Cosmically speaking, JPL is about to embark on a mission to the dark side. NASA's next space telescope, the Wide-field Infrared Survey Explorer, is preparing for a Dec. 9 launch that will provide pictures of the entire sky in infrared wavelengths that are invisible to the human eye.

The mission is scheduled to launch no earlier than 6:09 a.m. Pacific time from Vandenberg Air Force Base. WISE will circle Earth over the poles, scanning the entire sky one-and-a-half times over nine months, and will provide astronomers with a significantly different and unique view of the universe relative to visible wavelengths.

“The eyes of WISE are a vast improvement over those of past infrared surveys,” said UCLA’s Ned Wright, the principal investigator for the mission. “We will find millions of objects that have never been seen before.”

“The goal is to produce a catalogue of the entire sky in infrared in our four wavelengths, which are roughly five to 30 times longer than what we see with our eyes,” said Project Manager Bill Irace. The result will be a catalogue indicating a finding’s location and brightness—to be published 17 months after the sky survey is completed—as well as an atlas of images taken.

“Astronomers will be able to go into a database and say, ‘I want to look at that part of the sky,’ and pull up the actual images that were used to produce the catalogue,” said Project Scientist Peter Eisenhardt. “The result of this huge storehouse of images and data is actually what people will be looking for.”

Key targets for the mission include the most luminous galaxies as well as brown dwarfs, a type of failed star. Both of these are types of objects where infrared observations of the whole sky are essential to find them.

In some galaxies, more than 99 percent of the energy that is coming out is in infrared rather than visible wavelengths, noted Eisenhardt. “In a visible-light photograph they may be a little distorted and slightly unusual, but if you look at the infrared they’re just pouring out light, because they are forming stars at a phenomenal rate,” he said.

“Some of these ultra-luminous infrared galaxies are so bright they have a trillion or more times the luminosity of the sun, which is tens to even hundreds of times more luminous than the whole Milky Way galaxy. What we’ll be able to do is find the most extreme, brightest examples to dissect in detail with a powerful pointed telescope such as the Spitzer Space Telescope, or the upcoming James Webb Space Telescope.”

Brown dwarfs don’t have enough gravitational force to sustain the fusion reaction that keeps the sun shining so brightly, and they’re too cool to see in visible light, but they’re still warm enough to see in infrared light. Studies with Spitzer have shown that there are as many brown dwarfs as ordinary hydrogen-fusing stars, Eisenhardt noted. “If you look within 25 light-years of the sun, there are about 100 ordinary stars, but we only know of about five brown dwarfs,” he said. “We haven’t found them yet because you have to look everywhere in the infrared. So WISE will find these nearest stars, and there’s a 50/50 chance that there’s one closer than any star we know of right now.” Our closest star, Proxima Centauri, is about four light-years away, but there are reasonable odds that there’s a brown dwarf even closer than that, Eisenhardt added.

Asteroids, many of which are very dark, pose another prime target for the mission. Some of them are actually darker than coal, so you don’t have a good idea of how big an asteroid is just by how bright it is in reflected light, Eisenhardt said. “But if you look in infrared light with WISE, you’re measuring the asteroid’s own glow, and that’s a much better indicator of how big they are.”

The mission will also indicate how the infrared properties of asteroids change during an asteroid day. Asteroids rotate like Earth does, with a warmer day and a cooler night, meaning there’s more radiation coming off on the day side of the asteroid than on the morning side, which exerts a tiny force on the asteroid that gradually changes its orbit. “When that orbit changes enough, it can get into a resonance with Jupiter and get kicked all over the solar system,” Eisenhardt explained. “It’s actually thought...”
Since his high school math teacher allowed students to read magazines in class, Mark Whalen has been fascinated by space. At Caltech, his interest in the universe led him to become a student of G. F. Field, who was a close associate of Edwin Hubble, a pioneer in the field of extragalactic astronomy. However, it was not until he began his graduate studies at the University of California, Berkeley, that Mark truly embraced his love for space and embarked on a career in astrophysics.

Throughout his career, Mark has made significant contributions to the field of astrophysics, particularly in the areas of galaxy formation and evolution, and cosmic microwave background radiation. He has authored numerous papers in leading scientific journals and has been recognized for his work with several awards and honors.

Despite the challenges and long hours that come with a career in academia, Mark remains dedicated to his passion for the universe. He continues to inspire and mentor the next generation of scientists, sharing his knowledge and enthusiasm for the cosmos with his students and colleagues alike.

In his free time, Mark enjoys hiking, photography, and spending time with his family. He and his wife, a fellow astronomer, live in a small town in the mountains, where they can often be found stargazing and exploring the night sky.

