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DAWN heads to asteroid belt

By DC Agle and Mark Whalen

Kennedy Space Center

JPL'S DAWN spacecraft is on its way to study a pair of asteroids after a successful liftoff Thursday, Sept. 27 from the Cape Canaveral Air Force Station at 4:34 a.m. Pacific time.

Mission controllers at JPL received telemetry on schedule at 6:44 a.m. Pacific time, indicating Dawn had achieved proper orientation in space and its massive solar array was generating power from the sun.

"Dawn has risen, and the spacecraft is healthy," said Project Manager Keyur Patel. "There is not a single major issue onboard; they are all are minor and the team is not worried about any of them."

He added that the spacecraft was scheduled to have passed the moon's orbit about 26 hours after launch.

During the 80 days following launch, spacecraft controllers will test and calibrate the myriad of spacecraft systems and subsystems, ensuring Dawn is ready for the long journey ahead.

"Dawn will travel back in time by probing deep into the asteroid belt," said principal investigator Christopher Russell of UCLA. "This is a moment the space science community has been waiting for since interplanetary spaceflight became possible.

"Everyone who saw the launch was very taken by it," Russell added. "In fact, my wife cried when she saw it."

Russell noted that NASA's Discovery Program started in 1992, "which was the same year I started looking into the capabilities of ion propulsion to go out into the solar system and explore more than one body. The philosophy of the Discovery Program is to do things more cost effectively, and I realized that if we could use one flight system and explore many bodies—at least more than one—that would reduce the effective cost of doing the exploration we wanted to do."

Dawn's 4.8-billion-kilometer (3-billion-mile) odyssey includes exploration of asteroid Vesta in 2011 and the dwarf planet Ceres in 2015. These two icons of the asteroid belt have been witness to much of our solar system's history. By using Dawn's instruments to study both asteroids, scientists more accurately can compare and contrast the two. Dawn's science instrument suite will measure elemental and mineral composition, shape, surface topography and tectonic history, and will also seek water-bearing minerals. In addition, the Dawn spacecraft and how it orbits Vesta and Ceres will be used to measure the celestial bodies' masses and gravity fields.

Checkout of the instruments is underway, Russell said, but noted that the optical instruments—and to a certain extent the gamma ray and neutron spectrometer—need to view a body like Mars for accurate instrument calibration. "Just looking at a star, for example, is not enough because that only illuminates one pixel at a time and you want to look at a whole bunch of pixels illuminated at one time to do the calibration. So the first real calibration will be outbound from the Mars flyby in February 2009."

UCLA is responsible for overall Dawn mission science. Other scientific partners include Los Alamos National Laboratory, N.M.; Max Planck Institute for Solar System Research, Katlenburg, Germany; DLR Institute for Planetary Research, Berlin; Italian National Institute for Astrophysics, Rome; and the Italian Space Agency. Orbital Sciences Corporation of Dulles, Va., designed and built the Dawn spacecraft.

New mission will zero in on black holes

NASA has made a decision to restart an astronomy mission that will have greater capability than any existing instrument for detecting black holes in the local universe.

The Nuclear Spectroscopic Telescope Array, or NuStar, is managed by JPL. Led by principal investigator Fiona Harrison of Caltech, the mission will expand our understanding of the origins and destinies of stars and galaxies. NASA had stopped the study effort on the mission in 2006 due to funding pressures within the Science Mission Directorate.

"We are very excited to be able to restart the NuStar mission, which we expect to be launched in 2011," said Alan Stern, associate administrator for NASA's Science Mission Directorate. "NuStar has more than 500 times the sensitivity of previous instruments that detect black holes. It's a great opportunity for us to explore an important astronomical frontier. We are getting more and more from the science budget we have, and the restart of the highly-valued NuStar mission is an example of that."

The mission will bridge the gap between the 2009 launch of the Wide-field Infrared Survey Explorer and the 2013 launch of the James Webb Space Telescope. The spacecraft will map areas of the sky in the light of high-energy X-rays and complement astrophysics missions that explore the cosmos in other regions of the electromagnetic spectrum.

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Postdoc research showcased

Dutch Slager / JPL Photolab

Winners of the Outstanding Postdoc Research Award meet with Chief Scientist Dan McCleese, left, and Michael Gunson, Science Division deputy manager, far right. From left are Alfonso Saiz-Lopez, Bridget Smith-Konter, Franco Rappazzo and Chris Boxe.

