What are the odds?
Ulysses meets Hyakutake

By J. Platt

The Ulysses spacecraft unexpectedly passed through the tail of Comet Hyakutake, above.

Gavin named to head new directorate; Naderi will lead Mars program

JPL Director Ed Stone has announced the appointment of Tom Gavin to the position of director for Space Science Flight Projects (400), and Dr. Firouz Naderi as manager of the newly created Mars Program Office at JPL.

Gavin has been the deputy director for Space and Earth Science Programs since 1997. He received his bachelor of science degree in chemistry from Villanova University in 1961 and joined JPL the following year to work on the Mariner Project. He was the mission assurance manager for both the Voyager and Galileo Projects. In 1990, he was appointed spacecraft system manager for the Cassini mission and remained in that position until the successful launch of the spacecraft in 1997.

Gavin received NASA’s Exceptional Service Medal in 1993 for his work on Voyager, NASA’s Medal for Outstanding Leadership in 1991 for Galileo, and NASA’s Outstanding Leadership Medal in 1999 for Cassini. In 1997, he received the Aviation Week and Space Technology magazine’s Laurels Award for outstanding achievement in the field of space.

Naderi had been the manager of NASA’s Origins Program since 1996. He joined JPL in 1979 and has served as program manager for space science flight experiments and project manager for the NASA Scatterometer project. In addition, he was program manager at NASA Headquarters for the Advanced Communications Technology Satellite program and at JPL for the Mobile Satellite program.

Of his new position, Naderi noted, “With a program of this complexity, the challenge is half technical and half sociological. My office will need to make sure the interfaces between JPL, NASA Headquarters and outside industry work extraordinarily smoothly.”

Within JPL, he stressed the need for cohesion between the Mars program and other organizations, particularly the new Space Science Flight Projects Directorate.

Naderi noted the importance of “shared expectations” with Scott Hubbard, the new Mars Program director at NASA Headquarters. Hubbard will oversee the development and implementation of the long-term strategy for the robotic exploration of Mars, as well as for the programs architecture and management of related funding.

Naderi’s office will serve as the single point of contact for NASA Headquarters at JPL for all Mars exploration efforts.

A native of Iran, Naderi holds three degrees in electrical engineering: a bachelor’s from Iran State University and a master’s and doctorate from USC.

Directors reorganize; deputys named

Concurrent with the appointments of Gavin and Naderi, three JPL managers have been named deputy directors.

Larry Simmons, program manager for the Space Infrared Telescope Facility (SIRTF), retains that position and has been named deputy director for Space and Earth Science Programs. Simmons will also serve as acting manager of the Origins Program.

Chris Jones, former manager of the Mars Surveyor Program Office, has been named deputy director for Space Science Flight Projects, and Telecommunications and Mission Operations Directorate (TMOD). Program Manager Richard Coffin has been appointed deputy director for TMOD.

In light of the recent announcement that operations management for space science missions will be carried out by TMOD, the following organizations have been transferred from the Space and Earth Science Programs Directorate to TMOD:

• Mars Surveyor Operations Office (701) is renumbered 907.
• Stardust Project Office (755) is renumbered 908.
• Deep Space One Project Office (756) is renumbered 909.

In addition, a number of operations have been transferred from the Space and Earth Science Programs Directorate into the new Space Science Flight Projects Directorate (400):

• X2000/MDS Integrated First Delivery Project Office (751) is renumbered 460.
• Outer Planets/Solar Probe Project Office (752) is renumbered 470.
• Mars Surveyor 2001 Project Office (754) is renumbered 410.
• Mars Micromissions/Mars Network Project Office (757) is renumbered 440 and renamed Mars TeleSat Project.
• Genesis Project Office (758) is renumbered 480.
• Deep Impact Project Office (759) is renumbered 490.
• Space Infrared Telescope Facility (SIRTF) Project Office (762) is renumbered 450.
• Galaxy Evolution Explorer (GALEX) Project Office (768) is renumbered 406.
• Muses-CN Project Office (7961) is renumbered 405.

Did Hyakutake and Naderi lead the odds?

Ulysses Project Scientist Dr. Edward W. Smith of JPL, the co-investigator for its magnetometer instrument. Before the unexpected encounter, Ulysses was hundreds of millions of kilometers away from Comet Hyakutake and far beyond the visible tail.

“This tail extends half a billion kilometers (more than 300 million miles). That’s more than three times the distance from the Earth to the Sun,” said Dr. Nathan Schwadron of the University of Michigan, a member of one of two Ulysses teams that made the discovery independently of one another. Findings from both teams appear in the April 6 issue of the journal Nature.

