

Discovery Dispatch

A Quarterly Newsletter of the NASA Discovery Program

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In memory of the crew of STS-107



Captain David Brown, Colonel Rick Husband, Commander Laurel Clark, Dr. Kalpana Chawla, Lt. Colonel Michael Anderson, Commander William McCool and Ilan Ramon, Israeli Air Force Colonel .

In an age when space flight has come to seem almost routine, it is easy to overlook the dangers of travel by rocket, and the difficulties of navigating the fierce outer atmosphere of the Earth. These astronauts knew the dangers, and they faced them willingly, knowing they had a high and noble purpose in life. Because of their courage and daring and idealism, we will miss them all the more.

All Americans today are thinking, as well, of the families of these men and women who have been given this sudden shock and grief. You're not alone. Our entire nation grieves with you. And those you loved will always have the respect and gratitude of this country.

The cause in which they died will continue. Mankind is led into the darkness beyond our world by the inspiration of discovery and the longing to understand. Our journey into space will go on.

President George W. Bush
February 1, 2003

Discovery Home Page

<http://discovery.nasa.gov>

Discovery Video Receives Industry Awards

"Unlocking the Mysteries," a video overview of NASA's Discovery Program and the ten ground-breaking science missions selected to date, has won two honors in The Communicator Awards 2002 Video Competition. The video, written and produced by Discovery Program Outreach Manager Shari Asplund, in collaboration with Richard L. Goldberg at The Johns Hopkins University Applied Physics Laboratory television production department, won a Crystal Award of Excellence in the Government category and an Award of Distinction for writing in the Creative category.

The 23-minute video looks back at the program on its 10 year anniversary and highlights the achievements of missions such as NEAR and Mars Pathfinder that are enhancing our understanding of the Solar System.



The Communicator Awards is an international awards program founded by communications professionals to recognize excellence in the field. The Crystal Award of Excellence is given to those entries whose ability to communicate puts them among the best in the field. The Award of Distinction is presented for projects that exceed industry standards in quality and

excellence. This year there were 3,242 entries from 48 states and nine countries. Entries are judged against a high standard of excellence rather than against each other. Only 13% were recognized with the top award.

The production was also named a finalist in the New York Festivals International Film and Video competition in The Sciences category. The New York Festivals, which honors excellence in communications media worldwide, was founded in 1957 as an international awards competition designed primarily to reward outstanding achievements in non-broadcast media.

An excerpt from the video can be viewed by clicking [here](#).

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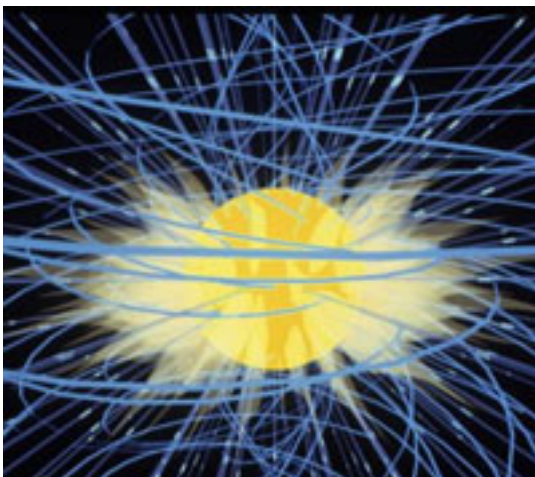
First Year Success for Genesis

In early December the [Genesis](#) spacecraft exceeded the one year mark in the collection of solar wind samples. Telemetry from the spacecraft indicates that it is spinning at a rate of 1.584 rotations per minute and in overall good health.

On Dec. 10, Genesis fine-tuned the spacecraft's orbit around the L1 point of gravitational stability between Earth and the Sun. This station-keeping maneuver was the seventh of 15 planned during the lifetime of the mission. Telemetry downlinked after the burn indicates that the spacecraft's small hydrazine thrusters fired for 291 seconds and the desired velocity change of 1.25 meters-per-second (2.68 miles per hour) was achieved.

