

Featured Stories

He brought his work home and saved a life



Neil Abcouwer with his wife, Aurelia, and son, Milo.

By: Taylor Hill
February 19, 2019

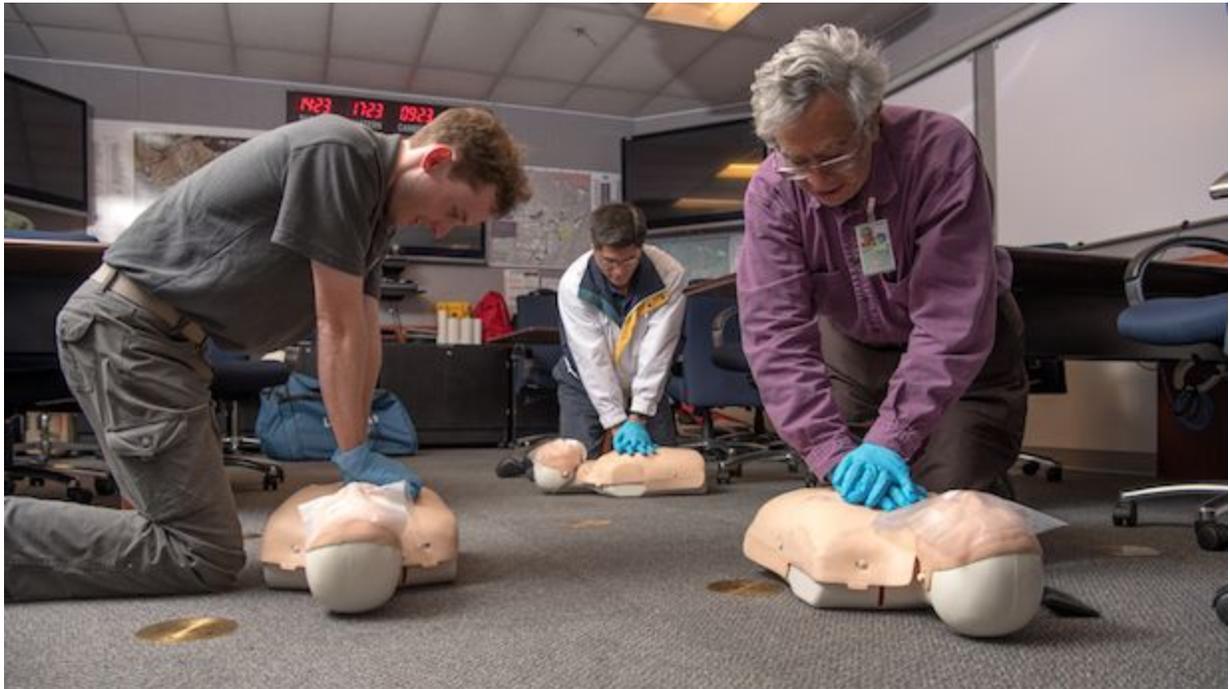
This past December, a parent's greatest terror visited robotics engineer Neil Abcouwer.

"It was an RDO Friday, and I was at home with my wife and our son, who's less than a year old," Abcouwer remembers, "Milo was taking his bottle like he has a hundred times before, but something went wrong, and he started choking."

In an instant, Milo was red and struggling to breathe. Neil's wife Aurelia called 911. Neil had taken the Lab's CPR course just weeks before. His training kicked in, and he immediately began the infant choking protocol he had practiced at JPL.

“It’s like a different version of the Heimlich maneuver,” Abcouwer said. “Based on what I remembered from the class, I took him and held him between my arms, belly down over my knee—head lower than his body—and gave him five backslaps. Then I flipped him over face up and started five chest compressions, similar to what you would perform for infant CPR.”

Abcouwer repeated the protocol for an excruciatingly long minute before Milo was able to clear his throat. By the time the paramedics arrived, Abcouwer said Milo was breathing normally and happy again.



CPR training class.

“We took him to the emergency room just to be safe, they checked him out and he was all good,” Abcouwer said.

For Emergency Preparedness Program administrator Silvia Villegas, hearing stories like Abcouwers’ makes her proud to be a part of the JPL emergency community.

