Earth science for the NASA AIRSAR System.

Rapid-Repeat Deformation

Four JPL

Earth science concepts funded

The instrument joins another satellite already in orbit to measure wind speed and direction over Earth's oceans.

SeaWinds, which rides aboard the National Space Development Agency of Japan's Advanced Earth Observing Satellite 2 (Ades 2) spacecraft, will complement and eventually replace a second, identical instrument that has been orbiting since June 1999 aboard NASA's Quick Scatterometer (QuikScat) satellite. Its three- to five-year mission will augment a long-term ocean surface wind data series that began in 1996 with the launch of the NASA Scatterometer aboard the Ades 2 spacecraft. The Japanese Space Agency is a partner on SeaWinds, along with the National Oceanic and Atmospheric Administration (NOAA).

Climatologists, meteorologists and oceanographers use these detailed snapshots of ocean winds in conjunction with data from other Earth-monitoring satellites from NASA and other U.S. and international entities to understand and predict severe weather patterns, climate change and global weather abnormalities like El Niño.

SeaWinds on Ades 2 will maintain a circular, near-polar orbit about 800 kilometers (500 miles) above Earth. Initial telemetry reports received from the Ades 2 team show the spacecraft to be in excellent health. The SeaWinds instrument will be powered on 27 days after launch and 17 days later will undergo a thorough checkout. A six-month calibration/validation phase will begin in mid-April, with nominal science operations scheduled to begin in October 2003.

"Winds effectively 'see' heat, moisture and greenhouse gases interacting between Earth's oceans and atmosphere, driving ocean circulation and ultimately weather and climate," said Dr. Ghassam Asrar, associate administrator of NASA's Office of Earth Science. "Ground-based methods of monitoring winds using ships and buoys can only provide a glimpse of this picture, whereas space-based microwave radars like SeaWinds can continuously and accurately map wind speed and direction under most weather conditions across 90 percent of Earth's ice-free oceans every two days.

"In addition," Asrar said, "since SeaWinds maps Earth's land masses as well as its oceans, its data are being used in an increasing number of other applications, from production of daily maps of sea ice extent around Earth's poles; to measuring soil moisture content, vegetation and snow cover; to detecting regional flooding."

"With its ability to 'see' ocean level winds through clouds, data from SeaWinds on Ades 2 will be an invaluable tool for hurricane tracking and high seas marine forecasting," said Helen Wood, director of NOAA's Office of Satellite Data Processing and Distribution. "NOAA will quickly process the data for weather forecasting use by NOAA's National Weather Service, the Japanese Meteorological Agency, and other national weather agencies around the world."

Scatterometers operate by transmitting high-frequency microwave pulses to the ocean surface and measuring the "backscattered," or echoed, radar pulses bounced back to the satellite. The instrument senses ripples caused by winds near the ocean's surface, from which scientists can compute wind speed and direction. Additional information about SeaWinds is available at http://winds.jpl.nasa.gov.

J PL 101 quiz will test your knowledge

Q: Where is the Carl Sagan Memorial Station?
   a) Ares Vallis, Mars
   b) JPL Mall Wall
   c) Aboard the Voyager spacecraft

(Answer below)

How much do you really know about the people, events and accomplishments that have shaped the history of the Laboratory? A new and fun way to find that out will be made available online beginning on Monday, Jan. 13.

"JPL 101" will be featured on the Lab's internal news site, the Daily Planet (http://daily-planet), and will include a new five-question quiz every week. The questions and answers in "JPL 101" are based on information that challenges the seasoned JPLer, while informing the new hire. The Q & A's cover a broad array of information and are intended to help people gain understanding about areas where they may not have direct work-related exposure.

The questions are in seven categories: JPL Basics, Science, Technology, Product Development, Missions, Stakeholders, and JPL History. The answers contain supplemental information that encourage further exploration of JPL resources. The quiz is intended as a general educational resource for the use of all Laboratory personnel.