On Dec. 18, a minor setting change in the flight software was transmitted up to the spacecraft to decrease the sample concentrator grid maximum voltage from 2060 volts to 1980 volts. The Genesis science team is confident this configuration change will decrease the frequency and duration of voltage sags that occur in the concentrator grid.

Genesis scientists at Los Alamos National Laboratory (LANL) are beginning analysis of first-year data. They have determined the spacecraft is working so well that they are considering possibilities for research beyond the planned 2004 mission. Over a period of about 22 months, Genesis will collect just 10 to 20 micrograms of the solar wind elements of interest - or the equivalent of a few grains of salt—and return them to Earth in September 2004. Lead researcher Roger Wiens of LANL's space and atmospheric sciences group and his collaborators plan to propose to NASA that the mission be extended. The researchers have determined that there is enough fuel on board to propel the ship even closer to the Sun following its return trip to Earth and the delivery of the sample return capsule. "We believe that after the sample container is returned to Earth, the spacecraft will be in good enough shape to enter a new solar observation orbit some four to six million miles from Earth, where it can continue to provide us with valuable solar wind data," said Wiens. "There's a lot of fuel left, the possibilities are really endless."



At the American Geophysical Union meeting in San Francisco in December, Wiens reported on early data analysis that has yielded a surprise finding of sunward traveling electrons in high-speed "coronal hole" solar wind that mimic solar wind electrons from Coronal Mass Ejections that are sometimes responsible for communications blackouts and power interruptions on Earth.

Read more about Wiens findings [here](#).

Education and Public Outreach Highlights

Two education modules developed by McREL for the Genesis mission have been selected for inclusion in NASA's SciLinks textbook project. To be included, modules had to meet a stringent set of criteria that ensure selected materials have accurate content and reflect classroom best practices. The two selections are:

- Genesis education module: [Understanding Elements](#)
- Genesis public module: [Sunlight and Solar Heat](#)



An Alta Loma high school student during field testing of the education module, "Understanding Elements."

Thousands of passengers who flew United Airlines both domestically and internationally had the opportunity to watch an in-flight video on the Genesis mission during the past month. The recently released Genesis mission video titled "Testing to Assure Mission Success" gives the viewer a look inside Los Alamos National Laboratory. This is the third Genesis mission video included in the airline's programming.

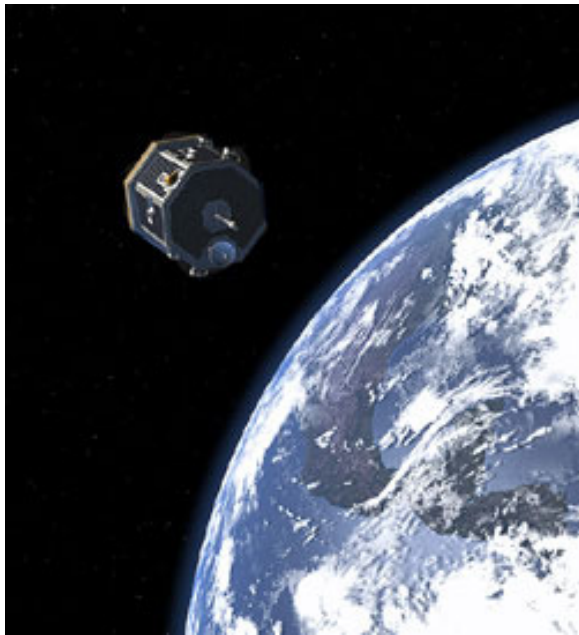
Classroom learning materials designed to complement the video that are aligned to the national standards are available online. You can view the video online and access the materials by clicking [here](#).

CONTOUR Team Ends Contact Attempts

Final efforts to communicate with [CONTOUR](#) ended on Dec. 20 without a signal from the spacecraft, and mission managers say they will not try to contact the silent probe again.

"Given what we suspected about CONTOUR's condition, and that we haven't received a signal after several contact attempts, we don't believe the spacecraft is recoverable," said Edward Reynolds, CONTOUR project manager at The Johns Hopkins University Applied Physics Laboratory (APL), which managed the CONTOUR mission for NASA. "At this point the project will recommend to NASA that efforts to contact the spacecraft should end, and the project will formally close down."