The outstanding work of young JPL researchers was presented to the Lab community on the first Postdoc Research Day Aug. 28. Posters from 48 postdoctoral scholars showcased their contributions in Earth science, astrophysics, planetary science and advanced technology. Authors whose posters were judged to be especially outstanding received a plaque commemorating the event and later delivered Labwide lectures on their work.

Alfonso Saiz-Lopez and Christopher Boxe were honored for "Iodine Explosion During Antarctic Springtime;" Franco Rappazzo received kudos for "Heating of Solar and Stellar Coronae" and Bridget Smith-Konter was cited for "Tidally Driven Stress Accumulation and Shear Failure At Enceladus's Tiger Stripes."

Saiz-Lopez earns young scientist honors

Alfonso Saiz-Lopez has been awarded the James R. Holton Junior Scientist Award by the American Geophysical Union's Atmospheric Sciences Section.

Saiz-Lopez is a National Polar-Orbiting Operational Environmental Satellite System Preparatory Project postdoc working in the Lab Studies and Modeling Group of the Earth Sciences Section (328). His research interests include atmospheric modeling, ground-based measurements and satellite retrievals of halogen-containing molecules in the polar boundary layer, and their impact on tropospheric ozone.

Part of his research, a paper titled "Boundary Layer Halogens in Coastal Antarctica," was published in Science magazine in July.

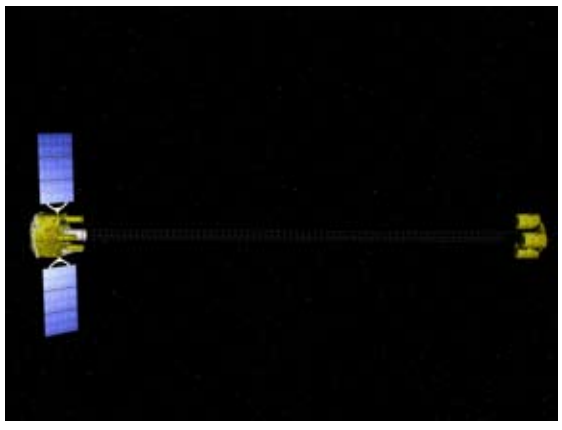
The prestigious and highly competitive award is given to a young scientist who is no more than three years past the award of their Ph.D. degree.

The honor will be presented at the American Geophysical Union's fall meeting. This is the first time the award has been made to a non–U.S. citizen; the first time an award has been made to a JPL postdoc; and the first time it has been made to a chemist.

"Halogen chemistry is a hot issue within the atmospheric community," noted the committee's citation. "Dr. Saiz-Lopez has done an impressive amount of fundamental work to address this issue. He has done experimental work, and also used both satellite information and models to attack scientific questions concerning halogen chemistry. This has led to 12 first-author papers and a total of 33 publications to his credit. This is really exceptional for someone who completed his thesis only two years ago."

NuStar

Continued from page 1



JPL is responsible for project management, project system engineering, mission assurance, oversight of the spacecraft system, instrument system engineering and instrument integration and test, said Project Manager Yunjin Kim. JPL will be responsible for delivering a laser metrology system necessary to monitor the alignment of a 10-meter deployable mast, he added.

The primary science mission will last two years.

Kim said NuStar will be the first highly sensitive focusing telescope to image the hard X-ray sky. "NuStar's unprecedented combination of sensitivity and angular and spectral resolution allows it to carry out a number of high-priority scientific investigations," he said. Among them are taking a census of black holes on all scales, achieved through deep, wide-field surveys of extragalactic fields and the galactic center; mapping recently-synthesized material in young supernova remnants to constrain nucleosynthesis and explosion models; and studying the spectra and time-variability in the most extreme active galactic nuclei.

JPL's Dave Meier and Daniel Stern are co-investigators on the NuStar science team. The pair will be specifically focusing on active galactic nuclei science and an extragalactic survey.

"For me, it is very exciting to work with Caltech," said Kim, who currently manages the Space Technology 8 mission. "I am also excited to work with the talented NuStar team members to build the most sensitive instrument in detecting black holes as a Small Explorer mission. This mission will allow us to explore deeper into the known universe to find out what may hide behind the large dust clouds that hide the interiors of galaxies. These dust clouds cannot be penetrated by our current orbiting observatories, but our Small Explorer–class mission will allow us to peer behind them for a hint of what they may be hiding."