“As a parent myself, the knowledge of CPR makes me feel at ease, but of course I hope I never to have to use it,” Villegas said. “Everyone in Protective Services was very happy to know that a fellow JPLer’s child’s life was saved by the knowledge and skills learned at our CPR training.”

At JPL, Abcouwer works on the climbing robot LEMUR (Limbed Excursion Mechanical Utility Robot), and often field tests the equipment among lava tubes and cave walls in remote parts of California and New Mexico.

“We’re required to have a member of the team take the safety training course, and it’s good to know first aid while you’re out there,” Abcouwer said, so he makes sure to recertify every two years. “And obviously, it’s good to just know these things in general.”



Firefighter Michael Prather shows an infant choking and CPR techniques during a training session.

Firefighter Michael Prather has been teaching CPR classes for JPL the past eight years, and is always encouraged when he hears stories like Abcouwer's.

"I was glad that he was able to put the knowledge into some real-world usage, and it made me feel proud that a student I taught was able to use these techniques and actually save a life," Prather said.

The course, titled Adult/Pediatric CPR /Automated External Defibrillator, is typically scheduled over two two-hours sessions on Tuesdays at Building 310-109. Participants receive hands-on training that provides the knowledge and skills to recognize and provide basic care for breathing emergencies, perform CPR for adults and infants, and use an automated external defibrillator (AED) for victims of sudden cardiac arrest, until medical personnel can take over.

The class is open to all JPL employees.

(Click [here](#) to learn more about CPR and defibrillator training available on-Lab.)

Building and floor wardens are required to take the course, along with first aid, fire safety, and fire extinguishers training.

"All staff that provide support in emergency response functions, such as emergency operations and management staff, are highly encouraged to take and complete these courses, which are all offered here at JPL," Villegas said.

For general questions about emergency classes and protocol at JPL, reach out to the Emergency and Continuity Management Group, at extensions 3-1523 and 3-2232.



(Video) Opportunity: NASA Rover Completes Mars Mission

To watch the video, please click [here](#).

Drive along with NASA's Opportunity Mars rover and hear the voices of scientists and engineers behind the mission. Designed to run for 90 days, the exploration spanned more than 15 years from 2004 to 2019. Along the way, it discovered definitive proof of liquid water on ancient Mars and set the off-world driving record.

Transcript:

- We have positive confirmation of a safe landing.

- We're seeing it on the LCP.

[wild celebration]

[indistinct chatter]

John Callas: Opportunity hit a hole-in-one when she landed. The airbag system rolled into this small crater called Eagle crater. And when the rover first turned on its cameras, it saw that the rim of this small crater was lined with exposed bedrock.

Steve Squyres: So, we took out our microscope for the first time and we took a picture and the surface of Mars at that location is littered with an uncountable number of little round things...

Abigail Fraeman: ...that were called blueberries because they looked like blueberries in a muffin. What we discovered was that those are features that form in water and they were a really definitive sign that there

had been liquid water on the surface of Mars some time in the past.

Callas: You know, after we left Eagle crater we went to Endurance crater and that's the crater we drove down in. And there we did the what the geologists call an in sequence stratigraphic section, which is essentially reading the chapters of the Martian history book in reverse order.

Matt Golombek: That rover became a stratigrapher. First time we had a stratigrapher on Mars. We knew we wanted to go after Endurance to Victoria.

Callas: We put the pedal to the metal, and we started heading there, tens of kilometers away. We had to literally surf across these dunes of windblown material, and the rover got stuck in one of those. We had to get the rover unstuck. What we found is the best way to get it out is just to put it in reverse and gun it. The rover eventually popped out. And, so we changed our driving strategy. So we recognized these ripples as hazards. We get to this giant half-mile diameter crater-- Victoria crater--and we want to figure out, "Gee, how can we go into this thing?"

Golombek: All of a sudden, we got HiRISE images. We could see the rover in the image.

Squyres: That was the very first image that we got from space showing one of our rovers.

Golombek: We spent a year scouting the edge of that crater to decide where we wanted to go in to get the best stratigraphic section.

Callas: We found a place to go in, and we drove down in and we spent about a year inside Victoria crater.

Heather Justice: The science team was really excited about the idea of driving to Endeavor Crater...over 20 km away. This is a long drive to do. It was gonna take multiple years, but they decided to do it anyways.