People are encouraged to share their knowledge by submitting questions and answers for inclusion in future quizzes.

The J PL 101 quiz was developed by the Knowledge Capture Team through the IGES Knowledge Management Program, with the assistance of the Internal Communications Office, JPL Library, Human Resources, and Ethics Offices. For more information, contact Rebecca Nash, ext. 4-1752, or Lynne Cooper, 3-3080.

JPL 101 quiz

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(Answer below)

Four J PL earth science concepts funded

Four JPL-led investigations are among the nine award-funded by NASA last month for technology development of innovative Earth science remote sensing instruments, under the Instrument Incubator Program, to support the mission to understand and protect our home planet.

Investigations led by JPL researchers Scott Hensley (Rapid-Repeat Deformation Measurement Capability for the NASA AIRSAR System), Ziad Hussein (Cryospheric Remote Sensing, SeaWinds launches from Japan’s Tanegashima Space Center on Dec. 13.

SeaWinds launches from Japan’s Tanegashima Space Center on Dec. 13.

The main purpose of the Instrument Incubator Program is to invest in research and development of new and innovative technologies to support the NASA Earth Science Enterprise goals and objectives. The program focuses on creating mature technologies leading to smaller, less resource-intensive and less expensive flight instruments that can be built quickly and efficiently. The nine selected proposals focus on high-priority measurement areas of Earth’s coastal region; Earth’s interior processes and motions; sea ice thickness and snow cover; pollution effects; and precipitation, evaporation and cycling of water. A proposal also focused on innovative technologies supporting measurement concepts from the L1 or L2 Lagrangian points (the points in space where the opposing pull of the Earth reduces the effective pull of the Sun; L1 being on the sun-facing side of Earth and L2 on the opposite or dark side of the Earth).

The total funding for the nine selected investigations, over a period of three years, is approximately $22 million. For the other investigations selected for the Instrument Incubator Program, log on to http://esto.gsfc.nasa.gov/programs/jp.
JANUARY

JPL astronomers gathered evidence that a shock is created when material falls in toward a dust disk around a growing star. Scientists believe dust particles in these disks clump together, leading to small rocks that can join together to form planets and comets. ... The Galileo spacecraft flew past Jupiter's moon Io on Jan. 17, the mission's last and closest flyby of any of Jupiter's four major moons. ... In a partnership with Norway, JPL researchers demonstrated the design of an ice-penetrating robot on a glacier far above the Arctic Circle. The probe melted down 23 meters (75 feet), establishing the viability of subsurface exploration. ... The Mars Odyssey spacecraft was raised up out of the atmosphere to conclude the aerobraking phase of the mission on Jan. 11. ... Using data from the SeaWinds instrument on the Quick Scatterometer (QuikScat), researchers dramatically improved the warning time for tropical cyclone development in the Atlantic and Eastern Pacific hurricane basins. ... Newly appointed NASA Administrator Sean O'Keefe paid his first visit to the Laboratory on Jan. 30 (above)."
where the winds converge year after year and drive ocean circulation south of the equator. ... NASA selected two new missions that will be managed by JPL for the Earth System Science Pathfinder small-satellite program. The Orbiting Carbon Observatory (right) will generate knowledge needed to improve projections of future carbon dioxide levels within the atmosphere, while Aquarius (bottom) will provide the first-ever global maps of salt concentration on the ocean surface, a key area of scientific uncertainty in the ocean's capacity to store and transport heat, which affects Earth's climate and the water cycle. ... Researchers created the first four-band infrared focal camera, which will allow them to "see" details that were unreachable with previous technology. This will aid pollution detection, weather prediction and other vital atmospheric and geological applications on Earth. ... Consolidated Edison of New York signed a technology affiliates agreement with JPL to develop sensor technology to detect and quickly analyze hazardous materials in the field.