The NuStar team is in the process of preparing for its initial confirmation review in January 2008. Following a successful review, Kim said, the project will be on a path to launch in August 2011. The preliminary design of the NuStar observatory will be completed by May 2009. The NuStar instrument will be delivered to be integrated with the spacecraft in November 2010.

NuStar includes several key university and industrial partnerships. Caltech, Columbia University and UC Berkeley will develop science instrument subsystems. The Danish National Space Center will contribute to the development of the NuStar hard X-ray optics. ATK of Goleta, Calif., will build a 10-meter mast for the NuStar instrument. The spacecraft will be developed by Orbital Sciences Corp., Dulles, Va. The science team includes members from UC Santa Cruz, Lawrence Livermore National Laboratory, Stanford Linear Accelerator Center and Sonoma State University.

NuStar originally was selected from proposals submitted in response to an announcement of opportunity in 2003. NASA expects to select three additional Small Explorer missions for flight in the first half of the next decade through a competitive selection within the astrophysics and heliophysics scientific communities.

For more information about NuStar, visit *http://www.nustar.caltech.edu.*

LOVE TO FLY

By Mark Whalen

Former JPLer preparing for space shuttle mission

Former JPL employee Stan Love, 42, is closing in on his first space shuttle flight, aboard STS-122, which is scheduled for launch in December. Recently, he spoke with Universe about the mission, his training and memories from his JPL days.

Q. STAN, WHAT MADE YOU WANT TO BECOME AN ASTRONAUT? AS A CHILD, DID YOU PRETEND THAT ONE DAY YOU WOULD BE HERE?

A. I've loved space and exploration since I was a kid. My "make-believe" games were often based on Star Trek and Star Wars, and I devoured science-fiction novels. I guess I never outgrew that interest!

Q. IT'S BEEN NINE YEARS SINCE YOU WERE SELECTED TO THE ASTRONAUT CORPS, AND IT TOOK SEVERAL TRIES BEFORE YOU WERE ACCEPTED. FROM ALL INDICATIONS, ARE YOU GLAD YOU STUCK WITH IT ALL THIS TIME?

A. It has been a long wait to fly . . . but they say that life is what happens while you're waiting for something else. While I was applying to be an astronaut, I finished my Ph.D. at the University of Washington in Seattle, did some interesting science at the University of Hawaii in Honolulu and at Caltech, and enjoyed learning to be an engineer at JPL. Since joining the astronaut office, I've participated in three years of space flight operations as a Capcom in Mission Control, gone to Antarctica for two months to collect meteorites and helped develop the conceptual design of the future Orion spacecraft and its launcher. Those were all amazing experiences . . . so I think the time was well spent.

Q. WHAT HAS BEEN THE TOUGHEST ASPECT OF YOUR TRAINING OVER THE YEARS? WHAT'S BEEN THE MOST FUN?

A. For me, the toughest part of training has been learning to work as a very tight-knit team. On the shuttle we don't even throw a switch without a crewmate watching to make sure we're doing it right! That's different from much research and engineering, where we work alone at least part of the time. The most fun part so far was a trip to Alaska for outdoor teamwork training in a harsh environment. Instead of being harsh, though, the weather was perfect for 10 straight days, so we all had a great time.

Q. WHAT KINDS OF ADVICE HAVE YOUR FELLOW ASTRONAUTS GIVEN YOU? DO YOU THINK YOU WILL BE NERVOUS AT LAUNCH?

A. I've gotten all kinds of advice, but I commonly hear reminders to make time in the extremely busy on-orbit work schedule to appreciate being in space. I'm sure I will be nervous at launch; who wouldn't be?

Q. YOUR FLIGHT WILL DELIVER THE EUROPEAN SPACE AGENCY'S COLUMBUS LABORATORY TO THE INTERNATIONAL SPACE STATION. WHAT IS THAT LAB ALL ABOUT? HOW LONG WILL YOU AND THE ATLANTIS CREW BE AT THE STATION?

