

**Understanding the WOW: Wonders of the Ocean World
Connecting the WOW: Formal Education**

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I just returned from a research cruise with the University of Washington a few weeks ago. Every time I am at sea, I am reminded that my passion for being on a ship has never waned since my first days on board the R/V Laney Chouest with the JASON Project. I am currently a graduate student in Marine Geology at the University of Washington. I am working with my adviser, Dr. Debbie Kelley, to better understand the “Lost City” hydrothermal vents recently discovered on the Mid-Atlantic Ridge. My interest in hydrothermal vents began when I was age 12 when I stumbled into one of the very first JASON Project broadcasts in 1989. I was immediately intrigued by the foreign world of black smokers and tube worms and decided that someday I want to be an oceanographer.

Dr. Robert Ballard began the JASON Project in 1989. After discovering the R.M.S. Titanic in 1985, he received thousands of letters from students (including myself!) asking him “how can I do what you get to do?” Clearly, even a 280’ long oceanographic research vessel is not large enough to accommodate the groups of students who wanted to come, so Dr. Ballard worked with his colleagues to design the concept of “telepresence.” Live television broadcasts from an expedition site would allow students in the audience of a downlink site to “virtually participate” in the expedition. The live programs would air five times a day and feature scientists, teachers, and students conducting experiments and research on site. Scientists at the expedition site would welcome to questions asked live by participants in the audience, who would be making discoveries at the same time as the researchers in the field.

The JASON Project was named after the Greek myth of Jason and the Argonauts. Appropriately, JASON’s first expedition focused on marine geology and archaeology in the Mediterranean in 1989. The crew explored hydrothermal vents and recovered ancient Roman amphorae from the wrecks of sunken trade ships. I had a chance to see these shows at the Denver Museum of Nature and Science (DMNS) in Colorado and was immediately hooked. I was determined to find a way to somehow become more involved in this program, and maybe someday even go on an expedition as a “student Argonaut.”

In 1991 the JASON Project traveled to the Galapagos. During the months preceding the expedition, I became involved in JASON by volunteering at the Denver Museum of Nature and Science (DMNS). I worked with a group of junior high students and we collaborated with scientists, teachers, and graphic artists to construct a student-built activity center to be displayed to the public at the Museum throughout the two weeks of JASON broadcasts. We were challenged to find a visual means of teaching a diverse

audience about undersea robotics, Galapagos flora and fauna, and satellite communications. Over the course of several months, the exhibits came together into one gallery in the Museum where we proudly explained our work to the public. In between working on exhibits and attending broadcasts, I had the opportunity to attend fund-raisers where I helped Museum staff promote the idea of having the Museum sponsor the JASON Student Argonaut program, which would allow one to two Colorado high school students to go on the next JASON expedition. What better way for land-locked students to be exposed to marine science? It was an opportunity I could only hope for, and the following year, my dream came true. I qualified to be a Student Argonaut during the JASON IV expedition to Baja in the spring of 1993.

At age 16 I boarded the R/V Laney Chouest for my first research cruise. I still remember the exhilaration of feeling the pitch, yaw, and roll of the ship beneath my feet for the first time, and the challenge of trying to navigate through the confusing passage ways on the large vessel. During the daily JASON IV broadcasts, we explored the hydrothermal vents of Guaymas Basin in the Sea of Cortez near central Baja California Sur. We dissected tube worms and examined samples of the sulfide chimneys brought up by ROV and submersible from the vents 7000' below our ship. For me, it was the chance of a lifetime to be learning marine science hands on, one-on-one with some of the world's experts in the field. It was an experience I will certainly never forget and one that convinced me this is the career I want to pursue.

I remained involved in JASON the following year, by being a mentor to a group of junior high students working on the Student-Built Activity center at the DMNS for the upcoming JASON V expedition to Belize. The students agreed they wanted to construct an exhibit on coral reef bleaching, and JASON put us in touch with several scientists for the students to learn more about reefs. Teachers and Museum staff met with the students regularly to produce an eight feet tall structure we put in the Museum to teach the public about reefs. It was a terrific experience watching this group of very bright and dedicated students meet after school, agree on a topic, teach themselves, and realize that they could build a quality product that was not only scientifically correct and educational, but that was aesthetically worthy of display in a popular museum. Many of these students went on to apply to the JASON Argonaut program, and their teacher participated as a teacher Argonaut the following year. In addition to helping with the exhibits, I participated as a co-host for a follow-up broadcast after the JASON V expedition. Little did I know this wasn't going to be my last time in this position!

Throughout my undergraduate career at Stanford University, I kept in touch with my friends from JASON, but was immersed in school and mainly followed the expeditions on their new website. In school, I discovered my passion for geology. The nearby Sierras, Death Valley, and Coast range were the ideal lab for learning California's natural history – it was one of the few departments that allowed me to continue my love for hands-on learning as we pounded on rocks in the California hills and memorized mineral names and stratigraphic sequences. As much as I enjoyed walking along the San Andreas Fault, I still wanted to be conducting research underwater. Fortunately, I was able to continue my interest in marine science by participating in research programs sponsored

by the National Science Foundation. During the summer of 1997 I worked on remote sensing and marine geology at the Lamont-Doherty Earth Observatory in New York. The following summer I worked at Scripps Institute for Oceanography, piecing together the Earth's climate history using data collected from marine sediment and polar ice cores.

Since my first adventure at sea with JASON in the spring of 1993, I had seized every opportunity I could find to go to sea during college and after. I ultimately found a job on board the RVIB Nathaniel B. Palmer for a year sailing in the Antarctic as a marine science technician. The ship had become a new home, but I realized that my JASON "family" was not far away when I received an email invitation to participate in the 2002 JASON XIII expedition to Alaska. This time, however, I was no longer an exhibit-builder, student in the audience, or Argonaut – I was now stepping into the position of co-host for the live broadcasts from the Alaska Sea Life Center.

The best part about returning to a JASON expedition as an "alum" was working with this year's group of student Argonauts. Twenty students, age 13-16, came together from around the world to experience winter in Alaska, explore the Kenai Fjords, dissect seal stomachs, study ice worms, and learn about Alaska native culture. They were experiencing what I did in Baja, 1993 – a potentially life-changing experience that lifts earth and marine science out of the textbooks and into the lab. They helped with experiments that "real" scientists conduct, and had a chance to interact with experts in the fields of glaciology and marine mammology. They also had time to work with each other, a group of very talented students their own age with similar interests. Some had never seen snow before. Some had always dreamed of working with marine mammals. Some never realized that there were other students like themselves "out there." All of them were in tears when they had to leave, and unsure of how they would explain their incredible experiences in Alaska to their friends and family back home.

Many of this year's student Argonauts keep in touch with one another by email and via a chat list on the JASON Project website. To my surprise, several of them have kept in touch with me, sending me emails about their spring breaks and classes. Several have also mentioned other programs in marine science they have found to participate in this coming summer, after their JASON experience ignited their interest in the field. I was very proud to give them an idea of where they can go with such an experience that JASON provides – it certainly has allowed me to reach the stars, or rather, the ocean's greatest depths.