**AUGUST**

The JPL-managed Stardust mission (below) began to collect tiny interstellar dust grains on its mission to collect and return the first samples from a comet. ... Five JPL proposals were among those selected by NASA for the Earth Science Enterprise's Advanced Component Technology Program, which will provide core component and subsystem technology developments that will enable new science measurements and visionary concepts. ... Three principal investigators from JPL were among those chosen by NASA to develop technologies and other advanced propulsion ideas as part of a suite of in-space propulsion technologies, which will greatly increase NASAs capability to conduct future planetary missions, especially to the outer planets of Jupiter and beyond.

**SEPTEMBER**

JPL scientists confirmed the first known capture of an object into Earth orbit from a Sun-centered orbit, thanks to continuing observations of what was most likely the third stage of a 1969 rocket to the moon. ... Building upon more than a decade of work on a standard called the linear ion trap, JPL's Frequency Standards Laboratory team developed and installed a new trapped ion atomic clock for the U.S. Naval Observatory in Washington, DC. Recent JPL innovations are expected to provide 20 times improved stability over previous trapped ion clocks.

**OCTOBER**

The highest resolution mid-infrared picture ever taken of the center of our Milky Way galaxy revealed details about dust swirling into the black hole that dominates the region. The image (right) was taken by a team at the Keck II telescope in Hawaii with the JPL-built Mid-Infrared Large-Well Imager camera. ... The Oct. 4 opening of JPL's Commercialization Center created a one-stop shop for U.S. companies that would like to work with the Lab's Commercial Technology Program. ... Using the NASA Global Differential GPS system at JPL, researchers demonstrated the ability to very precisely navigate airplanes in real time, anywhere in the world, independent of local navigational aids or infrastructure. This promises to extend precision navigation to infrastructure-poor areas of the world, potentially enhancing aviation safety in these areas. ... Researchers demonstrated a prototype device that automatically and continuously monitors the air for the presence of bacterial spores. The result is a novel alarm capability reminiscent of smoke detectors. ... Galileo imaged reddish spots on the icy surface of Jupiter's moon Europa, which may indicate packets of warmer ice rising from below. This upwelling could provide an elevator ride to the surface for material in an ocean beneath the ice.

**NOVEMBER**

After 37 close encounters with various planets, asteroids and Jupiters four large moons, Galileo dashed through Jupiters inner radiation belts past the moon Amalthea (below) on Nov. 5, its last flyby before impacting the planet next September. ... The search for planets beyond our solar system received a major boost with the dedication of JPL's Optical Interferometry Development Laboratory, Building 318 (right). ... A successful test of the camera on the Cassini spacecraft produced images of Saturn 20 months before the spacecraft arrives at that planet. The image shows the shadow of the planet falling across its rings and includes Saturn's largest moon, Titan. ... All systems on the Stardust spacecraft performed successfully when tested in a flyby of asteroid Annefrank, heightening anticipation for Stardusts encounter with its primary target, comet Wild 2, in late 2003.

**DECEMBER**

NASA selected four proposals for detailed study as candidates for the 2007 "Scout" mission in the Mars Exploration Program. The principal investigator leaders of the four selected by NASA chose JPL to be their project management partner. If any of the four proposals were to be selected for development, JPL would provide project systems engineering, mission assurance leadership, mission trajectory design and navigation, and mission operations leadership. (Right: Proposed Mars Volcanic Emission and Life Scout) ... JPL welcomed more than 20 members of the Mariner 2 team (below) to close out the years 40th anniversary of planetary exploration. Japans Advanced Earth Observing Satellite launched Dec. 13, carrying the JPL-developed SeaWinds instrument to monitor ocean winds.
Thursday, January 14

Paspas

EUGENE RITTEL, 77, retired electronics technician in 3FL Chemical Projects Group, died of cancer on Nov. 10. Rittel worked at JPL from 1959-86, and is survived by his wife Shirley, four children, 14 grandchildren and nine great-grandchildren.

Services were private.