A. Columbus is the European Space Agency's main hardware contribution to the space station. Once it's in orbit, European astronauts can make more long-duration flights on station. Columbus is a module dedicated to scientific research. It will greatly expand the amount of real science we can do on station. My crew and I will spend about a week docked to station. We'll pull Columbus out of the shuttle payload bay and attach it to the station using the station's robotic arm, do three spacewalks and outfit Columbus inside and out.

Q. WHAT WILL YOUR ROLE BE AS A MISSION SPECIALIST?

A. My main tasks are to operate the shuttle and station robotic arms and to make one spacewalk.

Q. WHEN YOU WERE AT JPL YOU WORKED ON DEVELOPING NEW METHODS TO ESTIMATE THE CONDITION OF SPACE TELESCOPE OPTICS, APPLYING THOSE TECHNIQUES TO THE HUBBLE SPACE TELESCOPE, AND YOU ALSO WORKED ON PROCESS RE-ENGINEERING. DID YOUR EXPERIENCE AT JPL GREATLY INFLUENCE OR BENEFIT YOUR FUTURE AS AN ASTRONAUT? WHAT ARE YOUR BEST MEMORIES OF WORKING AT JPL? DID CERTAIN PEOPLE SERVE AS A MENTOR OR IN SOME WAY ENCOURAGE AND HELP YOU TO WHERE YOU ARE TODAY?

A. The work I did at JPL involved planning, design and analysis. Astronauts work in operations, so my experience here has complemented (rather than built upon) what I learned at JPL. It's hard to pin down a "best" memory of working at JPL. I had a great time the whole time I was there! But I especially enjoyed being in an exciting, forward-looking work environment where innovation was treasured. I received great mentoring from Joel Sercel, who opened the door, from Ray Wall, who found a place for me to fit in and from Dave Redding, who taught a former astronomer about the interesting things that happen between the primary mirror and the detector.

Q. WITH THE RETIREMENT OF THE SPACE SHUTTLE IN A FEW YEARS, IS IT POSSIBLE THAT STS-122 MIGHT BE YOUR ONLY SHUTTLE FLIGHT? ALONG THOSE LINES, HAS ASTRONAUT TRAINING CHANGED IN STEP WITH THE DEVELOPMENT OF THE CREW EXPLORATION VEHICLE? IF NOT YET, WHEN WILL THAT TRANSITION TAKE PLACE, AND DO YOU EXPECT TO BE ELIGIBLE FOR A FLIGHT ON ORION? COULD A TRIP TO THE MOON BE IN YOUR FUTURE?

A. Yes, it's possible that this could be my only shuttle flight. I won't know until after it's over whether a second one could be in the cards, and my future career will be a decision my whole family will participate in. I expect to be eligible to fly on Orion when it starts flying. As for a trip to the moon, that would be a treat! But those flights are too far in the future for me to make any concrete plans.

Astronaut training has not yet begun changing for Orion, although people are beginning to think about what adaptations might be needed. Spaceflight crews usually begin training a year or two before flight, and the first piloted flight of Orion is a few years away. There is still plenty of time to design and build the vehicle before we have to work out what training a person needs to fly it.

Q. WHAT HAVE YOU TOLD YOUR CHILDREN ABOUT THE FLIGHT? WOULD YOU ENCOURAGE THEM TO EXPLORE SPACE WHEN THEY'RE OLDER?

A. I've told my two school-age kids that daddy will be in space for about two weeks, and that it's about as dangerous as working on an Alaskan fishing boat or doing a tour of duty in Iraq. When they're older I would encourage them to explore space. By then it will be a different game: safer, more workaday, less glamorous. If they're interested, they're welcome to it. But I think it's even more important to encourage them to explore in general. Space is cool, but there is also plenty of coolness in the oceans, in the Arctic . . . and in biology, history, literature and music. It's all worth exploring.

News Briefs

Stephanie Wilson

Barbara Wilson

Wilson heading to space again

Astronaut and former JPL engineer Stephanie Wilson is preparing for her second space shuttle flight.

Wilson will be a mission specialist and lead robotic arm operator on STS-120 aboard Space Shuttle Discovery, scheduled to launch Oct. 23. The mission will deliver to the international space station an Italian-built U.S. module called "Harmony," an internal connecting port and passageway to additional international science labs and cargo spacecraft. The pressurized module will increase the living and working space inside the station and serve as a work platform outside for the station's robotic arm.

