

Scrutiny before decision

Discovery proposal site visits review new missions' readiness

While some space missions are assigned directly to JPL, in recent decades the Lab has won them through competitions. And a critical decision milestone is looming for a trio of JPL-managed mission proposals.

Last year, NASA's Discovery Program made a first-round selection of five mission concepts for further study, including three with JPL project management—VERITAS, a Venus orbiter; Psyche, a mission to a metal asteroid; and NeoCam, a survey of near-Earth asteroids.

NASA is expected to pick one or two of the five proposals shortly to be developed as full-up flight projects. To make those decisions, some 25 NASA subject-matter experts have been paying visits to JPL and other sites to grill proposal team members on each project's readiness. This event—the “site visit”—is an opportunity for principal investigators and their teams to make a huge impression. By mid-November, all three site visits will

be completed.

“We have one day to make an impact,” noted Tony Freeman, manager of JPL's Innovation Foundry Office. “You've got to explain your concept, defend it and show that you function very well as a team and are therefore worthy of the trust of spending several hundred million dollars of the taxpayers' money.

“The principal investigator is absolutely connected to this,” added Freeman. “And the team is connected too.”

NASA reviewers will draw up a list of each proposal's strengths and weaknesses, based on the team's concept study report outlining all aspects of the mission. During the site visit, reviewers use that background to grill each proposal team with an exhaustive array of questions.

“Not only does the team have to answer the questions satisfactorily, they've got to get through all of them,” said Freeman. “How the team manages the time is under inspection. The team is expected to show

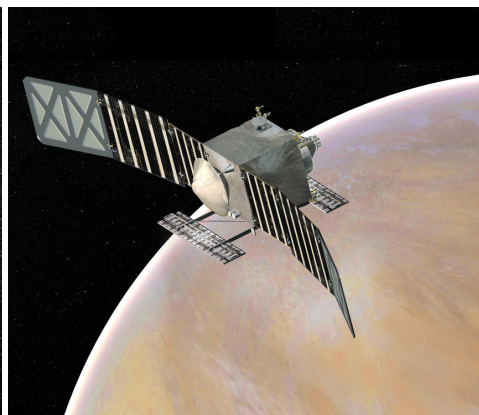
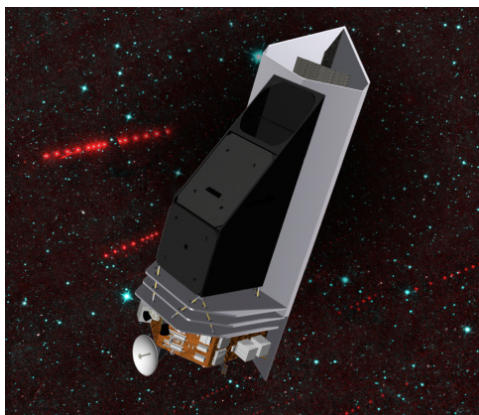
evidence that they've made progress and are mature in the design.”

Reviewers sometimes include experts from the aerospace industry or retired NASA engineers—even retired JPLers.

NASA's New Frontiers and Small Explorer programs also conduct site visits. SphereX, an all-sky infrared survey led by Jamie Bock of Caltech, just went through its own site visit for a Small Explorer opportunity recently. All of the presentations for the JPL-managed proposals are coordinated by the Innovation Foundry, partnered with the program directorates. The Foundry helps make sure all the JPL-managed teams are treated equally and have the same ground rules.

“Everybody's got great science at this stage,” Freeman said. “The science would be, by definition, selectable, and NASA would be pleased to do it. The key question is, what is your risk rating?”

Freeman expects a decision on the Discovery selection or selections in January.



JPL's Discovery Program proposals (from left): NEOCam, Psyche and VERITAS.

The JPL Way

By Franklin O'Donnell

After 27 years at the Lab working primarily on Mars missions, Richard Cook this summer was appointed JPL's Associate Director for Flight Projects and Mission Success. Here he discusses his role in Lab leadership and his plans for what he wants to accomplish.