Callas: There were too many of these dangerous ripples in our way, and we actually had to take this circuitous route that at times took us away from the crater only to then cut back and then approach it more directly.

Justice: And then we pull up to Endeavor crater and all of a sudden there's all these new things to look at.

Fraeman: We first discovered the Homestake vein. It was this very, very bright linear feature. It turns out that it was a big gypsum vein, and we see these gypsum veins now all over. So, it was our first taste of what is a really important process on Mars.

Justice: We were driving to a valley and along the way there we realized that right about the point where we were about to get to this valley, that was when we were gonna cross the marathon mark. So we said, "well, that's cool, we're just going to name this valley after that, call it Marathon Valley." That was when we reached the distance of a marathon, 26.2 miles, on another planet. We continued driving through some slopes down, a little bit on the interior of the crater rim until we came back out so that we could continue onto the next valley, Perseverance Valley...

Golombek: ...where the rover was exploring when we lost contact.

Fraeman: We said, "We're gonna operate this vehicle until the day where we can't," and that's exactly what we did, and I'm really proud.

Callas: We've set a foundation that will serve as the basis for future exploration.

InSight lands praise and a proclamation from LA County



L.A. County Supervisor Kathryn Barger presented the award to the InSight team, represented by (l to r) Chuck Scott, Tom Hoffman, [Kathryn Barger], Bruce Banerdt, Pilar Leon, Christine Szalai. (Photo by Patty Rhee)

By: Jane Platt
February 25, 2019

Several members of the Mars InSight team accepted a proclamation on behalf of the mission from L.A. County Board of Supervisors on Tuesday, Feb. 19.

"I've always wanted to say this: 'mission accomplished.'" That's how Fifth District Supervisor Kathryn Barger began the presentation. She said, "I want to thank the incredible team at JPL who has gone above and beyond to really propel Los Angeles County into the future as a leader in science and technology."

InSight Project Manager Tom Hoffman noted that although all five team members present at the ceremony live within Barger's district, the team includes people from all over L.A. County, other states, and other countries. Hoffman said he was proud to represent all of them.



InSight team photo, taken in January on the steps of Bldg. 180. (Photo by Ryan Lannom)

"It really takes more than a village to build a spacecraft, it takes an entire planet, to build this particular spacecraft," Hoffman said.

Watch the proclamation ceremony, starting at 44:44, at:

http://lacounty.granicus.com/MediaPlayer.php?view_id=1&clip_id=6038

SPHEREx builds a winning proposition



SPHEREx team photo

By: Jane Platt
March 4, 2019

When he was summoned to a JPL office on Feb. 13, scientist Jamie Bock saw Caltech President Thomas Rosenbaum, NASA Associate Administrator for the Science Mission Directorate Thomas Zurbuchen...and a video camera.

The thought tumbling through Bock's head was, "Well, they probably wouldn't be going through all this trouble if they were telling me our mission was not chosen."

His instinct was correct. The scene was set up for them to tell Bock that NASA had selected the SPHEREx concept, which he had labored on for years, as an official mission. Bock viewed it as "a thoughtful gesture and a symbolic way to kick off a new mission right after Mars Opportunity officially ended."

SPHEREx, targeted for launch in 2023, is a small telescope with big goals, designed to tackle fundamental astrophysics questions that have sparked human curiosity for eons. Specifically, it will probe what drove the birth of the universe, how galaxies formed and developed, and how ice-borne interstellar water and biogenic molecules evolved in the early stages of star formation.

Right concept seeks committed proposal partner

The birth of the SPHEREx mission was considerably less mysterious than the formation of the universe, but it was a complex and lengthy process involving a hard-working, innovative team that focused on strong proposal writing.

"Every great mission starts with a great proposal. We're grateful for the hard work and dedication of the

SPHEREx proposal team,” said Dave Gallagher, the Lab’s associate director for strategic integration. “Their efforts combined high energy, diverse thinking, and exposure to multiple technical areas. The experience can be highly rewarding, and I encourage JPLers to use their knowledge and talents in support of future missions.”

Jeff Booth steered development from the beginning, collaborating with Bock and others on the engineering design. Bock says Booth also was instrumental in crafting the right messaging, which “took a lot of patience with scientists unfamiliar with the craft of proposal development.”

