
My NASA Data - STEM Career Connections

Seeing Stars at Sea: The Start of a New Career in Ocean Science



Job Title

PhD student at Princeton currently working on the R/V Sally Ride for EXPORTS

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Work Description

by Abigale Wyatt / NORTHEASTERN PACIFIC OCEAN

It's been a little more than two weeks since we first set sail on the R/V *Sally Ride* for a month-long cruise to study how plankton in the ocean affect the carbon cycle and, ultimately, the climate. We left Seattle at the perfect time to get sunset photos of the city and surrounding hills. Most days, I still can't believe I'm here.

I'm one of the more junior scientists aboard. I haven't yet begun classes for a PhD program at Princeton's geoscience department, and having graduated two years ago with a degree in math (not chemistry, biology, geology, or anything ocean-related), in many ways I've felt totally overwhelmed. But having just finished eight years in the US Navy without ever deploying on a ship, I am so excited to finally be at sea that I haven't been shy about trying to jump in and learn everything.



Woods Hole Oceanographic Institution's Cafe Thorium, where 30 two-liter bottles can be filtered at a time. The rig allows scientists to process 1000 samples while at sea. Credits: Abigale Wyatt

Fortunately, the first few days were spent transiting, which meant I had little science to do and plenty of time to find my sea legs while learning methods associated with our collections at sea. Sometimes it's like learning another language: CTD, thorium, pipette, RISO, potassium permanganate, acidify, and niskin, for example. It's a combination of chemistry terms that sound familiar, technical equipment I've never heard of, and science-y-words I thought I understood but have never used in any real context. Coupled with that was the task of trying to develop a casual understanding of the logistics of a complex sampling grid that would be used to get samples for more than 40 scientists, some of whom are the biggest names in the field. Like I said, somewhat overwhelming.



Scientist Yuanheng Xion cocks niskin bottles before our test Conductivity, Temperature, and Depth



Scientists from the University of Miami, UC Santa Barbara, Sherbrooke University, and the



A salp hitched a ride to the surface during the Conductivity, Temperature, and Depth (CTD) cast.
Credits: Abigale Wyatt

So naturally, I've sought out one of my go-to means of comfort: looking up at the night sky. As a major astronomy nerd, I was incredibly excited when I realized our trip would coincide with the annual Perseid meteor shower. I envisioned lying out on the deck after a hard day of science, being lulled by the calming rhythm of the sea while staring at the deep, dark sky, watching meteors streak through my favorite constellations. It was a beautiful mental picture.

Reality was not quite what I had imagined.

One few night, I went out on deck with a scientist from Woods Hole Oceanographic Institution who is working in my group. As we headed out, I chattered on about what planets were out, how great the Milky Way would look, and which direction we should face to catch the most meteors. In hindsight, I probably should have been more concerned with practical considerations: How wet will the deck be? What's the cloud cover? What time do we have to work in the morning?

Turns out, boats are wet. Wet and cold. And since we were still moving toward our station, water was sloshing and spraying, with the boat rocking as we steamed ahead. I felt silly for imagining I would lie out and relax on the deck all night. Instead, we stood, necks craning, waves crashing, looking at as much sky as we could see through the clouds. Apparently, the Gulf of Alaska is a pretty cloudy place this time of year, so we were lucky to have even 50 percent visibility. Scorpio was missing its legs and Cassiopeia was totally hidden, but at least Jupiter was big and bright. I pointed out the Northern Cross when we saw it!

(CTD) cast on a rare cloudless day in the Gulf of Alaska. Credits: Abigale Wyatt

University of North Dakota collect water samples on a typical gray morning. Credits: Abigale Wyatt