Launched July 3, 2002, CONTOUR fell silent on Aug. 15, during a maneuver to boost the spacecraft from a parking orbit around Earth. Ground-based telescope images taken shortly after showed three objects near CONTOUR's expected path, indicating CONTOUR had broken up near the scheduled end of the burn. Attempts to contact the craft in the weeks after the anomaly proved unsuccessful.



Artist's concept of the CONTOUR spacecraft.

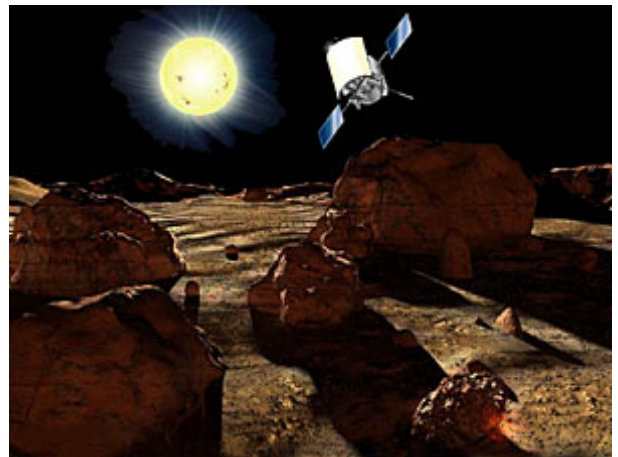
CONTOUR team members planned the final contact effort for December, when they believed the spacecraft's multidirectional pancake beam antenna would be better positioned to receive signals from Earth. Mission operators at APL sent several "transmit" commands through NASA's Deep Space Network (DSN) antennas toward the suspected location of the largest piece, thought to be the bulk of the spacecraft, about 42.5 million miles (68 million kilometers) from Earth. After 16 total hours of sending and listening, no signal came back.

A NASA-appointed panel, led by NASA Chief Engineer Theron M. Bradley Jr., is investigating potential causes of the mishap.

MESSENGER Development Continues

Schedule and cost remain [MESSENGER](#)'s top concerns. The critical-path item for the project is now integration of the propulsion subsystem with the structure at Aerojet. Progress is being monitored closely to maintain schedule for delivery of the integrated structure/propulsion system to APL for I&T. Workarounds are being pursued by the I&T team to accommodate late deliveries of other spacecraft subsystems and instruments.

Cost containment continues to be worked. The staffing level at APL is being actively managed to ensure that the spending profile is contained. Cost-to-complete information continues to be analyzed.



Artist's concept of MESSENGER from Jim Hansen, Aerojet.

Preparations for instrument calibrations continued in December. Preparations for data management also continue. A Science Steering Committee teleconference was held on 12 December.

In early November, the MESSENGER Deputy Project Manager resigned from APL. Mr. David Grant was appointed Project Manager-designate on 8 November. The current Project Manager will help assure a smooth transition through 31 January.

Education and Public Outreach Highlights

Development of the new web site continues, focusing on: posting of the "Frequently Asked Questions" or FAQ that combines input from Challenger Center and APL; continued modification of all pages to meet accessibility guidelines; and ongoing development of the portion of the site that includes the Education Modules.

Work is progressing on the MESSENGER education modules. Chuck James and Rick Shope developed working drafts of two activities that will be field tested in the winter and spring of 2003.

Each of the activities supports the MESSENGER module “Comparative Planetology”.

Mary Radnofsky and Harri Vanhala worked on the design challenges for the “Staying Cool” unit of the “Framing Pathways” theme. The middle school challenge is to keep a carton of milk from spoiling for a week. The high school challenge asks students to design a container to keep a variety of items from burning in a fire.

Filming continues for the MESSENGER documentary. The film crew obtained some great material at the end of October during a trip to California to film Ted Hartka and Neal Bachtell packing up and shipping the shiny new structure from Composite Optics, Inc. to Aerojet in Sacramento. More recently, they filmed the Mercury Dual Imaging System (MDIS) team doing some clean room work on their filter wheel and shot the solar array deployment testing, both at APL.

Work is beginning on the first plain language MESSENGER book and a new round of interviews for the *MESSENGER Minute* radio spots.

