

Underwater Robots

Deep areas of the ocean have extremely high pressures, extreme temperatures, and are very remote. To safely explore the deep sea, scientists use underwater robots to learn more about Earth. Since robots do not breathe, they are safer to use than divers and more cost effective for studying oceanic animals, plants, rocks, deep sea volcanoes or hydrothermal vents, and more. Scientists use various cameras and research equipment on underwater robots to collect information about this watery world. During each dive, the robots collect pictures and samples, which allow scientists to learn about what lives in the deep sea and what these animals observe on a daily basis.



SENTRY brought back on board. © WHOI

Scientists use a variety of robots for ocean exploration. An ROV, or remotely operated vehicle, is controlled by a pilot on a ship. The ROV is connected to the ship by a long cable and is steered using a remote. ROVs typically have a camera and a light to record what they see. ROVs have recorded some amazing videos and have allowed us to study deep sea animals, volcanic explosions, oil spills and more! This type of technology was critical in capping and assessing the oil spills in the Gulf of Mexico.

Sentry is a robot that moves

completely on its own without a cable or a pilot. Instead, scientists and engineers use program Sentry to complete different missions in the deep sea. Sentry is designed to move forward, backward, side to side, and diagonal. It can move at many speeds over underwater mountains and into trenches, mapping the seafloor along the way. Like many of these robots, Sentry is made up of computers, metals, wires, power (batteries), and electricity. Sentry also has thrusters for movement. Sentry has aided in mapping the topography or features of the seafloor.

Research submersibles typically take three people down to the bottom of the ocean. Scientists use robotic arms on the outside of the submersible to collect samples and use different kinds of equipment to test temperature, chemicals, and more



ALVIN, submersible © WHOI

in the deep sea. A dive in a submersible is about eight hours long. Like a trip to the moon, scientists who use submersibles can experience the deep sea in person, exploring this unusual environment with their own eyes, rather than through a camera on an ROV. One of the most famous submersibles is ALVIN, which has

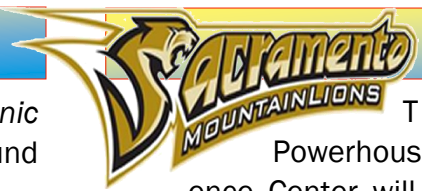
explored the wreck of the *Titanic* and hydrothermal vents around the world.

Through this technology, researchers have found life thriving in extreme environments around these hydrothermal vents. Since temperatures are in the thousands directly at the vents and near freezing surrounding the vents, animals have to be highly adaptive. Animals here get energy through chemosynthesis, producing food by use of chemicals spewing out of the Earth: nitrates, sulfides, and phosphates. Whole alien-like communities exist here. Understanding how they live in extreme environments can assist humans to develop means of living in a changing world. Many of these creatures and environments could provide new chemicals to help us

fight diseases. These robots are aiding us in gathering life-changing information and more knowledge on how the Earth works.

Is your child interested in robotics, space or ocean exploration? Check out the new Robotics Lab at the Discovery Museum, where your child can begin learning the basics of robotics and gain skills for the future.

By museum volunteer Sabreena Kasbati & Kris Ludwig



UFL Football

The Powerhouse Science Center will have a little football power behind us this Fall. The Sacramento Mountain Lions, of the United Football League, have selected the Powerhouse Science Center as their featured charity for their home opener. "The Mountain Lions have brought a level of excitement to our region and we want our members and supporters to help us capitalize on that momentum," said Peter Willson, director of development for the Powerhouse Science Center. "Here's an opportunity to show our enthusiasm for football AND science - what a powerful combination!" The opening game is set for

September 10th. The Mountain Lions are happy to be on the Powerhouse team. "Personally, I can't wait to take my family to the new science center once it's completed," said Joe Wag-ner, vice president of business operations for the Mountain Lions. "This is a great way to kick off our charity program this season. We had a good experience supporting the Powerhouse Science Center last year, and we hope it's even better this year."

For more information on how YOU can support both the new science center and the Mountain Lions by purchasing tickets to the September 10th Mountain Lion season opener, please call (916) 808-3942.

HSC Conference 2011
ADVENTURES
HOMESCHOOLING

August 4-7 2011
Radisson Hotel, Sacramento, CA
 Featuring: Bev Bos, Jim Weiss, Wes Beach, Blake Boles, and much more!
www.hsccconference.com

The HSC Adventures in Homeschooling Conference will be held at the Radisson Hotel, 500 Leisure Lane, Sacramento, CA, on August 4th-7th.

Stop by the Discovery Museum Science & Space Center booth at the HSC Conference to learn about our upcoming exhibits and events!

Admission to the 10,000 square ft Exhibit Hall with over 50 vendors is FREE!

