

Bob Ballard's Dream Comes True

After some 40 years, Dr. Robert D. Ballard's dream of simply exploring the seafloor is coming to pass. NOAA's Okeanos Explorer in the Pacific, and Ballard's vessel of exploration, the 64m E/V Nautilus in the Mediterranean, are now bringing the seafloor to the world through ROV telepresence on Internet2.

The Nautilus is the former East German research vessel R/V *Alexander von Humboldt*, which Ballard is transforming into a modern day version of Jules Verne's famous vessel. Recognising that the most momentous discoveries in the ocean were made by accident (viz. mid-ocean ridge system, black smokers, types of life not based on photosynthesis etc.), and chaffing at the fact that NASA's yearly budget for exploration of the heavens is 1600 times larger than NOAA's budget for ocean exploration, Ballard is focusing his attention on kids whose attraction to science is usually cemented by the 8th grade.

To bring the wonder of ocean exploration to the masses, the *Nautilus* uses two veteran ROVs with 4000m capability. Argus is a towed camera and side-scan-equipped sled with a wave damping tether to Hercules, which is equipped with a variety of HD video cameras, a manipulator, search sonar, and other sensors. The ROVs can generally outlast the 24/7 crews of ROV pilots, video pros, navigators, data scribes, and Internet talkers. Within seconds, what the ROVs and command center cameras see is transmitted via satellite to the Inner Space Center at URI and put on the Internet, viewable at website 1. These feeds are also viewed at five onshore Exploration Command Consoles which allow bi-directional communication (IFE at Mystic Aquarium, Inner Space Center at URI, UNH-CCOM, University of Haifa, Israel) as well as the major outreach, the Boys and Girls Club of Scottsdale, AZ, one of 4,000 such clubs, serving 4.2 million kids with 51,000 professional staff. Each cruise leg includes Teachers at Sea who give regular cruise updates to groups of interested kids.

At present, Nautilus' homeport is Yalikavak, Turkey. Approximately 6 months of the year it surveys areas in the Mediterranean and Black Seas, preferably prowling over areas mapped by multi-beam. Veteran chief scientists oversee a crew of mostly volunteer scientists as well as vacationing former participants of Ballard's past expeditions.

Last summer I had the honour of joining the E/V *Nautilus* for 32 days of exploring Eratosthenes Seamount south of Cyprus and the seafloor off Israel during legs NA008 and NA009. After 48 years of pummeling the seafloor at frequencies from below 50Hz to hundreds of kilohertz, for seismic, multi-beam and side-scan surveys, it was a mind-bending exercise to actually see the seafloor up close over hundreds of kilometers. In particular, the free-wheeling exploring was a powerful experience to the scientists aboard, whose background was primarily from proposal-mandated work at sea. As one who had published extensively on the areas visited, my job was Internet MC, fielding questions texted by viewers, periodically outlining the ever-changing programme of the day and describing what was being seen, as well as giving a stream of consciousness spiel about my profession of marine geophysics.

The experience totally altered my concept of the seafloor. While primarily featureless, it continually changes its character. And recent knowledge that each square meter probably hosts some 200 different species adds to the mystery. I heartily recommend the experience to you all.