Keith Grogan shepherded the team through various checkpoints to get input from multiple perspectives, anticipating how NASA reviewers would perceive the proposal.

Before the proposal that led to the selection of SPHEREx, Jenn Rocca was project system engineer for an earlier version of the mission as a SMEX proposal. Although that proposal was selected for Step II, it ultimately was not chosen for implementation. When it morphed into the successful MIDEX proposal, Rocca adopted the additional duty of capture lead, whose job is to develop a winning proposal.

“Amusingly, the one piece of advice we received from the winner of a past proposal was don’t let your system engineer take on the additional job of capture lead—it’s too much for one person,” Bock said. “But she did a great job in her role, making it look easy.”

Bock also called out Project Scientist Olivier Dore for doing an exemplary job honing the case for science, organizing the team, and holding two public workshops to get input from the science community.

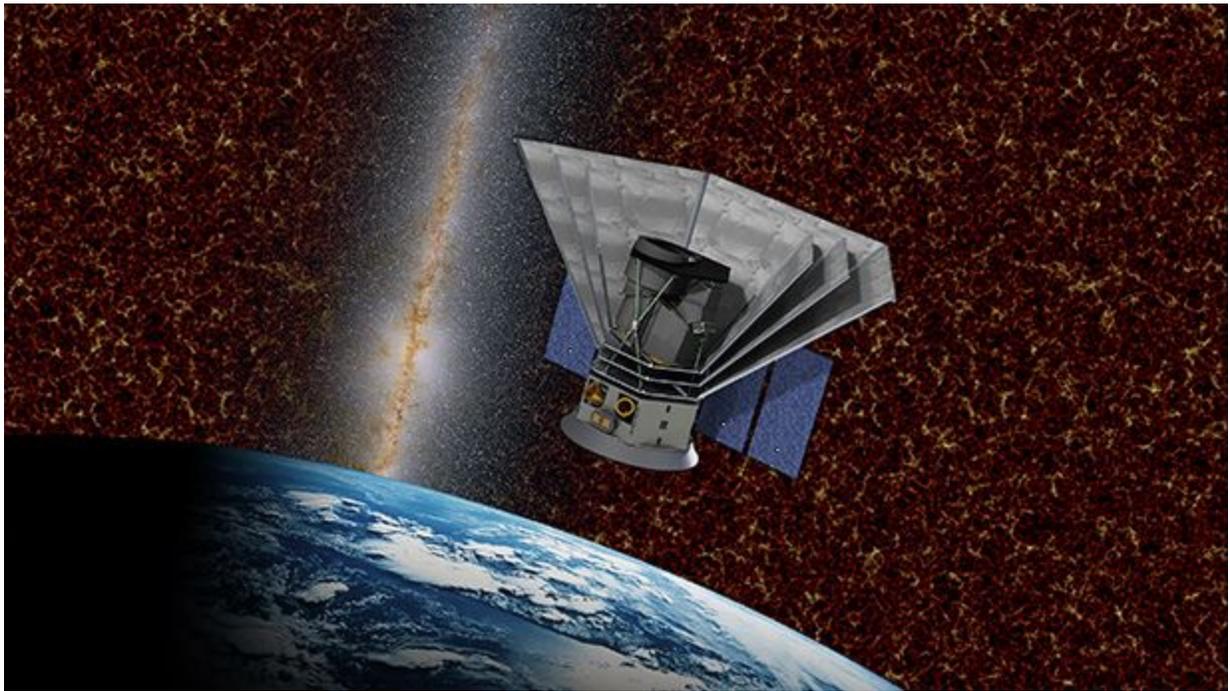
Proposal partner seeks right concept

Bock offered some advice for others involved in a proposal process.

“There’s no substitute for getting the right concept, and it is easy to fall into the trap of letting the process take over. The tight integration between the design and science objectives was the key to honing both the science and engineering. Then we used the formulation process to the full extent to get that message across in the proposal and site visit,” Bock said.

He acknowledged that the proposal process can be discouraging at times, especially during the inevitable criticism from internal peer reviews. “It takes a while to figure out how to defuse a potential weakness.”

A good proposal team also needs to know how to accommodate and resolve disagreement. Bock said, “All of the big decisions I can think of ended up being unanimous in the end. I changed my mind on a few of these, and everyone has to listen. On smaller decisions, we didn’t necessarily get full agreement, but at some point leaving the decision unresolved is the worst option.”