“This makes it the longest comet tail ever recorded,” said Dr. Geraint Jones from Imperial College, London, of the Ulysses magnetometer team.

Comet Hyakutake, one of the brightest comets of the 20th century, made a distant nighttime appearance in the spring of 1996, when it made a close pass by the Sun. While Ulysses was cruising through space studying the solar wind on May 1, 1996, its data suddenly went wild for a few hours. For example, the solar wind seemed to almost disappear and was replaced by gases not normally found in the solar wind, and the magnetic field in the solar wind was distorted. Since Ulysses scientists were not looking for comets, they did not realize the significance of the data right away.

“The discovery was made quite by accident, a bit like finding a needle in a haystack when you weren’t even looking for a needle in the first place,” said Dr. George Collmer of the University of Maryland, principal investigator of the Ulysses solar-wind ion-composition spectrometer team. The instrument studies the content and electrical charge of ionized gases. While his team detected ions typically found in comets, the magnetic field orientation is observed magnetic field directional changes like those associated with comet tails.

Comets are of great interest, because they may be the frozen leftovers of the birth of our solar system. They could hold clues to the formation of Earth and life, since one theory holds that comets “seeded” Earth and other planets with the building blocks of life.

Comets are made of dirty ice, and as they approach the Sun and heat up, they emit gas and dust, forming gas and dust tails. The gas slows the solar wind and the portion of the magnetic field near the comet. The parts of the magnetic field farther from the comet continue to travel rapidly past it. Magnetic fields can be stretched like rubber bands. The magnetic field is draped around the comet and stretches out behind it in a hairpin shape.

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By Jane Platt
Terrestrial Planet Finder is planned for launch in 2012. Over a five-year period, it will take a look at 250 stars to determine which ones may harbor life-sustaining planets.

The orbit that can potentially support life. Held at 7 p.m. in the Forum at Caltech, Colorado Blvd. Open to the public.

The special events calendar contains information on events that are open to the public. The events include talks, lectures, concerts, and other activities at JPL.

The special events calendar is updated regularly, so it is a good idea to check back frequently to stay up-to-date on the latest events. The events are organized by date, so you can easily find upcoming events at a glance.

In addition to the special events calendar, you can also find information about JPL's educational programs and opportunities to visit the facility. This is a great way to learn more about the exciting work being done at JPL and to connect with the team of scientists and engineers who are pushing the boundaries of knowledge.

Monday, April 27

Caltech Architectural Tour — The Caltech Architectural Tour takes visitors on a guided tour of the campus, highlighting the unique architecture and engineering of the buildings. The tour begins at 11 a.m. and lasts about 90 minutes. It is free and open to the public.

Thursday, April 27

Remote Access — Bill Watts of Section 366 will discuss how to get the most out of dual and virtual private network access services to JPL. The network access service handles more than 25,000 sessions and 1.5 million online minutes per month for its 2,700 users. Held at noon in Kärman Auditorium.

Thursday, April 20

P.J. Astronomical Club — Meeting at noon in Building 207-117. “The Importance of Fatherhood in Our Culture” — Rick Kidd, a Sierra Madre-based marriage and family counselor who specializes in the needs of school-age children, is the school counselor at St. Marks Elementary School in Altadena. He will speak at 12:15 in Building 172-117.

Karrmann’s Lecture Series — Dr. Michael Shao will describe the Space Interferometry Mission, whose scientific goal is to find new planets that are about the size of the Earth and in an orbit that can potentially support life. Held at 7 p.m. in the Karman Auditorium.

Saturday, April 15

Ratified Bands — The Scottish band will perform Celtic music using a blend of bagpipes, guitar, citterns, synthesizer, fiddle and vocals. Held at 8 p.m. in Caltech’s Beckman Auditorium. Tickets are $25, $21 and $17. Call 362-4952 and 4951.

Sunday, April 16

Chamber Music — The Skampa Quartet and baritone Christopheren Normura will perform at 3-30 p.m. in Kärman Auditorium. Tickets are $25, $21 and $17. Call 362-4952 and 4951.

Tuesday, April 18

Help for Caregivers of the Elderly — Adria Erbstone at the Huntington Hospital Senior Care Service will discuss how to assess, plan and manage the needs of the family member; caregiver responsibilities; family relationships and how to care for yourself while caring for the senior in your life. To be held at 11:30 p.m. in von Kármán Auditorium. The talk is hosted by JPL’s Employee Assistance Program, which is also interested in starting a monthly senior caregivers’ support group at the lab. Call Adria at 362-4860.