Mark Whalen is a true champion of the scientific exploration of the universe, and his work continues to make a significant impact on the field of astrophysics. His dedication and passion for the universe is an inspiration to all who strive to understand the mysteries of the cosmos.

What is your biggest achievement so far in your career?

I am proud of my work on the Hubble Deep Field project, which was one of the most significant observations in the history of astronomy. It provided a glimpse into the early universe and revealed the existence of many new and exciting phenomena. I am also proud of my contributions to the study of galaxy evolution and the role of dark matter in the universe.

What advice would you give to someone just starting their career in astrophysics?

I would advise them to never lose their sense of wonder and to always keep an open mind. The universe is endlessly fascinating and there will always be something new to discover. It is also important to collaborate with others and to be part of a community of scientists who are committed to advancing knowledge.

What inspired you to become an astronomer?

I was inspired by my high school math teacher, who allowed us to read magazines in class. I was fascinated by the images of far-off galaxies and the possibility of discovering something new. This curiosity led me to pursue a career in astrophysics and to continue exploring the mysteries of the universe.
Muirhead back as chief engineer

Brian Muirhead will return to JPL from his assignment as chief architect and program systems engineer for NASA's Constellation Program and be reinstated as JPL's chief engineer. The chief engineer will now be elevated to an Executive Council position, and will continue as a joint appointment by the associate director for flight projects and mission success and the director for engineering and science. Muirhead will report to the associate director for flight projects and mission success, Chris Jones.

Muirhead has 32 years of broad technical experience and expertise in mechanical systems, flight system development and systems engineering. He led the design, development, test and launch activities of the Mars Pathfinder flight system and served as Pathfinder's project manager after its successful landing on Mars in 1997. He was the Deep Impact project manager through critical design review, and served as the chief engineer for Mars Science Laboratory.

Pellegrino honored for balloon work

Sergio Pellegrino, a Division 250 senior research scientist and professor of aeronautics and civil engineering at Caltech, has received the NASA Robert H. Goddard Exceptional Achievement Award as a member of the superpressure balloon team.

The award is for sound engineering and operational development, outstanding teamwork, and perseverance in building a new scientific balloon capability for NASA. The superpressure balloons have made ultra-long-duration flights possible, enabling a new era of scientific discovery.

Hubble instruments at Smithsonian

Two key instruments from NASA's Hubble Space Telescope—the JPL-developed Wide Field and Planetary Camera 2 and the Corrective Optics Space Telescope Axial Replacement, or COSTAR—have a new home in the Smithsonian's National Air and Space Museum in Washington, D.C. after being returned to Earth aboard space shuttle Atlantis last May.

The Hubble instruments will be on display in the museum's Space Hall through mid-December. They then will travel to Southern California to go on temporary display at several venues. In March 2010, the instruments will return to the Smithsonian Air and Space Museum, where they will take up permanent residency.

Stratman new Caltech general counsel

Victoria Stratman has been named Caltech's new general counsel. She began her new duties on Dec. 1.

Stratman joined the staff in Caltech's Office of the General Counsel in 1996 as associate general counsel and has been serving as deputy general counsel since 1998.

"Over the past 13 years, she has demonstrated an in-depth understanding of the complex legal and management issues that confront a research university that manages a federally funded research and development center, major observatories and diverse science and technology centers," said Caltech President Jean-Lou Chameau.

Stratman was selected following an extensive nationwide search, Chameau noted. "Being able to appoint an internal candidate at the conclusion of a highly competitive search is very gratifying," he said. "This is not only an affirmation of Vicci's qualifications, it is also a tremendous validation of Harry Yohalem's efforts to develop a talented legal team during his tenure as general counsel."

Passings

Joseph "Phil" Click, 83, a retired JPL assistant Laboratory director, died Sept. 11.

Trained as a lawyer, Click became a special agent with the FBI. He later worked as legal counsel for the Atomic Energy Commission.

Starting as assistant project contracts manager in the Procurement Division in 1962, he later served as staff contract analyst for Procurement. In 1964, he was appointed staff assistant for procurement at Caltech, and in 1966, he returned to JPL as manager of the Procurement Division. He became assistant Lab director for administrative divisions in 1968.

Click was awarded NASA's Exceptional Service Medal in 1973. He is survived by his wife, Dorothy, sister Barbara and four children, including law in-mours Frances Stevens, nephews Michael (Dee) Redwine, Kenneth (Dawn) Redwine, and Will Stevens and nieces Rebecca (Keith) Lincoln and Sarah (Darwin) Vandenberg.

Services were held in Oro Valley, Ariz.