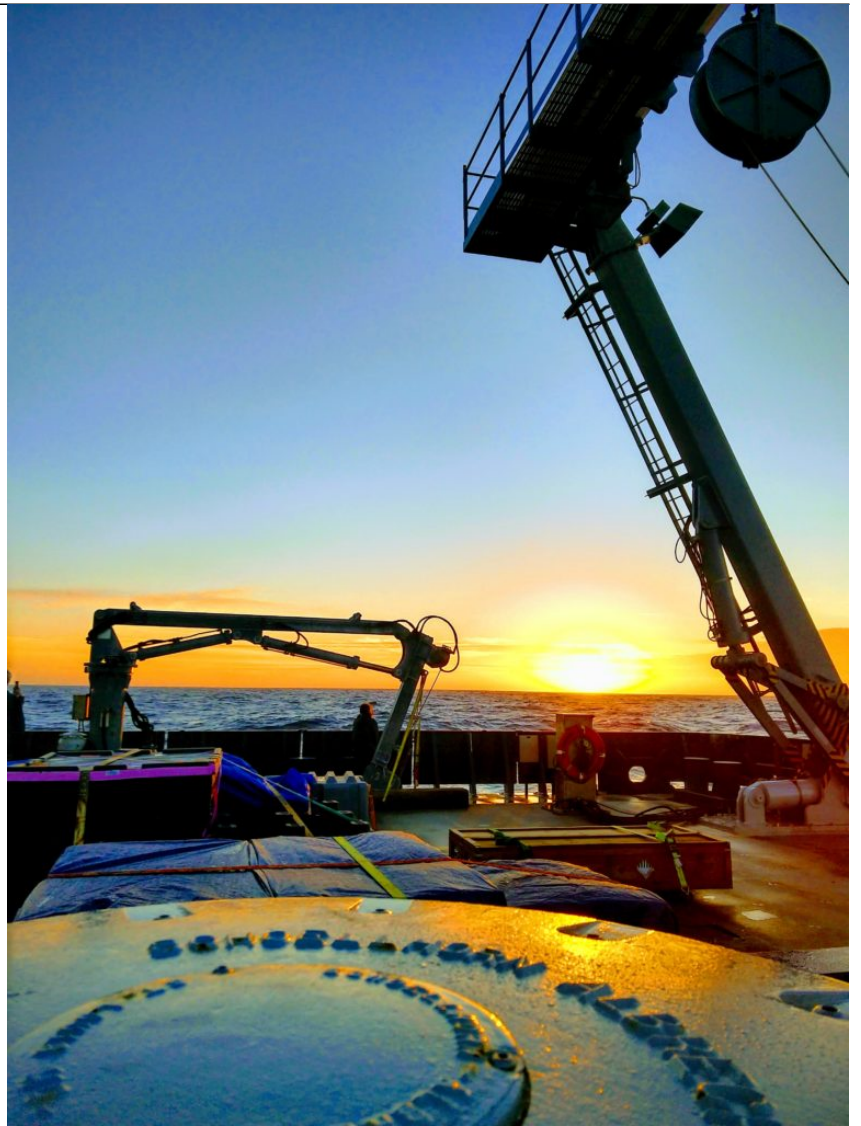


Scientists flock to the deck to enjoy the sunset on a clear evening after days without seeing the Sun.



The Sun sets over the R/V Sally Ride as she carries a fleet of scientists on the EXPORTS cruise in

Credits: Abigale Wyatt

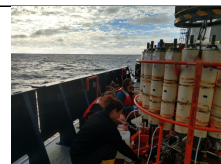


Sunset bathes the aft deck in orange light, highlighting the boxes of scientific equipment marked with pink duct tape to signify their home on the R/V Sally Ride. Credits: Abigale Wyatt

Our first meteor was super bright, probably one of the brightest I've ever seen. It was so fast we both gasped and pointed, then laughed at how excited we were. We saw more, including one with a tail so long it covered a quarter of the sky. While I've stargazed a lot since I was a kid, this was such a new experience. Seeing from horizon to horizon made it so much more apparent that we were sitting on top of a single round planet in the middle of this massive universe, tucked away in our quiet galaxy among stars and planets lightyears away.

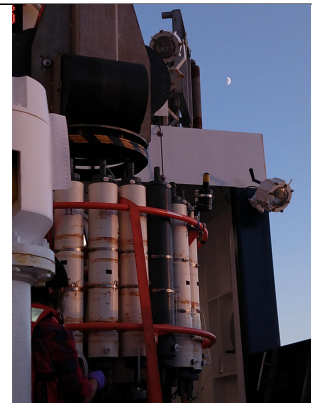


Even as the R/V Sally Ride steams ahead to the next station, scientists are on deck collecting water



Dr. Claudia Benitez-Nelson (University of South Carolina), my mentor on ship, sampling water at the

from the last Conductivity, Temperature, and Depth (CTD) cast. Credits: Abigale Wyat



The Moon rising over the Conductivity, Temperature, and Depth (CTD) instrument on the R/V Sally Ride as we sample water in the gulf of Alaska. Credits: Abigale Wyatt

Since then, clouds have obscured the night skies too much to try again, but the ship is quickly becoming a second home. Several times a day we send out a Conductivity, Temperature, and Depth (CTD) instrument, which is a water-analyzing device equipped with niskin bottles that fill up at depth. In the lab we do some chemistry, including acidifying our samples by decreasing their pH, followed by adding potassium permanganate to allow the water to release particulates. Finally, we count the thorium radiation from our filtered samples using a RISO machine, all so we can tell how carbon is cycled by the ocean. It's been a lot to learn and, still, everyday there's more.



From the left, chief scientist Norm Nelson (UCSB), Montserrat Roca Marti (WHOI), Abigale Wyatt (Princeton), and Samantha Clevenger (WHOI). The most novice and most senior scientists enjoying

the evening breeze on deck. Credits: Abigale Wyatt

The moments I feel overwhelmed, I just remind myself I'm lucky to be part of this huge project. Our research will help us better understand our oceans, our climate, and our planet. And while I may be a novice in ocean science, being at the very beginning of my graduate studies, this has certainly been a most stellar way to start!