SPHEREx artist concept

SPHEREx, the prequel: if at first you don't succeed, try again

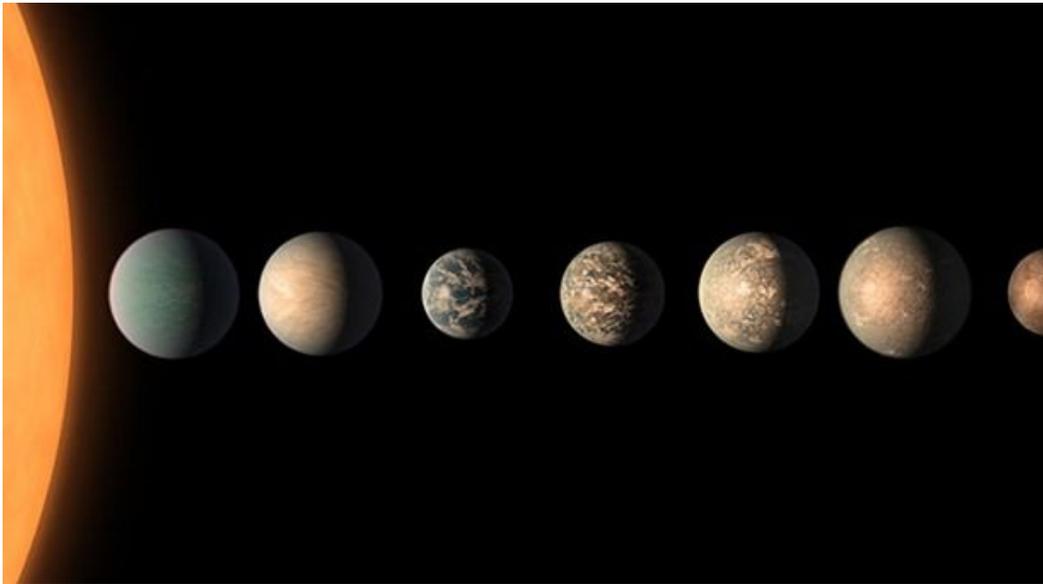
SPHEREx began life in 2014 with a small JPL internal investment aiming to develop Small Explorer-class (SMEX) ideas from a beginning stage. In an accidental nod to the premise that great minds think alike, three separate groups submitted ideas with near-infrared spectroscopy, connected with the early universe, galaxies, and interstellar ices. Spitzer Project Manager Michael Werner suggested they team up to combine their ideas into a single mission.

Bock, who splits his time between JPL and Caltech, said the main challenge was that the instrument and telescope mass and volume were limited by the SMEX guidelines, but needed adequate spectroscopic sensitivity. All the conventional spectrometer designs the team explored didn't remotely fit. The innovative solution: simple interference filters placed over the focal planes to perform spectroscopy by using the spacecraft's pointing system to capture multiple images. Jim McGuire designed a wide-field telescope that meshed with the concept.

SPHEREx did not make the cut for the SMEX opportunity. But while that process was winding down, the team jumped at another chance when a MIDEX Announcement of Opportunity came up. "Fortunately, we had a pretty mature approach by that point, so we could react quickly," Bock said. Most of the players from the SMEX effort returned, providing a seasoned team for the winning MIDEX proposal.

Key writers on the SPHEREx proposal were: Jennifer Rocca, Steve Unwin, Jamie Bock, Olivier Doré, Allen Farrington, Phil Korngut (Caltech), Konstantin Penanen, Theresa Kowalkowski, Mike Fong, Brenden Crill, Sara Susca and Peter Basch.