She operated both the space station and shuttle robotic arms during the STS-121 mission in July 2006.

Wilson joined the astronaut corps in 1996 after four years at JPL, where she was an attitude control engineer on the Galileo mission and supported the Interferometery Technology Program as a member of the Integrated Modeling Team.

Wilson gets Air Force honor

Barbara Wilson, chief technologist for JPL's Earth Science Instruments and Technology Office, has been named for the second time a recipient of the "Decoration for Exceptional Civilian Service," the highest award granted by the Secretary of the Air Force to Air Force civilian personnel.

Wilson recently completed a four-year stint with the Air Force's Science Advisory Board, where she served as chief scientist and chaired external reviews of the science and technology program.

A JPL employee since 1988, Wilson has served as JPL's chief technologist and as deputy manager of the New Millennium Program. She is also a fellow of the American Physical Society and a member of the American Institute of Aeronautics and Astronautics.

Paper earns Japan kudos

The Robotics Society of Japan has selected a JPL-authored paper as a recipient of their "Best Paper Award" for 2007.

"Slip-Compensated Path Following for Planetary Exploration Rovers" was published in the journal Advanced Robotics in November 2006. The authors are Daniel Helmick, Yang Cheng, Daniel Clouse, Max Bajracharya, Larry Matthies and Stergios Roumeliotis. Helmick was the lead author.

The paper, written about research performed under a Mars Technology Program task called "Navigation on Slopes," describes a system that enables a rover to accurately follow a path in high-slip environments. It is designed to increase rover mobility and maneuverability with the goal of allowing scientific access to slopes, channels, layered terrain, putative shorelines and fluid seeps. It uses stereo imagery to estimate motion independent of mechanical terrain properties using a technique called visual odometry.

Advanced Robotics is the international journal of the Robotics Society of Japan. More than 100 journal papers are considered for the honor each year.

Award ceremonies were held Sept. 14 in Chiba, Japan.

Spitzer scientist honored

The National Women's Hall of Fame has selected a Spitzer Space Telescope astronomer to join its ranks. Judith Pipher of the University of Rochester, N.Y., helped develop Spitzer's infrared array camera, which continues to unveil the cosmos.

The organization will hold its 2007 induction Oct. 6 and 7 in Seneca Falls, N.Y. Nine distinguished American women will be inducted into the Hall for their significant contributions to society.

Pipher's research in the field of infrared astronomy began in graduate school with work on some of the first rocket-borne telescopes. Since 1971, Pipher has served on the faculty of the University of Rochester, where she and her colleagues were the first U.S. astronomers to turn an infrared array toward the skies. Her experiments with ground-based and airborne telescopes culminated in development of a camera for, and infrared observations on, the Spitzer Space Telescope, launched in 2003.

Hall of Fame inductees are selected by a national panel of judges for their contributions to the arts, athletics, business, education, government, humanities, philanthropy and science.

JPL Store opens off-Lab kiosk

In order to better accommodate Laboratory visitors, the JPL Store has opened a new location in the Visitor Control area, Building 249.

The new store will be open 9 a.m. to 4 p.m. Monday through Friday (except regular day off Fridays) and will sell assorted JPL and NASA mission merchandise and other souvenirs. Tickets, bus tokens and computer items such as iPods will not be offered.

New book on Pickering

The NASA History Office has published a new book on the life and times of former JPL Director William Pickering.

The book, "William H. Pickering: America's Deep Space Pioneer," is due out in December in time to mark the 50th anniversary of the launch of Explorer 1 in January 1958.

The book's author is JPL retiree Douglas Mudgway, who also wrote two earlier books related to JPL: "A History of the Deep Space Network" and "Big Dish," on the building of the network's 70-meter antennas.

Mudgway, a native of New Zealand as was Pickering, said the book is being distributed throughout that country's education system by a national professional society as a memorial to their native son.

For a preview, visit *http://history.nasa.gov/nltrc.pdf.*

Service awards bestowed

For the period of July to September 2007, the following JPL recipients celebrated 25 or more years of service and were invited to attend a luncheon and ceremony in their honor on Sept. 12.

50 years: John Casani.

45 years: Arvydas Kliore.

40 years: Bruce Conroy, John Rohr, W. Van Snyder, William Weber.