MAURICE ESQUILIN, 37, an electrical engineer in Section 336, died Dec. 1. Esquiline hailed from STP, since 1985. He is survived by his parents, three sisters, one brother, one godson, and one goddaughter.

Services were held Dec. 15 at Holy Family Catholic Church in Long Beach.

JOHN ANDERSON, 55, a senior design engineer and technical writer, died Dec. 12. Anderson worked at the Lab from 1962-95. He is survived by his wife, Dorothy (nee Jhn) and Chris, daughter, Kathleen; and three nieces and nine grandchildren; his brothers, Norman and Arnold; and sisters Edie and Marlene. Memorial services were held Dec. 18 at St. Mary Catholic Church in Newhall.

DARIE FABRUADA, 65, a retired Electrical Engineer in the Facilities and Construction Section 6461, died Dec. 12 of kidney disease. Fabruada worked at JPL from 1969-99. She is survived by her husband, Freda, a son, and a daughter.

Services were held Dec. 21 at Azalea Hills 70th Ave Advent Church in Loma Linda.

Letters

Thank you so much for the beautiful plant that was sent to my home due to the death of my mother. Your thoughtfulness meant a lot to me as also lost my father this past March. However, each of my parents passed away, as Jesus Christ as their personal savior, so I will see them again in Heaven. Thanks again.

Robert Holt

Passings

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ERICKSTEN, 75, retired electrical engineer in 3FL Chemical Projects Group, died of cancer on Nov. 10. Ericksten worked at JPL from 1966-92, and is survived by his wife Shirley, four children, 14 grandchildren and nine great-grandchildren.

Services were private.

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Special Events

Calendar

Supporting Groups

Acquisitions Anonymous—Meetings are available. Call the Employee Assistance Program at 4-3680 for time and location information.

Caregivers Support Group—Meeting Jan. 9 at noon in Building 187-111 (The Wellness Place). Please note that this group meets the first and third Thursdays of the month. For more information, call the Employee Assistance Program at 4-3680.

Codpendents Anonymous—Meets at noon every Wednesday. Call Occupational Health Services at ext. 4-36.

Working Parents Support Group—Meets the first and third Thursdays of the month in Building 111-110. For more information, call the Employee Assistance Program at 4-3680.

Monday, January 6

J P Toymasters Club—A joint meeting with the Advanced Communications and Imaging System Teams. Speaker Bureau of Pasadena will be present to show new technology in entertainment. This year's featured speaker will be featured.

Tuesday, January 7

J P Artistic Radio Club—Meeting at noon in Building 301-207.

Wednesday, January 8

Social Security—A representative will be present to answer questions. For an appointment, call the Benefits Office, ext. 4-3760.

Thursday, January 9

Disney Imagineering will speak at the Center for Special Events, 11 a.m. to 1 p.m. in the 167 conference room.

Friday, January 17

Caltech Folk Music Society—Singer- songwriter David Massingill will appear in concert at the Mount Wilson Observatory Auditorium. Tickets are $15 for adults, $5 for children under 12. Call (626) 395-4652 or visit www.tifolkmusic.com.

Michael Martin—The renowned author will deliver a free lecture at 7 p.m. in Beckman Auditorium. For more information, call (626) 395-4652.

Real Estate

VALENCIA condo, 2 bd., 2.5 ba., 1,074 sq. ft., $275,000. Includes central air, color TV, VCR, microwave, d/w, pool, priv. parking, 3 mi. away from JPL. 626/351-9641.

LA CRESTA house, 3 bd., 2 ba., 1,650 sq. ft., $279,500. Includes central air, color TV, VCR, microwave, d/w, pool, priv. parking, 3 mi. away from JPL. 626/351-9641.

Vacation Rentals

BAKERSFIELD house, 2 bd., 1 ba., $195/night, sleeps 2, 1/2 hour to KSC, sleeps 6, avail. monthly. 626/351-9641.

Huntington Beach house, 2 bd., 1 ba., $195/night, sleeps 4, 1/2 hour to KSC. 626/351-9641.