Events



von Karman lecture: The golden age of exoplanet exploration

Thursday, March 14 at 7 p.m. in the von Kármán Auditorium

Friday, March 15 at 7 p.m. in Caltech's Ramo Auditorium

Host:☒

Preston Dyches

Speakers:

☒Jessie Christiansen, Research Scientist at the NASA Exoplanet Science Institute, Caltech☒

Karl Stapelfeldt, Chief Scientist, NASA Exoplanet Exploration Program, JPL

Since the discovery of the first exoplanet orbiting a sun-like star in 1995, several thousand more have been discovered. We've peered into the atmospheres of some, and we've found whole families of planets orbiting strange stars -- many in configurations starkly different from our own. We've learned a lot from NASA's Kepler mission, which launched 10 years ago and ceased operations in November 2018. A new NASA planet-hunting spacecraft called TESS, which began science operations as Kepler was winding down, will give us thousands of new discoveries in the coming years. And the Spitzer Space Telescope has provided us valuable insights into what these worlds might be like. This show will look at the state of exoplanet science and give us a view of what future discoveries may be around the corner.



TIAA Webinar: Responsible Investing

Wednesday, March 13

9 a.m. - 10 p.m.

Reserve your spot for the webinar by registering at tiaa.org/webinars

During this TIAA webinar, you will learn about Responsible Investment (RI), how the RI industry has evolved over the years, current trends driving its growth, and ways for you to consider incorporating RI practices into your investment strategies.

Webinars will also be available on-demand for 30 days.



Market-proof Your Retirement with TIAA Traditional

Thursday, March 14

9 a.m. - 10 a.m.

Reserve your spot for the webinar by registering at tiaa.org/webinars

During this TIAA webinar, learn how to create a plan that protects you against key retirement risks, and how to help build a diversified retirement income plan.

The webinars will also be available on-demand for 30 days.

JPL Family News

Retirees

The following JPL employees recently announced their retirements:

The following JPL employees recently announced their retirements:

Ben A Parvin, 39 years, Section 7050; **Benya Ridenoure**, 27 years; **Bryan L. Allen**, 18 years, Section 393G; **Carmen Vetter**, 39 years, Section 4020; **Hope Norton**, 38 years, Section 3513; **Karl C. Bird**, 12 years, Section 2600; **Paul V Hardy**, 34 years, Section 313Z; **Robert Thurstans**, 31 years, Section 329D; **Ross M Jones**, 40 years, Section 3100; **Sharmon Keasler**, 20 years, Section 1710; **Winnie Wang**, 19 years, Section 1630; **Young H Park**, 40 years, Section 4200

Letters

Thank you so much again for the beautiful plant, this time for the passing of my dear father. I very much appreciate JPL's kindness and understanding during this time.

--**Andrea Donnellan**

Passings

Clifford J. Finnie, 87, died on Nov. 21, 2018. He worked at JPL for more than 39 years, most recently as a senior engineer in the Communications elements research section quantum electronics group. Finnie is survived by his wife, Barbara Finnie.

Awards

The National Academy of Engineering has elected JPL Engineering Fellow **Miguel San Martin** to be a member of the organization. Election to the Academy is considered one of the highest professional distinctions accorded to an engineer.

San Martin was selected "For technical contributions and leadership in guidance, navigation, and control leading to successful Mars entry, descent, and landing" of Mars Science Laboratory in 2012.

Academy membership honors 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."

Individuals in the newly elected class of 86 members and 18 foreign members will be formally inducted at the Academy's annual meeting in Washington on Oct. 6.

San Martin's path to JPL began in his native Argentina, where he was inspired by the Apollo and Viking missions. He left to pursue university studies and follow his dream of contributing to space exploration by working for NASA. He earned his bachelor's degree in electrical engineering from Syracuse University, and his master's degree in aeronautics and astronautics engineering from MIT.

After graduation, he joined JPL, where he was part of the Magellan mission to Venus and the Cassini mission to Saturn. He has been an important part of several Mars missions—first as chief engineer for the guidance and control system for the 1997 Pathfinder mission, which landed Sojourner, the first robotic vehicle to land on Mars. He then assumed the same role for the Mars Exploration Rover mission that landed Spirit and Opportunity in 2004.

San Martin was the chief engineer of guidance and control for the Mars Science Laboratory, which successfully landed Curiosity on the surface of the Red Planet on August 5, 2012. He was a co-architect of Curiosity's innovative SkyCrane landing architecture and also served as the deputy chief for entry, descent, and landing. For his contributions, he was named JPL Fellow in 2013 and received the NASA Exceptional Engineering Achievement Medal.

San Martin is currently the Chief Engineer of the Guidance and Control section at JPL, participates in several advanced studies, and is a member of several JPL and NASA review and advisory boards.