Max Peterson's Excellent Adventure

Whether you love what you do or you do what you love, you're better off enjoying your life while you can, because you'll be dead for a long time and that doesn't sound like much fun.
-Yogi Berra

After a distinguished career spanning over 40 years doing what he loved, MESSENGER Project Manager Max Peterson is retiring at the end of January. As he reflects on what has been a very prolific, rewarding and enjoyable career, he marvels, “Just the thought of being able to get paid for what you love to do—that’s amazing”.

Growing up in Marquette (“middle of nowhere”), Kansas, population 600 then and now, Max had the kind of well-rounded childhood typical for a small Midwestern town. In high school he played football in the fall, basketball in the winter, and ran track in the spring. He also played trombone in the school band. All these activities helped instill in young Max the importance of teamwork. “You have to learn how to play fair,” he says, “It was an excellent experience which a lot of kids don’t get here because their schools are too large and there’s so much competition. I wasn’t all that good but at least I made the team.” While in high school he also helped publish the town’s weekly newspaper, which is still published and he still subscribes to.

As a kid, Max was into chemistry. He and his buddies made flash powder, back when you could buy the ingredients from the local drug store. He had a microscope, and he enjoyed science. “I developed a real love for mathematics,” he says, “I had an excellent high school math teacher who made it interesting.” After graduation from high school, Max spent a summer in Coffeyville, Kansas, working on the Coffeyville Daily Journal.

Max attended Kansas State University where he started out in aeronautical engineering because he wanted to fly. Then he discovered his eyesight was bad and he’d never be able to fly for the military or commercially. “That was 1957,” says Max, “about the time that Sputnik was launched. I was all set to switch majors and didn’t know what to do, so I came home and talked to Dad and he suggested electrical engineering.” Max’s technically inclined father was a mechanic who ran a small garage. He took Dad’s advice and switched to EE, graduated in 1961 and went to work at the Applied Physics Lab (APL) on the Polaris Fleet Ballistic Missile Readiness Program. After about 1-1/2 yrs, he left and went to Texas Instruments in Dallas where he did electronics design.



Max Peterson

Max was in Dallas on November 22, 1963. “Love Field, the primary airport then, was out near where the TI apparatus division was,” he says. “Many of us walked from the plant to the street where President Kennedy drove by, then we walked back to the plant and found out he had been assassinated. We saw him just minutes before. That was a shocker, then what was even more of a shocker was to find out that Lee Harvey Oswald lived in Irving, the little town we lived in just northwest of Dallas.”

The following spring Max returned to Maryland to work in APL’s space department and he’s been there ever since. His early work included data instrumentation, overall data handling system design, and test of several near-Earth spacecraft. This led to one of Max’s career highlights. “I designed and developed the data handling system for a series of small astronomy satellites that were launched off the coast of Kenya. Two old oil drilling platforms from Texas were installed three miles off the coast. The Scout rocket boosters were floated to the towers and a number of satellites were launched from there. I actually got to go to Africa to be part of a launch team — that probably is one of the neater things I ever did in my career.” The team had some down time when the rocket had a problem, so a few of them took a safari to Tsavo game park and, recalls Max, “just about got squashed by a rhino.” He’s got movie film with sound from that adventure. “We were in Africa for six weeks two different times,” he says, “Who would have thought a little boy from Kansas would be where I’ve been—it’s amazing.”

Max’s entry into management started around 1983 when he became the assistant program manager for a spacecraft called

AMPTÉ. He moved on to a program called Polar BEAR, where his manager was Dave Grant. With Max's retirement, Dave will be taking over as project manager for MESSENGER.

Max's management philosophy is to pick good people and stay out of their way, and he feels that has worked well. He believes the manager needs to make sure there's a schedule, assign personnel, and track the budget. "Where the technical knowledge always came into play," he says, "is when you're listening to a group of people discuss something, you're not totally in the dark. You have an appreciation of what they're trying to do. If you see them going down a path where they may drop over a cliff, you have to be schooled enough in the technical aspects to guide them to re-think something you're not quite sure is the right path to take. And if they come back and justify it to you, then you would be wise to accept their opinion and let them go on."

