Scrimmage teaches students good lessons

By Gia Scafidi

A crowd looks on as student-built robots compete at JPL.

High school students from across Southern California exemplified the true meaning of teamwork and perseverance at JPL’s first robotics scrimmage, held May 25 and sponsored by the Laboratory’s Robotics and Mars Exploration Technology Program.

Nine student teams, all members of the FIRST (For Inspiration and Recognition of Science and Technology) program, showed off their engineering talents while they piloted their robots to shoot balls into metal hoops. The remotely controlled robots, about 4 feet tall and able to extend up to 10 feet, were designed, constructed and tested entirely by the students, with professional engineers mentoring along the way.

Organizers of the scrimmage hoped to raise JPL’s excitement and interest in FIRST’s robotics competitions.

“I can’t begin to tell you what an impact this program has had on [the students’ lives],” said Tom Campbell, coach of the Bell High School’s “Screaming Eagles” team. “Not only have they experienced the trials and thrills of competition, but, most importantly, they’ve had a chance to experience much wider intellectual and geographical worlds than they had ever dreamed of.”

“It’s fantastic because everybody involved brings different strengths and talents to the table,” said Dave Monteros, department chair of electronics and coach of the Don Bosco Technical Institute’s “Critical Mass” team.

Established in 1992 as a non-profit organization, FIRST was created to generate high school students’ interest in science and technology. Its robotics competitions serve to “inspire curiosity … in today’s youth by immersing them in the world of engineering.” Teamed up with engineers from businesses and universities, students get a sneak peek into the engineering world during an intense six-week preparation period before the annual competitions.

“This has opened up many opportunities for us,” said Michael Pena of Bell High School. “Colleges recognize this program and we’ve learned a lot about trial and error.”

Every year, four regional competitions are held throughout the United States in early spring, while the nationals take place on a grander scale in April at Disney’s EPCOT Center in Orlando, Fla. Last year, more than 15,000 students, forming 350 teams, battled their robots for the nation’s championship title.

To prepare for the competitions, students must collaborate to transform a box of parts (without any directions) into their robotic visions, as well as raise the necessary funds for a team’s involvement. “Soliciting a private sponsor is one way to overcome some of the financial responsibilities, which can easily range from $10,000 to $50,000,” said Robert Steele of JPL’s Autonomy and Control Section 345, the scrimmage coordinator and FIRST task manager.

In the end, students come into the no-holds-barred competitions understanding the connection of classroom lessons and real-world applications, as well as the importance of teamwork, organization and deadlines.

“This program allows students to participate in an end-to-end project, which most of them have never done,” said Dr. Samad Hayati, manager of JPL’s Robotics and Mars Exploration Technology Program. “The fact that they work with students, teachers and professional engineers also gives them a sense of the interaction that takes place in real-world working environments.”

This year’s scrimmage consisted of five-game matches, each of which had four high schools paired into “alliance” teams. Points were based on the color of a ball that landed in the hoops. “To avoid 100-to-0 matches, the winning team of each match was only awarded three times the points of the defeated team,” explained Steele.

Two high schools came away with grand prizes. After semi-final and final matches, the alliance of the Hope Chapel Academy’s “Beach Bot 2000” team and Newbridge High School’s “Team Funkatron—Starring Super Chimp” team came out on top. They were both presented with plaques from JPL.

“At the beginning of the year, we all thought this was a full-on battle,” said Daniel Winston, member of the Granada Hills High School’s “Robodox” team. “But the whole alliance team concept helped us realize that we can get ideas from each other because every team has different strengths. It benefits all of us if we work together.”

Next year, JPL plans to provide seed money for 20 Southern California high school robotics teams to participate in FIRST’s competitions. The Laboratory is encouraging JPLers to participate in the program, as a variety of talents is needed for this event, Steele said.

Electronic nose is nothing to sniff at

Device will aid shuttle, space station crews

By Nancy Lovato

The E-Nose was developed to sniff out a number of toxic compounds to aid space crews in detecting chemical leaks, solvent spills and electrical fires.