Your job title calls out flight projects and mission success as your areas of focus. Would it be appropriate to call you “Mr. Execution”—looking at how JPL get things done?

That just about sums it up. Mike [Watkins, the JPL Director] has said he wants me to be the one responsible at the highest level for making sure that we achieve success on our missions. That involves me looking across everything we do—all of the projects in all the directorates—to make sure that we're following the right processes. We have been successful in the past because we followed the right recipe, and it is critical we do so in the future.

It is more difficult now, however, because of all the projects we are working on. Many years ago, the Lab would have one major project at any given time—a Cassini or a Galileo—and everything else was tiny, relatively speaking. Now we have four or five big projects and lots of smaller ones. That creates a lot of challenges—we have facilities and people constraints that require us to spend a lot of time optimizing how we do work. One of my roles is to resolve conflicts that come up and ensure that projects and directorates cooperatively use the resources that JPL has available.

The third major part of this job—which is probably the most important one—is working to understand and communicate the risks we're taking. We are in the business of pushing to do things that have never been done before, so it is crucial



Josh Krohn / JPL Photo Lab

we approach each launch and critical event with our eyes wide open. Doing so means that we must prize engineering excellence, promote openness, and support alternate perspectives. My job is to work with the projects, 3X and 5X to ensure we do that and provide an integrated view of the risks to Mike, NASA and Caltech.

To manage workload, you can hire more people, or send some work outside to industry. Are there other approaches?

Those are some of the tools. We're also trying to look for efficiencies in how we implement projects, trying to advance how we do work and innovate—essentially, trying to become more efficient.

Hiring people and sending work outside both come with challenges. When we bring in a lot of new people, we need to make sure that we have the right oversight. Not all are early career hires, many are mid-career people, but coming from

outside they don't necessarily know JPL's approach. So you have to have strong management in place. There are similar challenges when you send work outside. You still have to oversee the contracts and make sure the work gets done in the right way.

Is there anything you need from JPLers to make this work?

One of the things we've learned over time is that almost all failures can be tracked back to communications problems. As a flight project gets developed, some people may have concerns about technical issues, but for one reason or another that message doesn't reach the people who need to hear it. Communications problems have come up routinely when mishap boards have looked at mission failures.

So what I would say to everyone at JPL is that it's absolutely critical to get your

Continued on page 4

Fall tradition returns

Lab observes 80th anniversary with space-related Halloween show



Photos by Dutch Steger / JPL Photo Lab



Prize winners in JPL's Oct. 31 Halloween Fashion Show: First place: Lauren Denson as the Martian ambassador from the movie "Mars Attacks!" (top left); second place: Keri Bean (left), Melody Ho and Susan Bell modeling "Spacecraft Hats" (top right); third place: Veronica McGregor with the theme "Meteor Shower 2016" (bottom left). At bottom right are participants Robert G. Lee (as rebel pilot Luke Skywalker) and his 1 1/2-year-old son Tyrion Rex (TRex) as R2-D2.

News Briefs



Fred Hadaegh

Hadaegh new Chief Technologist

Fred Hadaegh has been named JPL's new Chief Technologist, replacing Jonas Zmuidzinas, who will return to Caltech as a physics professor.

Hadaegh, who had served as the Lab's Associate Chief Technologist since 2012, joined JPL in 1984 after receiving his Ph.D. in electrical engineering from USC, as well as bachelor's and master's degrees in the same subject from the University of Texas, Austin.

A JPL Fellow, Hadaegh previously supervised JPL's Guidance & Control Analysis Group, and led the development of guidance and control technologies for spacecraft formation flying, autonomous rendezvous and docking for NASA missions and Department of Defense programs.

Among his numerous awards are NASA's Exceptional Service and Exceptional Achievement medals.

Kudos for energy savings

JPL recently received two prestigious national awards in recognition of its energy-saving efforts.