35 years: Jacqueline Akers, Camille Hayes, George Purcell, E. Standish, Bruce Tsurutani, Gene Wester, Chen-Wan Yen.

30 years: Robert Barry, William Blume, Robert Cesarone, Minoo Dastoor, Govind Deshpande, Jean Dickey, Robert Easter, Satish Khanna, Bruce McLaughlin, Ronald Reeve, Annie Richardson, Eddy Shalom, Robert Staehle, Jan Tarsala.

25 years: Susan Argenio, Michael Blakely, David Brinza, Magdi Carlton, James Dillion, Carolina Flores-Helizon, Frank Kuykendall, Robert Laskin, Roger Lighty, Farzin Manshadi, Scott Markham, Linda Munoz, Laurence Reinhart, Jerry Suitor, Arthur Thompson, Robert Treuhaft, Duc Vu, Leslie White, Brian Wilcox.

For information about the programs and services offered by Compensation, Rewards and Recognition, visit *http://hr/esr.*

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Passings

Ruth Douglass, 88, retired from Section 614, died Feb. 26, 2007.

Douglass joined the Lab in 1980 and retired in 1985. She is survived by nine children, 30 grandchildren and 12 great grandchildren.

Everett DeView, 91, a former photographer and supervisor of photographic services, died Aug. 13.

DeView joined JPL in 1957 and retired in 1979. He is survived by his wife, Janet; sister Irene; daughters Bethney, Yvette and Mary; and stepdaughter Bonnie.

Services were provided at sea by the Neptune Society.

Robert Rydgig, 77, a retired technical group supervisor in Section 3333, died Aug. 15.

Rydgig worked at the Lab from 1964 to 1996.

Ferdinand Allen, 59, a retired electrical engineer and systems engineer in the Facilities Division, died Aug. 29.

Allen worked at JPL from 1973 to 1997. He is survived by his wife, Bertha, and son Tony. Services were held in Alexander, La.

Letters

Thank you to everyone at JPL for your kindness and words of comfort during my father's illness and death. Thanks too for the exquisite plant. My dad loved flowers, particularly orchids, so it is a wonderfully appropriate tribute to him. All your support is deeply appreciated.

Cate Heneghan

I want to express my appreciation for the lovely floral plant and thoughtful notes of sympathy on the passing of my mother. My family and I were moved by the generous spirit of the JPL community during a difficult time.

John Kelly

As a relatively new member of the JPL community, I would like to express my appreciation to JPL for the support and understanding this last year, as we dealt with the declining health and eventual passing of my mother-in-law. The purple orchid that was sent to us is a wonderful reminder of her life, which was also one of her favorite plants. JPL's kindness has been a great comfort during a difficult time. Thank you, it is truly amazing to be a part of the JPL family, and working with an organization that reaches out in support when it is needed most. With kindest respect and great appreciation,

Jamie Holguin

I would like to thank everyone at JPL who has offered kind and thoughtful words after the passing of my mother. Your condolences during this difficult time have been a comfort. I also very much appreciate the plant that serves as reminder that life will go on. Thanks again.

Matthew Bennett

I would like to extend a heartfelt thank you to all my friends at JPL for their cards of encouragement, the flowers that were so beautiful, and most especially your prayers during my illness over the last four months. I am not out of the woods yet, but I am getting better every day. My family and I are so thankful to have such loving and loyal friends. Thank you.

Mary Reaves and family

We want to express our sincere appreciation to the JPL community for your words of encouragement and kind expressions of sympathy after the passing of our father/grandfather, Robert Klein. He leaves behind five children, nine grandchildren, 10 great-grandchildren and a multitude of fond memories. The beautiful plants and the cards we received were heartfelt and greatly appreciated. Thank you for your support.

David and Maria Klein, Mary and Mark Romejko, Julia Curtright, Nichole Vlcek & Jennifer Dioguardi

Retirees

The following JPL employees retired in October:

Roger Okamoto, 47 years, Section 3754; **John Slonski**, 42 years, Section 313; **Grace Joy Hodges**, 41 years; Section 781; **Shirley Stroup**, 40 years, Section 3112; **Ted Peng**, 35 years, Section 912; **Ramachandra Manvi**, 33 years, Section 354; **Donald Strayer**, 24 years, Section 3544; **Jean Patterson**, 23 years, Section 333.