting, and google+, bit.ly/15FrXMD.

Passings

William M. Harris, 77, a retired test engineer, died May 25.

Harris joined JPL in 1959 and retired in February 2013. He contributed to JPL efforts in communications systems development, observational systems, spacecraft telemetry and command, and microwave observation systems. The last project he worked on was the chemistry and mineralogy instrument on Mars Science Laboratory's Curiosity rover.

In 1992, Harris received NASA's Exceptional Service Medal.

He is survived by his wife, Sandra; daughters Shari Lee Sommers and Susan Youngblood; and granddaughter Kimberly Youngblood. Memorial services were held June 5 at Forest Lawn in Covina.

Letters

I would like to thank my JPL colleagues for condolences and comforting support following the recent passing of my father. My wife and I greatly appreciate the beautiful plant sent by JPL.

Boris Karasik

Thank you so much to JPL and all my co-workers and friends for the beautiful plant, kind words, and wonderful cards and thoughts during the recent passing of my father. My family and I appreciate all your concern.

Tuan Do and family

I would like to say thank you to everyone for the sympathy and support for the passing of my father. I would also like to thank Group 3224 for the lovely orchid. Your thoughts and prayers are greatly appreciated.

Joe Masiero

Retirees

The following employees retired in August:

Robert Kouol, 44 years, Section 352N; **Richard Key**, 35 years, Section 312B; **Amy Walton**, 35 years, Section 8040; **George Fox**, 33 years, Section 312C; **Jerry Suitor**, 31 years, Section 1080; **Pamela Woncik**, 24 years, Section 3011; **Robert Orens**, 15 years, Section 3764.