Toby Solorzano, 62, a retired member of the Human Resources Division staff, died Sept. 16.

Solorzano worked at the Lab from 1986 to 2006 in the staffing, recruitment and diversity office.

He was survived by his wife, Barbara, daughter Marisa and son Toby Clark. Services were held in Claremont, Calif.

Vincent Anicich, 67, a longtime JPL chemist, died Nov. 3.

Anicich joined JPL in 1976. He was an investigation scientist for the ion and neutral mass spectrometer on Cassini. His JPL research was focused on ion-molecule reactions, especially related to Titan's atmosphere, and he developed an ice simulation facility to study processes in the interstellar medium and outer solar system icy satellites.

In 2002 he became supervisor of the Atomic and Molecular Collisions Group. He retired in 2004.

Anicich is survived by his father, John, wife Marjorie, four children and four grandchildren. Services were held Nov. 9 at St. Rita's Church in Sierra Madre.

Dennis Enari, 72, a retired JPL telemetry manager, died Nov. 8.

After working at JPL for contractor Bendix Field Engineering as a senior field engineer in deep-space operations, control and planning and as a systems data analyst for command and tracking systems, Enari became a JPL employee in 1970. Among his rules were manager of tracking and data systems and manager of telecommunications and mission support for selected NASA and European Space Agency projects. He retired in 1999.

Enari is survived by daughters Batya and Kira, sister Carolyn, brother Donald, grandchildren Brachah, Yesof and Danya, and ladyfriend Jeanette Cano.

Services were held Nov. 12 at Forest Lawn in Glendale.

Letters

From my heart, a thousand thank yous to my JPL colleagues for their words of sympathy and kind deeds after the recent passing of my father. Your support meant a lot.

Jane Platt

We would like to thank our friends at JPL for their sympathy over the sudden passing of my dad, William Bell. The kind words, cards and plants were greatly appreciated during this difficult time.

Bryan and Michele Bell

My family would like to thank JPL for all of your kindness and thoughtfulness on the passing of my husband, Toby Solorzano. He was a great man who gave 20 happy years of his precious life to JPL.

Barbara Solorzano, Marisa and Toby Clark

Retires

The following JPL employees retired in November:

Charles Kurzwell, 52 years, Section 382B; Roger Helixon, 31 years, Section 3-466; Charlotte Marsh, 31 years, Section 1702; Charles Ruggier, 25 years, Section 333F; Juinn Jung Wu, 17 years, Section 2545; Jacob Chapsky, 16 years, Section 383H; David Mih, 11 years, Section 5126; Lawrence Scherr, 11 years, Section 383J; Donald Benson, 10 years, Section 3754.
**HOLIDAY ELECTRICAL SAFETY**

By Masoud Jafari
Fire Safety, System Safety Program Office

- Inspect all electrical decorations to make sure that they are not damaged before plugging them in. Cracked or frayed sockets, loose or bare wires and loose connections may cause a serious shock or start a fire.
- Use lights and other electrical decorations that bear the seal of a nationally recognized certification agency such as the Consumer Safety Association (CSA), Underwriters Laboratory (UL) or Electrical Testing Labs (ETL).
- Follow the use and care instructions that accompany your electrical decorations. Check packaging to determine the maximum number of strings that may be linked together. Always unplug an electrical decoration before replacing light bulbs or fuses.
- Don’t allow children or pets to play with electrical decorations. Even small light decorations can produce a deadly electric shock if they are misused.
- Halogen lamps operate at high temperatures. Make sure halogen bulbs do not come into contact with draperies, clothing or other flammable materials.
- For added electric shock protection, plug outdoor electric lights and decorations into circuits protected by ground fault circuit interrupters (GFCIs). Portable outdoor GFCIs can be purchased where electrical supplies are sold.
- Never use electric lights on a metallic tree, which can become charged with electricity from faulty lights.
- Turn off electrical light strings and other decorations before leaving home or going to bed. Automatic timers are available for both indoor and outdoor applications.
- Use a dry wooden or fiberglass ladder when hanging holiday lights, and be sure to stay clear of overhead electrical wires.
- Do not use staples, nails or thumb tacks to hold outdoor lighting in place as this can start a fire. Use hooks or insulated staples instead to hold outdoor lighting in place.
- Examine extension cords to make sure they are not cracked, frayed, cut or damaged. Never run extension cords across the walkway or under the rug.
- Use extension cords sparingly and do not overload them.
- When using extension cords outdoors, make sure they are marked for outdoor use by checking the label on the box and be sure to plug them into a GFCI-protected outlet.
- Keep outdoor decorations elevated so that water won’t drain into the electrical connection and cause a shock or a short circuit.
- Watch for flickering lights, sparks from appliances, switches or wall outlets, circuits that do not work, and switch plates and wall outlets that are warm to the touch. If any of these conditions are found, you should have them repaired immediately.