MESSENGER was selected as a Discovery mission in July 1999. Max guided the proposal and concept study, and became the manager when work began in December 1999. Asked to describe a typical day, Max says, "Sadly, the majority of it is spent in my office. With the advent of electronic communications, you get an awful lot of information coming to you from emails and phone calls. What I always really liked to do, prior to MESSENGER, was spend more time just walking around talking to people. But now there are so many things happening that I have to spend a great deal of time in my little office just keeping track of budget, schedule and personnel. I've always had an open door policy. If somebody's got a problem, I don't want them to be afraid to come to me and ask for help. Also, a good bit of my day is spent chatting with people who come in to discuss issues of budget and schedule."

Max believes that people skills are a key to success. "The biggest thing that I always like to point out," he says, "is that you need to treat people the way that you would like to be treated. If you do that, you can build a team pretty easily. There's really no magic to it, it's learning people skills, and you can't go to school to learn that. It's an acquired skill. You can learn the basics of management by going to school, how to do schedules, how to control costs and things like that, but part of team-building is being able to relate to people. I always use the philosophy that I treat people the way I'd like them to treat me, and it seems to have worked pretty well."

Discovery missions involve extensive teaming arrangements among people at different institutions, so good communication is essential. Max established a MESSENGER Forum web site that's open to all the team members. It contains briefing material generated for reviews, progress reports, anything relevant the team members want to post. They also have a weekly core team meeting at APL, which includes Principal Investigator Sean Solomon. Following that is a meeting where all the lead engineers and members of their teams hear presentations from various subsystems. The character of that meeting changes as the project moves into different phases. MESSENGER also issues a very comprehensive monthly progress report so all team members can track what's going on, how the design is coming, etc. About once a month, Sean convenes his science steering committee, which

includes the heads of the four different discipline groups, on a 2 hour telecon where they discuss science issues.



MESSENGER Team photo

According to Max, "We try to cut down on travel because of limited funding so we do have a lot of telecons, but there's no substitute for face to face meetings with people. Sean has an unbelievable grasp of all the elements of this mission, from engineering through science, management, the whole bit, and he's willing to come out here to APL. That's a key issue. When you have a PI who has responsibility for the mission and they're willing to come out and be a part of it, it makes for much higher probability of success, and Sean is willing to do that."

Discovery missions also must exist within tight cost and schedule caps. How has Max dealt with these constraints? "In our case," he says, "there's a very definite schedule constraint because of the planetary alignments. We need to launch on a particular date to be able to use gravity assists to avoid having to expend fuel. That's one deadline that always looms at you. The other thing which is really tough is the cost cap. It's a necessary thing to keep mission costs from going out of sight, but when you start you have only a reasonably good vision of what you've got to do to get there. Along the way you discover that a lot of your assumptions were not totally correct—for example our solar array. We had done a significant amount of testing on the selection of solar arrays and the design of the panels, but we found that we had a very tight mass constraint that caused us to rethink the design. In fact we ended up going back and requalifying them again. So, at the time we started, we thought we had sufficient mass margin, but as we got into it, we found out we were lacking in mass margin and there were some things we could do to save mass. So it's those kind of little surprises that make it difficult to live within that cost constraint."

Max feels that cost, schedule and technical challenges are equally difficult on MESSENGER. "It's a very ambitious mission," he says, "There are thermal challenges in going to the hottest planet in the solar system, so in this case it's really a trio—cost, schedule and technical. We've gotten the technical things in the box, we believe. We're not doing so well on the cost, and we have a very tight schedule which we really think we can meet."

The most exciting aspect of MESSENGER for Max is being part of such an ambitious mission that will help us understand our own environment a little bit better. "Knowing that hopefully you have contributed to getting it on its way to Mercury," he says, "I think that's the most exciting thing, seeing the pieces come together and waiting for the data to come back. It will be a fairly long time for that, but there will be flybys where data will be taken and the scientists will get an opportunity to look at their data and see pictures of parts of Mercury that have not been seen before."