Scientists are expanding the sensitivity of a JPL-developed “electronic nose,” while shrinking its size to make it more compact for future space missions following a space shuttle flight that successfully demonstrated the technology.

“The E-Nose was able to determine changes in humidity accurately, which we confirmed using an independent humidity monitor in the shuttle cabin,” said Dr. Amy Ryan, principal investigator for E-Nose at JPL. “While we would have liked to monitor any of the 10 common contaminants the E-Nose was trained to smell, fortunately for the crew none was detected. That was confirmed with air samples brought back in canisters from the flight.”

The ability to monitor recycled air is very important to the space program, especially in closed environments such as the space shuttle, the international space station and any future space outpost that features a closed human habitat. Early detection of potentially harmful spills or leaks is essential so that crew members can immediately take action to remedy the situation. Even if a human nose could detect every possible odor and identify it, fatigue or a cold would impair the nose’s sensing ability.

“Space crews are very, very busy,” said Ryan. “Anything we can do to automate their tasks and keep the space habitat safe is highly desirable. Now we need to further develop E-Nose’s capability to detect various odors and differentiate between those that signify danger and those that do not. We are working with people at other NASA centers to optimize this technology.”

Since there are limits on size and power requirements in constricted quarters, miniaturization is important. The unit flown in fall 1998 on STS-95 is only about the size of a large paperback, weighs 1.4 kilograms (about 3 pounds)—including the operating computer—and uses an average of 1.5 watts of power.

Dimensions are 18.5 by 11.5 by 12 centimeters (7-3/4 by 4-1/2 by 4-3/4 inches).

“Our current efforts are directed toward improving the sensitivity of the E-Nose, expanding the compounds we can detect from 12 to 24, and making the unit even smaller,” Ryan said. “Decreasing the size and weight will be pretty straightforward, since the shuttle’s space allocation requirements dictated the special box we used for that flight.”

A major application that JPL scientists are pursuing is the detection of a fire before the blaze erupts. Fires can smolder in closed environments, such as insulation in paneling or around wires, for some time before flames actually appear. With early detection, the fire can be extinguished safely before much damage occurs. The many potential commercial uses include “sniffing” for unexploded land mines, for spills in chemical plants that could contaminate workers, for plant ripeness to harvest at the desired point in the agricultural cycle, and for possible diagnosis of disease based on odors from human perspiration and breath.

The JPL E-Nose flew on the shuttle used sensor technology from Caltech.
Nasa partners to use HDTV, digitize images

NASA has established a corporate partnership that includes provisions to provide, for the first time, high-definition television coverage of astronaut activities aboard the international space station and on shuttle missions.

The agency's agreement with Dreamtime Holdings Inc. will also create a web searchable, digital archive of imagery from JPL and all other NASA centers.

The agreement will also provide JPL with high-definition television cameras, monitors, editing equipment and other support equipment within the next year.

Dreamtime headquarters will be in leased space located at Nasa's Ames Research Center in Moffet Field, Calif.

The NASA-Dreamtime partnership will create a state-of-the-art multimedia portal, www.Dreamtime.com, that will provide thousands of images, sounds, documents, blueprints and plans from NASA's currently underused archives. Content will be accessible via web, wireless, TV and interactive TV devices. Rollout of the in-depth portal site will begin within the next several months.

The partnership's first priority will be to create the Dreamtime.com portal, which will combine video, audio, still photographs, high-resolution images, historical documents and three-dimensional views of spacecraft such as JPL's Mars Pathfinder Sojourner rover and the Hubble Space Telescope. The portal will also include space topic-related bulletin boards, educational activities and games, chat rooms and e-cards. Educational content planned in documentary and TV broadcasts will be linked to modules in the portal.

The U.S. Congress declared commercial utilization to be one of the primary goals of the U.S. space program when it passed the 1998 Commercial Space Act and directed NASA to actively seek commercial users for the space station. NASA publicly solicited offers for commercial collaboration from the public in December 1999, stating its intent to partner with the private sector to create new market opportunities in the multimedia arena. Dreamtime was selected from 12 offers based on criteria published in the announcement.