Investment Advice — Fiduciary representative Jason Rasmussen will hold a workshop on the basics of investing from noon to 1 p.m. in the lab’s cafeteria’s northeast corner. Included will be a broad overview of the financial markets, basic investment building blocks such as stocks, bonds, mutual funds and annuities, basic terminology and concepts and hands-on exercises. Rasmussen will also be available for one-on-one counseling. To schedule an appointment, contact Jason Rasmussen at ext. 4-1133.

Retirement Information — Cindy Wilson of TIAA/CREF will conduct an information meeting for all employees who have completed or will soon complete their eligibility requirement for the plan, or planning to participate, or for new hires eligible to join the retirement plan. Assistance in completing applications and investment option information will be available. To be held at noon in Building 172-117.

Wednesday, April 26

The group will sponsor Commuter Benefit Night at 5:30 p.m. in the cafeteria’s Davey Lounge. Tickets are $12 for adults, $4 for children under 12. Call 362-4953 and 4952.

Monday, April 24

Women and Investing — Certified financial planners Sharon and Kenneth Mardji will present an overview seminar at noon in the Building 167 conference room. Sponsored by the Director’s Advisory Council for Women.

Wednesday, April 26

For more information, contact Dutra at ext. 4-9425.

For more information, contact Adria Erbstone at ext. 4-3319.

For more information, contact Kassaie at ext. 4-9425.

For more information, contact Laurel Joch at ext. 4-9425.

For more information, contact Kassaie at ext. 4-9425.

For more information, contact Mary Sue O’Brien at ext. 4-5090.

For more information, contact Gluck at ext. 4-9425.

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For more information, contact Peter Gluck at ext. 4-9425.

For more information, contact Mary Sue O’Brien at ext. 4-5090.

For more information, contact Cindy Cooper at ext. 4-3319.
A team of JPL and other atmospheric researchers just back from an international science expedition to study atmospheric ozone in the Arctic reports that ozone losses of more than 60 percent occurred in the Arctic stratosphere this winter (1999-2000), one of the coldest winters on record.

The NASA-sponsored SAGE III Ozone Loss and Validation Experiment (SOLVE) was motivated in part by concerns that the increase in the amount of greenhouse gases might lead to a cooling of the polar lower stratosphere, which could lead to more frequent polar stratospheric clouds and enhanced ozone depletion. Data collected by the research team will greatly improve scientific understanding of the role of global temperature change in the destruction of ozone.

The Earth’s ozone layer protects Earth’s life from the harmful effects of the Sun’s ultraviolet radiation. Chemicals used in refrigerants, aerosol propellants and plastic foams were discovered in the 1970s to be destroying Earth’s ozone layer. Since that time, production of the most harmful chemicals has been limited or halted in an effort to stop the destruction of the ozone layer.

The satellite, launched Dec. 20, 1999, is in a Sun-synchronous orbit at an altitude of about 695 kilometers (429 miles). It measures “solar irradiance,” or the total amount of the Sun’s energy from the Sun was not a constant. However, the solar variability was so slight (0.1 percent) that computer simulations suggest this cooling mechanism should only have a small effect on the polar stratosphere.

Recent research suggests that circulation changes in the stratosphere, perhaps related to the build-up of greenhouse gases, may be responsible for the recent spate of cold Arctic winters. “The polar stratospheric clouds covered a larger area, and persisted for a longer period of time, than for any other Arctic winter during the past 20 years. These conditions heighten our concern regarding possible couplings between climate change and stratospheric ozone depletion,” said JPL ozone researcher Dr. Ross Salawitch. Even as the amounts of stratospheric chlorine and bromine decline, “the chemical depletion of Arctic ozone would still be prolonged if temperatures in the Arctic continue to decline.”

The new findings bolster views that the ozone layer is sensitive to temperature as well as ozone-deestroying chemicals.

The U.S.-sponsored team joined with a European Union-sponsored Third European Stratospheric Experiment on Ozone to obtain measurements of ozone and other atmospheric gases and particles using satellites, airplanes, balloons and ground-based instruments. JPL and Caltech instruments were used on each of the high-altitude balloon and aircraft platforms. Most of the measurements were made near Kiruna, Sweden with additional measurements made from a network of stations at mid- and high- northern latitudes. Observations obtained from JPL’s Microwave Limb Sounder satellite instrument provided a global perspective.

New images from JPL’s Mars Global Surveyor may help scientists understand what materials make up the exotic, multi-layers of the South Pole. Scientists theorize that the thickness and the composition of the layers in Mars’ south polar region could hold a record of climate change in a way that is similar to how years of drought and years of plentiful rain change the width of rings in a tree trunk on Earth. The layers may be made up of frozen carbon dioxide, water ice and fine dusts that have been eroded over time. Mars Global Surveyor images are available at http://www.msss.com.