Max's plans for retirement include building a home in western Maryland, on a man-made lake known as Deep Creek in Garrett County. Max and his wife have a son and daughter and eight grandchildren, and they envision fun family gatherings at Deep Creek—boating and water-skiing in the summer and snow skiing in the winter. He wants to do wood working and gardening and organize all the research his dad did on their family genealogy. "There's a ton of things I'd like to do that I've not had an opportunity to spend time on," he says, including working with students. He's considering doing one-to-one tutoring of students in the sciences or math at the local community college. "I'd like to help people gain a love of science because it's been an unbelievable trip for me. I got paid for doing what I wanted to do. That's an amazing situation to find yourself in."

Stardust Counts Down to Encounter

[Stardust](#) returned to normal cruise operations in late November after its flyby of asteroid Annefrank on Nov. 2. The spacecraft is healthy, on course, and performing well.

As part of a technology demonstration, a New Mexico antenna of the National Radio Astronomy Observatory's Very Long Baseline Array successfully received a Stardust downlink signal. Additional tests may lead to the use of the Very Long Baseline Array as a new resource for navigational tracking of NASA missions.

On Dec. 9, Stardust successfully concluded its second collection period of interstellar particles. Telemetry verified the spacecraft's wrist, shoulder, and hinge motors all performed as expected and that the collection grid was successfully stowed. This collection period spanned 126 days.

On Tuesday, Jan. 2, 2003, the countdown clock to Stardust's encounter with Comet Wild 2 dropped below the one-year mark. Next month will be another milestone as Stardust begins its third year of space exploration. These milestones and the entire Stardust mission were chronicled by Principal Investigator Donald Brownlee of the University of Washington during his keynote speech to the American Astronomical Society in Seattle in January.

Education and Public Outreach Highlights

The Stardust EPO Team is teaming up with NASA's [Space Place](#) community partners to share the excitement of comet exploration

and the mission's journey to encounter comet Wild 2 (pronounced Vilt 2). The Stardust mission is making available on temporary loan a 1/25th scale spacecraft model to museums, science centers, and/or planetaria currently partnered with the Space Place network, many located in rural and underserved locations.

Other Stardust partners include:

- U.S. Space Foundation, Colorado Springs, CO. When possible Stardust provides content and/or speakers for their yearly education trainings. The program reaches 1200 educators per year, the majority being Hispanic and/or Native American.
- Girl Scouts of the USA. Working with the Solar System Exploration Forum and Deep Impact mission, Stardust will provide activities and materials for girl scout troops and provide speakers when possible.
- Parents and Children as Co-Travelers (PAACT). This program is designed to help parents help their children with essential skills such as critical thinking and teamwork. PAACT uses the Stardust mission as one of its science missions.
- Challenger Centers. One of Stardust's original partners, 26 centers throughout the U.S. continue to disseminate materials and information to students on the mission and comet exploration.



Photo courtesy of Gary Conklin.

Space enthusiast Jim Stryder, an aerospace journalist/consultant at the Western Colorado Math and Science Center in Grand Junction, CO, shows Brittany Church a sample of aerogel supplied by the Stardust mission and an authentic piece of space shuttle heat shield tile, supplied by Rockwell International Space Systems.

In early January at Clifton Elementary School near Grand Junction, CO, Jim Stryder conducted the third in a series of on-site night-time school programs which attracted over 400 students, teachers and parents.

Jim says, "We show the aerogel and heat shield tile, side-by-side to point out their differences, how they're used, and just what they're

used for. The aerogel really is unique. We can turn the lights off in a room and illuminate it with either a wide white-light from a laser or small pinpoint flashlight and it gives off its characteristic "blue smoke" turquoise blue color! It really has been a crowd attention getter, especially among the parents!"

Deep Impact Continues on Track

Development of the [Deep Impact](#) spacecraft continues at Ball Aerospace in Boulder, CO.



Several members of the instrument team at Ball Aerospace celebrate a major milestone in the Deep Impact mission - mounting the instruments to the instrument platform of the flyby spacecraft. These instruments will observe the impact from a safe distance and then look inside of the crater as Comet Tempel 1 flies overhead.

Education and Public Outreach Highlights

Deep Impact was selected by [Discovery Channel's project Quest](#), which will be following the mission and featuring it in TV documentaries and the internet. The website has a profile of the mission and Principal Investigator Mike A'Hearn.