The term of the agreement between NASA and Dreamtime is for seven years with a five-year option.

Small-business owners and business representatives brushed up on their success skills last month at JPL's second annual Small Business Roundtable Conference, sponsored by JPL, NASA and the Small Business Administration (SBA).

More than 100 attended the May 12 event, which included a panel of speakers from JPL, the SBA, OAO Corp., Lockheed Martin and the California Small Business Administration, and stressed the importance of SBA certification and strong business relationships. Members of JPL's Technical and Business Affairs divisions also met with attendees.

"We conduct the conference to give small businesses, especially small disadvantaged businesses and women-owned businesses, the opportunity to network and learn how to market NASA and other prime contractors in the space industry," said Mel Roberts, principal for acquisition operations and planning in JPL's Engineering and Science Directorate. According to Roberts, every year JPL's Acquisition Division contracts $200 million of small business contracts.

A formal certification of small disadvantaged businesses, part of the Clinton administration's program to expand opportunity for socially and economically disadvantaged businesses, allows small business owners to be eligible for preferences under recent federal procurement regulations. Fay Graybeal of Lockheed Martin Aeronautics confirmed that certified business owners are recognized in the industry. "Every contract bid that Lockheed Martin gets must have at least one small disadvantaged business and one woman-owned business on it," she said. Beyond partnering with large prime contractors, the panelists advised of the benefits of joining forces with other bidders for industry contracts. TRW representative Al Bolden said that when the government uses fewer contracts in order to lower administrative costs as in the present situation, market opportunities may improve when a business has teammates.

Representatives from Caltech, USC, the Los Angeles County Department of Water and Power, Aerojet, and Dryden Flight Research Center were also on hand for questions and networking opportunities.

Employee accomplishments noted with an Award for Excellence

Ceremonies were held May 11 to honor recipients of JPL’s Award for Excellence. The awards recognize a specific accomplishment or sustained contribution by individuals and teams that is clearly characterized by exceptional technical excellence, business-operations excellence, quality or leadership. The ceremony recognized contributions between Dec. 1, 1998 and Dec. 10, 1999.

A list of award recipients follows.

Individuaals

Business Operations

Penny Carter-Lockert (194), Kenneth Govey (644), Jennifer Hesser-Amiri (220), Sharon Kyle (252).

Leads

Richard Brice (500), Artur Cmielwski, (350), Zelizer Cuneo-Snodd (220), Joanne Holm (174), James Lamb (346), Marc Montgomery (220), Kenneth Neaustin (3251), Valerie Thomas (344), Philip Varghese (902).

Quality

Irene Chan (124), Robert Dower (383), Philip Yates (351).

Technical

Mark Anderson (3331), Edward Cutddiey (3334), Daniel Edred (341), William Hurz (905), Terry Scharberry (352), Thomas Skipper (311).
JPL WELCOMES 40,000 VISITORS

About 40,000 people visited JPL's annual open house June 3 and 4, enjoying the wide variety of displays and attractions.

Clockwise from left: A prototype rover at the Mars Yard; a “fisheye” view of the space simulator in Building 150; viewing the sun through a special solar telescope; checking out rocks and other Earth materials through magnifying glasses; and kids hard at work building model spacecraft.

Photo credits, clockwise from top left: Dutch Slager, Richard Hasegawa, Richard Hasegawa, Tom Wynne, Richard Hasegawa.
PAssings

CLIFFORD CASABIANCA, 86, a retired aerospace engineer who moved to Glendora in 1990, died of cardiac arrest May 9 at his home in Tujunga. Casabianca, who served in the Navy during World War II, was employed at Rockwell International, where he worked 33 years, before retiring. He was predeceased by his wife, Therese. Services will be held at noon Tuesday at Our Lady of Perpetual Help Catholic Church, 2121 Glendora Ave., Glendora. Contributions may be made to Boys & Girls Club of Glendora, 205 W. Glendora Ave., Glendora 91740.

Similarly, staff

For Sale


BABY ITEMS; ski parka, lamp, dark blue snow pants, $40. (626) 443-3591.

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