The Department of Energy's Federal Energy Management Program 2016 award, which recognizes significant improvements in energy and water efficiency in government operations, was bestowed to NASA/JPL for the Clark Energy Group energy savings performance contract projects, which were managed by the NASA/JPL energy team. Receiving honors were NASA (Thomas Servilla), JPL (Steve Rigdon, Don Sciarrotta and Jim Quinn) and Clark Energy Group (Bryon Krug).

For the same project, JPL also won the Association of Energy Engineers 2016 Energy Project of the Year.

An awards ceremony is planned for December in Washington, DC.

Letters

Thank you to all my JPL co-workers and friends for the sympathy and condolences on the recent passing of my brother Eric. He had an artist's soul and will be truly missed by all of his family and friends and the beauty of the plant I received will remind me of him. He was always very proud of the fact that his little sister worked at JPL, and the support I have received during this time is the reason I am also very proud and thankful to work here.

Deborah Watson

Retirees

The following JPL employees recently announced their retirements:

October

Lawrence Zottarelli, 57 years, Section 348E; **Douglas Perry**, 25 years, Section 256F; **Andrew Thibodeaux**, 25 years, Section 220; **Stephanie Chong**, 19 years, Section 3918; **Dave H. Taylor**, 15 years, Section 252J.

September

Danny Low, 42 years, Section 2671; **Denis Elliott**, 41 years, Section 880A; **Clyde Bankston**, 38 years, Section 7600; **Elroy Akioka**, 38 years, Section 2662; **Harold Yorke**, 18 years, Section 3200.

COOK *Continued from page 2*

voices heard. If an engineer, or anyone, sees something that isn't right on a particular project they are supporting, they need to bring it forward. There are many, many mechanisms by which that can be done, starting with a person's group supervisor or the Project System Engineer or Mission Assurance Manager. JPL has a long history of examples where such communications resulted in fixing problems that would have led to mission failure. There have been a few cases where the institution decided to go ahead with the risk, but we did so with our eyes wide open. Both outcomes are vastly preferable to being surprised when a known but uncommunicated problem led to failure.

JPL historically has been risk-averse—building spacecraft in a way to make absolutely sure that they work—and in recent years there has been a call to develop some missions where more risk can be tolerated. Yet, we always want to succeed. Is that a contradiction?

It could seem that way. There is a big difference, however, between Mars 2020 and, say, a CubeSat that is carrying a low-cost instrument or doing a tech demo. We need to be able to accommodate both of those different type of products. Tech demos and other low-cost developments give us the opportunity to try out new technologies and development approaches that we would otherwise be unwilling to try. These types of efforts help keep us competitive and provide us opportunities to be as innovative in how we do things as what we do.

Do we want to take *reckless* risks on the things that are higher risk, however? No. We always want the thing we build to work, but we just need to be up-front about the risk of any given project. We can't pretend that a tech demo or small project is going to be as low-risk as Mars 2020 when it's clear that we don't have the resources to make that happen. So clarity of our expectations, and what we're promising, is critical.

Classifieds

Ads submitted Oct. 29 to Nov. 4.

For Sale

DESK, large, w/long drawer, all-wood construction, originally light wood stain, previous owner painted it rustic light green; 4' long x 29.5" deep x 30.5" tall, center-located sliding drawer 30" x 13" x 3.5" deep, removable legs; pictures available, can deliver in Pasadena area; \$85/obo. jackie.sly@gmail.com.

KITCHEN TABLE, round, dark wood stain, all-wood construction, 3' diameter x 3' height, comes with 2 dark-wood matching tall chairs. pictures available, can deliver in the Pasadena area; \$135/obo. jackie.sly@gmail.com.

MISC.: ski wear M/L/SL, mini steam iron, Rollerblades (men's 8), Bloody Mary set, stemless decanter set, ladies holiday dresses (10p, 12) & shoes (8-8.5), and board games. 818-272-3262.

Wanted

PIANO TEACHER for kids age 10 and 8; they are 2 years into serious piano lessons, but our teacher is joining the military and will not be able to continue with us. salvo_systems@yahoo.com.