The National Science Teachers Association (NSTA) published the Deep Impact poster in the October issue of "The Science Teacher" along with an article by Gretchen Walker about her education module called "Excavating Cratering."

Deep Impact demonstrated comet activities at the National Girl Scout Leader convention in Long Beach, CA, where several hundred leaders watched and took copies of the activities for their troops or councils. The mission outreach team is also forming a relationship with the Mount Wilson Vista Council, CA, to assist one group of regional master leaders as they train the next level of leaders who will then train the scouts themselves. This will help the mission evaluate the impact of their master leader training.

Elizabeth Warner, Liaison to Amateur Astronomers for the Deep Impact mission, spent several chilly nights (and days) at the Mid-Atlantic Star Party near Robbins, NC, at the end of October. This

annual event draws amateur astronomers from all over the southeastern U.S. to a weeklong campout where the main event is clear, dark skies for observing. About 350 people attend. During the day, attendees check out each other's telescopes and get new bits and pieces for their telescope from the many vendors who also attend.

On Friday and Saturday afternoons, attendees also get to hear various talks. Elizabeth gave a talk about the mission to an audience of 60 people. Attendees who hear Elizabeth's talk then invite her to come to their club and give a presentation to the rest of their members in the Spring. Last year's follow-up tour took Elizabeth to SC, NC, and TN. The plans aren't finished yet for this year, but so far she'll be heading out to NC and TN in the spring.

Kepler Mission Work Underway

[Kepler](#) is a mission to explore the structure and diversity of planetary systems. Its ambitious plan is to survey a large sample of stars and determine the frequency of terrestrial and larger planets in or near the habitable zone of a wide variety of spectral types of stars.

The mission team has been gearing up in a number of areas. Recent accomplishments include the design, analysis, fabrication and assembly of components of the photometer, completion of the draft Ground Segment Requirement Document and continued requirements definition of the spacecraft.

Near-term plans include evaluating optics proposals, initiating Flight Segment Integration & Test Plan development, and conducting optics internal design and long lead procurement reviews.

Education and Public Outreach Highlights

Kepler Mission E/PO has been just starting up as of November. The main project for the coming year is the Planet Transit element of the Cosmic Origins (Cradles for Life) exhibit being developed by Space Science Institute (SSI) in Boulder, CO. Lawrence Hall of Science (LHS) Exhibits staff met with SSI to discuss learning goals for this element of the exhibit:

- Understand what a planetary transit is
- Understand how transits help scientists determine a planet's size
- Understand how transits can be used to characterize a planet's orbital period and thus provide information on the location of a planet in the star-planet system (i.e., close to or far from its star)

The plan is to include an orrery (an apparatus showing the relative positions and motions of bodies in the solar system by balls moved by a clockwork) with observation points defined where visitors can observe planet transits and measure the drop in brightness when the planet transits the star. One possibility is to show the location of this stellar system in the Milky Way galaxy (scale goal) and compare its star with our Sun.

Recently, Kepler made it into the MSNBC list of [Top 10 Space Mysteries](#). Scroll down to number 6, "Are We Alone?", and check out the Interactive on "Other Worlds" in the left column.

Dawn Begins to Ramp Up

Dawn will orbit Ceres and Vesta, two of the largest asteroids in the solar system, in a quest to understand the conditions and processes during the earliest history of our solar system. The spacecraft and its six science instruments will spend 11 months observing at each asteroid.

Dawn was selected as a Discovery mission in December 2001. The formulation phase began to ramp up in September 2002. Recent accomplishments include the completion of staffing of flight system technical representatives for all major subsystems and elements.

Near term plans include a kick-off meeting of the science team and the first flight system Monthly Management Review to be held at industrial partner Orbital Sciences, Inc. in late January. In addition, the first project Monthly Management Review will be conducted at JPL in late January. The project plans to release their preliminary Project Implementation Plan and the Orbital Spacecraft Implementation Plan for review and to conduct a peer review of the Ion Propulsion System Implementation Plan.

Discovery Dispatch

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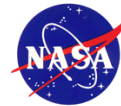
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