**DEEP-FRIED TURKEYS**

By Gregg Ellers

With the holidays upon us, creating a holiday meal is traditionally centered on a roasted turkey. However, more people are discovering the delicious and unique taste of deep-fried turkey. After enjoying the juicy meat, crisp exterior and tasty flavor, many people swear that frying a turkey is the only way to do it right. Yet, there are a few safety tips that you should follow when frying a turkey because it is a little trickier than putting a turkey in the oven.

The Environmental Health and Safety Office (OSPO, SSPO and EAPO) would like to wish everyone a happy and safe holiday season and remind everyone that the practice of deep-frying turkeys is hazardous. If you don’t take precautions, you may end up with an injury or fire. Deep fryers can be dangerous because:

- Many units easily tip over, spilling the five gallons of hot oil within the cooking pot.
- If the cooking pot is overfilled with oil, the oil may spill out of the unit when the turkey is placed into the cooking pot. Oil may hit the burner/flames, causing a fire to engulf the entire unit.
- Partially frozen turkeys placed into the fryer can cause a spillover effect. This too, may result in an extensive fire.
- With no thermostat controls, the units also have the potential to overheat the oil to the point of combustion.
- The sides of the cooking pot, lid and pot handles get dangerously hot, posing severe burn hazards.

**LANYARD SAFETY**

Lanyards have become very popular and are widely used at JPL. The neck lanyard allows the ID badge to be readily seen for easy identification. However, lanyards can have their drawbacks if not worn properly or if they are distributed to the wrong users or in the wrong situation. One should always consider the potential hazards of their work areas when purchasing a lanyard.

When working around machinery or other hazardous area, neck lanyards are discouraged. JPL suggests a clip-on type of badge holder.

For non-hazardous areas, the best and safest lanyard is one that has the “breakaway” feature. If the lanyard is caught on the edge of a desk or any other protruding object, a small plastic piece on the lanyard breaks apart and allows the lanyard to “fall” from the neck, preventing neck injuries and other more serious injuries.

JPL Stores offers both kinds of lanyards; regular and breakaway. Consider your working area and any potential areas where a neck lanyard can get caught. When in doubt, breakaway is always the safest, best choice.
A w a r e n e s s
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S a f e t y
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Follow the manufacturer’s instructions.
• Turkey fryers should always be used outdoors a safe distance from buildings and any other material that can burn.
• Never use turkey fryers on wooden decks or in garages.
• Make sure the fryers are used on a flat surface to reduce accidental tipping.
• Never leave the fryer unattended.
• Never let children or pets near the fryer when in use. Even after use, never allow children or pets near the turkey fryer. The oil inside the cooking pot can remain dangerously hot, hours after use.
• Only deep-fry smaller turkeys—up to 12 pounds.
• To avoid oil spillover, do not overfill the fryer. Use this simple practice first:

Place the bird into the cooker that is to be filled with oil.
Fill the rest of the cooker up with water to the prescribed level as indicated on the side of the cooker.
Remove the bird from the cooker, leaving only water in the cooker.
The level of water left in the cooker is roughly equal to the amount of oil you should use.
Note: The oil will expand somewhat when heated. After draining the water out of the cooker, use a slightly smaller amount of oil; say two to three cups less.
• Make sure the turkey is completely thawed and be careful with marinades. Oil and water do not mix, and water causes oil to spill over, causing a fire or even an explosion hazard.
The National Turkey Federation recommends refrigerator thawing and to allow approximately 24 hours for every five pounds of bird thawed in the refrigerator.
• Before frying, pat the turkey dry with paper towels to keep the hot oil from spattering and popping.
• Slowly lower the turkey into the oil, and maintain an oil temperature of 350°F. Fry turkey for three to four minutes per pound or about 35 to 42 minutes for a 10- to 12-pound turkey.
• Use well-insulated potholders or oven mitts when touching pot or lid handles. If possible, wear safety goggles to protect your eyes from oil splatter.
• Do not stuff turkeys for deep-frying.
• Keep an all-purpose fire extinguisher nearby. Never use water to extinguish a grease fire. Remember to use your best judgment when attempting to fight a fire. If the fire is manageable, use an all-purpose fire extinguisher. If the fire increases, immediately call your local fire department for help.
• Even after use, never allow children or pets near the turkey fryer. The oil inside the cooking pots remains dangerously hot, hours after use.

Bon appétit!!!

Solution can be found on JPL’s Safety Website  http://safety/News/