Exhibit Hall Hours are: Friday - 8/5 from 12pm-8pm and Saturday 8/6 from 9am-6pm. Recycled Resource Room - Saturday 8/6 from 7am-3:30 pm. For more information and full registration, visit www.hscconference.com.

Curves Smart, Quiznos SUB, STRAW HAT PIZZA, The Paper Garden, DISCOVERY MUSEUM Science & Space Center Members Welcome, Color Me Mine, BUCHI di BEPPO Italian Restaurant, Big Spoon Yogurt, JIMBOY'S TACOS.

Participating Merchant Partner

For a complete listing of participating Merchant Club business locations, please visit our website at www.TheDiscovery.org.

Visitors had a wonderful time during our Captain America film promotion this past July!

CAPTAIN AMERICA



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We're on the Web at
www.thediscovery.org



Science Discovery Weekends - Weekends 12:30pm to 4pm

CELEBRATING SCIENCE

MILESTONES OF THE 1980's

AUGUST 6TH & 7TH - OUR SISTER PLANET

Throughout the last few months, the Discovery Museum has been celebrating 60 years of sensational science milestones. One such momentous occasion was Venera-13 completing the first Venusian soil analysis in 1982. Venus, our sister planet, will be highlighted in our classroom and in the *Space Quest!* exhibit. Paint your very own Venus to take home.

AUGUST 13TH & 14TH - COSMIC CUISINE

In the 1980s, artificial sweeteners were focused on for public consumption. Did you know these chemical compounds were originally developed by NASA for astronaut food? Visit this weekend and use triple-beam balances to weigh foods. Discover why artificial

sweeteners are advantageous for space travel. Sample some ice cream and Tang that astronauts would eat.

AUGUST 20TH & 21ST - BOTS IN ACTION

Robots have made many things possible that humans could not do on their own. This includes the exploration of the Titanic in 1985. Kids 12 & under have fun creating paper robotic grabbers. Test your abilities picking up different objects, then take your grabber home.

The Discovery Museum will be closed from Aug. 22nd to Sept. 2nd for exhibit upgrade. The Museum will re-open on Sept. 3rd with a new display in the Nature Discovery Room, the Cosmic Café (a toddler play area where all the out of this world "astronauts" dine) and new additions to our *Space Quest!* exhibit.

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Challenger Learning Center

2011 Community Mission Schedule



(For ages 9 and above!)

Select Fridays 5:30pm-8:30pm

Pre-registration is required:

- \$20 non-members
- \$15 for members

2011 Mission Dates:

- ✓ Oct 28th (Mars)
- ✓ Dec 16th (Comet)
- ✓ Feb 17th, 2012 (Mars)
- ✓ April 13th, 2012 (Moon)

For more information, please visit www.thediscovery.org or call (916) 808-3942 to make a reservation!

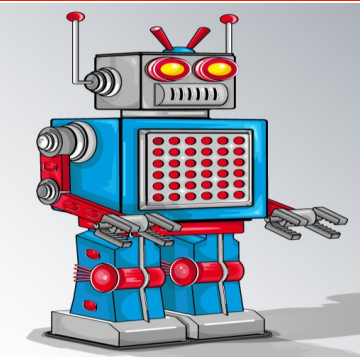


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A Discovery Museum Science & Space Center Newsletter

August 2011
Volume 3, Issue 8



Discoveries

Change is Coming

Are you ready for something new and lots of fun? The Discovery Museum Science & Space Center will be closed for two weeks (August 22 - Sept. 2) to update and augment our exhibits. Join us on Saturday, September 3rd to experience exciting new components in our Space Quest! exhibit, visit the newly-installed space cafe play area, and enjoy the re-designed Nature Discovery Room. Young future astronauts can learn about healthy diets in the Cosmic

Café imagination area. Don't miss the new "WOW!" display where everyone can test their knowledge of real meals. This new interactive play-and-learn center is made possible through the assistance of The River Cats and Sierra Sacramento Medical Society Alliance. The familiar Nature Discovery Room will undergo a transformation as well, as we "take to the trees" with an interactive installation planned for your enjoyment. Can you identify different forest

scents? What does a rainforest sound like? Little visitors can transform, too - with beautiful tropical butterfly wings to try on. All your favorite animals - Bella the Giant Flemish Rabbit, J.R. the Porcupine, Milo the Screech Owl, and the whole gang will still be here to welcome you.

Museum Members are invited to be the first visitors at the Members' Reception at 8:30am on September 3rd. The new exhibits will open to the public at 10am. See you there!



Robots & Jell-O Shots



Join us again for Robots & Jell-O Shots! The ultimate science party in Sacramento, benefiting the Powerhouse Science Center. Save the date! September 30, 2011. Live music, BBQ, raffle, rocket launches and more! Please check the website www.thediscovery.org for more information coming soon!