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R E L E A S E

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Student Researcher Wins Local Fair and Advances to International Science Competition

When faced with a challenge like attempting to determine the lift of a wing he designed, high school student Justin Spahn wasn't deterred by the fact that the school's wind tunnel was available, but broken: he immediately decided to build his own wind tunnel, using homemade parts and a fan used to inflate his school's portable planetarium. Spahn completed his wind tunnel and data collection just in time for the 2007 Contra Costa Science and Engineering Fair, held at Heald College in Concord, California on Saturday, March 24. Spahn won a first-place rating for 12th grade at the fair, a rating which is based on the number of points he earned for his display and his interview by a panel of judges. He also won the Grand Prize at the fair, and, along with a student from DeLaSalle High School, will represent Contra Costa County at the Intel International Science and Engineering Fair in Albuquerque, New Mexico, in May.

"My teacher listed a bunch of characteristics of wings such as chord length, camber ratio, and so on," Spahn said in response to a query about how he started his project. "I picked the one I knew least about and began reading about it." Soon he settled on camber ratio, which is defined as the ratio of the thickness of a wing to its length from leading to trailing edge. Using a force sensor from the school's physics lab, a wind speed meter left over from a previous project, and hand-sculpted aircraft wings, Spahn assembled a functional wind tunnel and measured the lifting force of several wings using a computer in a little-used storeroom near the school library. Spahn's results showed that thinner wings tend to produce better lift, all other factors being equal. He was surprised to discover that exceptionally thick wings not only did not provide lift, they actually deflected air upward and provided downward force on his sensor rather than upward force. "It's like trying to fly a brick wall," he said. "The air flow is not smooth and no lift is generated."

Spahn also received a 2nd place award from the Northern California Chapter of the American Vacuum Society and a check for \$50. In addition to his other awards he also received the Herbert Hoover Young Engineer's award.

Other students at Deer Valley's ESPACE Academy (Earth, Space, and Astronomy Center for Education) fared well at the fair as well. Joseph Smith, also at senior at Deer Valley High School, won a 2nd place prize for his project called "The Game of Life in Java," which showed the evolution of cells in a virtual Petri dish, programmed in the Java programming language. Smith will be releasing his source code on the academy web site as soon as he prepares an open-source license for it. Smith also received an award certificate from Intel for Excellence in Computer Science.

ESPACE Academy

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The lone team entry from the school won the 11th grade first place prize. Juniors Alekzandir Morton, Thomas Travagli, and senior Manutej Mulaveesala won with their project "A Galaxy Ablaze from Afar," which detailed their use of data collected from both ground-based telescopes and the Spitzer Infrared Space Telescope to determine what kind of radiation is emitted from a distant blazar, or a galaxy which is being torn apart by a titanic black hole at its center.

The astronomy project was sponsored by the Spitzer Science Center at Cal Tech, and the National Optical Astronomy Observatory in Tucson, Arizona. The students used a remote-control telescope in New Mexico and data from the Spitzer Infrared Space Telescope, which orbits the sun millions of miles from the earth to complete their research. In addition to the 1st place prize in their grade level the young men also received a medallion from the Yale Science and Engineering Association for Most Outstanding 11th Grade Exhibit in Computer Science, Engineering, Physics or Chemistry.

The school's first-ever earth science entry was completed by junior John Dawson, who won a \$150 prize from the Golden Gate Section of the Society of Petrochemical Engineers for his research on the transmission of earthquake energy through the various materials underlying Deer Valley High School. Dawson used an accelerometer to detect the transmission of energy through samples taken from the school's campus to show that sandstone absorbs the energy of an earthquake better than more rigid materials.

Most of the students are enrolled in Deer Valley's Physics and Astronomy Research class, a special course offered by the ESPACE academy and supported by the Antioch Unified School District. The teacher of the course and advisor to the students is Jeff Adkins. "These young men put in literally hundreds of hours of work on these projects," according to Adkins. "The level of work is comparable to what a college student would do as part of an undergraduate research project. I'm very proud of all of them and appreciative of the support from their parents and the district," he said.

About the Contra Costa County Science and Engineering Fair

Contra Costa businesses joined with K-12 educators to establish an Intel-affiliated Science & Engineering Fair in Contra Costa County in 2006. The second annual event was held on March 22, 23 & 24, 2007 at Heald Conference Center in Concord.

An Intel ISEF-affiliated science fair is a science competition that is a member of the Intel ISEF network. These competitions exist in every state in the U.S. and 40 countries. All Intel ISEF-affiliated science fairs register with Science Service and must consist of five participating high schools or 50 students in the 7th-12th grades. Fairs are conducted at local, regional, state and national levels. The winners of the Contra Costa Science & Engineering Fair (CCSEF) go on to compete in the International Science & Engineering Fair each spring. In 2007, the International Fair will be held in Albuquerque, New Mexico on May 13-19. For more information visit <http://cceconptnr.org/ScienceFair/>.

About the ESPACE Academy

The Deer Valley High School ESPACE academy was founded in 2001 with a grant from the California Department of Education's Specialized Secondary Grant program. The academy promotes student achievement through completion of significant projects in research and outreach. Research projects include award-winning science fair projects utilizing computers, space probes, telescopes, and a great variety of other astronomy and physical science projects. Outreach projects include planetarium shows conducted in the school's on-campus digital planetarium and the Antioch Unified School District's portable Starlab planetarium. Academy student project results, curriculum, and research is posted at the academy web site, <http://www.ESPACEacademy.com>.

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