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.

Real Estate for Sale

LEBEC-area mountaintop retreat, spectacular views, 4 br./2 ba., 3,210 sq. ft. custom-built house on 20 acres, surrounded by vast fields of wildflowers in spring, but stunning year-round; only about an hour from JPL north on I-5; includes spacious workshop or artist's studio; see <http://www.tourfactory.com/idxr1308594>; \$549,900. 805-358-1626 or Robert.A.Preston@icloud.com.

For Rent

ALTADENA (91001), furn. 2-bedrm., 2-bath home remodeled in 2012; ideal layout for roommates, bedrooms/baths at opposite ends of the house; refrigerator + microwave, plates, pots/pans, utensils, etc.; washer and dryer; gated parking in driveway and carport; nearest cross-st. is Fair Oaks/Calaveras; long- or short-term lease available; renter pays utilities excl. trash, \$2,000/mo., small pet acceptable for additional monthly fee. mpauken@gmx.com, 818-237-0645.

ALTADENA, unfurn. room in 3-bedrm/2-bath house, walking distance to JPL; all appliances included except dishwasher, garage and gated off-street parking; close to Old Town and Rose Bowl; prefer early career hire, someone who will keep common areas clean; preference to those looking to lease ASAP and/or for the next year; ~\$850/month, with 1 month security deposit, plus utilities. Jeff: 765-620-4342, jrstuart.realest@gmail.com.

ALTADENA, furnished rm. w/awesome view for lease; non-smoker to share a beautiful 4-bedrm, 3-bath house across from community garden; close to local colleges and Pasadena schools,

walk to JPL; utilities are included, central air/heat, internet access, near 210/134/110, bus stop, shopping, banking, entertainment and restaurants; \$800/month. 818-370-0601.

ALTADENA (91001), furnished loft w/awesome view for lease; non-smoker to share a beautiful 4-bedrm., 3-bath house across from community garden; close to local colleges, Pasadena schools, walking distance to JPL; utilities are included, central air/heat, internet access, near 210/134/110, bus stop, shopping, banking, entertainment and restaurants; \$740/month. 818-370-0601.

ALTADENA, looking for housemate to share 2,400- square-foot contemporary house in NE estate area, centrally located between Caltech & JPL; private bedrm. (furn. or not), shared bathroom, utilities, wireless internet, and full use of common areas (laundry, kitchen); \$575/mo. 626-797-4416.

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.

SAN MARINO, beautiful 4-bedrm., 3-bath Spanish Colonial in Mission District; cheerful living room with Fr. doors opening to patio, formal dining rm., lg. kitchen w/breakfast nook, separate laundry rm. w/washer & dryer; downstairs in-law suite + 3 bedrms. upstairs, including master suite w/attached bath & walk-in closet; central a/c and heating, dishwasher, oven, gas stove; 2nd bedrm. upstairs w/balcony overlooking back garden; hardwood floors, detached garage, quiet, secluded garden; walk to Lacy Park, 1 mile to Huntington Library, 2 miles to Caltech & S. Lake Ave. shops; in award-winning San Marino School District; \$4,950/month. 626-375-7266.

Vacation Rentals

JACKSON HOLE, WY: Luxurious bed & breakfast on 3 acres of solitude on Snake River near Jackson Hole Mountain Resort and Grand Teton Natl. Park; see <http://www.bentwoodinn.com/>; JPL discount. info@bentwoodinn.com, 307-739-1411.

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, Jacuzzis, grill, pool; no pets. <http://Courchevel6.com>.

MEXICO (1 bedrm.): Mayan Palace: Acapulco, Nuevo Vallarta, Riviera Maya, Puerto Vallarta; Sea Garden: Acapulco, Nuevo Vallarta, Mazatlan; trades available with II and RCI. 818-272-3262.



E-MAIL US AT
universe@jpl.nasa.gov

Universe

Editor

Mark Whalen

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