

PATTY PRATT | Systems Engineer and Calibration and Validation Lead for Ocean Color, Northrop Grumman Aerospace Systems (patty.pratt@ngc.com)

Degree: When, where, what, and what in?

In 1987, I earned a bachelor’s degree in fine art–sculpture at University of South Florida, Tampa. In 1991, I was contemplating how to have a career with my art degree and sought a teaching credential. I had always loved science in high school and chose to add on a science teaching credential. This notion changed the course of my life. I took an astronomy class at University California, Santa Cruz, and fell passionately in love with the study of light and spectral analysis. I had to know how and why things absorbed, reflected, and/or emitted light. I knew I would need a physics foundation, so began taking math courses required for admission to the physics department in the University of South Florida. I actually paid out-of-state tuition to take Calculus 1. My family thought I was crazy.

In 1993, I entered the undergraduate physics program. A professor, Kendall Carder, heard about a student in the physics department who loved spectral analysis. He enticed me to come into the graduate marine science program as soon as the prerequisite physics courses were met—adding that research cruises were a must. My arm was forever twisted, and I began a journey into ocean optics that I could have never imagined. In 1997, I earned a Master’s degree in marine science/ocean optics at University of South Florida, St. Petersburg.

Did you stay in academia at all, and if so, for how long?

I worked as a research assistant on a NASA Fellowship at the University of Central Florida in Orlando in the graduate physics department for 2.5 years, using laser light,



electricity, and magnetism to investigate suspended magnetic fluid for projects on the International Space Station.

How did you go about searching for a job outside of the university setting?

I primarily used the Internet, looking at websites of specific companies located in Florida that had anything to do with the ocean, and I networked with peers and colleagues to get more ideas and leads. Ultimately, I did a nationwide search before securing a good entry-level position (Ocean Analyst) at Orbimage, which later became GeoEye (now owned by DigiGlobe). Because of my diverse background, I did not need to emphasize my level of skill in theoretical optics.

Is this the only job (post-academia) that you’ve had? If not, what else did you do?

I worked at Orbimage/GeoEye, a satellite data vendor for 1.5 years doing ocean color work for the fisheries industry. I actively sought opportunities and activities within the company to expand my skills and to utilize my theoretical optics capabilities. I actually took on tasks of one of the optical engineers after work hours (no pay) simply to learn the skill. I continued to

network with people I knew and met along the way, and I learned new tools such as mathematical software codes and Linux and Windows systems on my own time to remain current in the marketplace, while searching for a more formal career that would capitalize on my increasing experience in engineering.

What is your current job? What path did you take to get there?

I invested a lot of time applying for new positions while employed by Orbimage/GeoEye and interviewed even if the job wasn’t perfect. I researched the various systems that were being built and learned all the acronyms and program specific news via public venues, especially sound-recorded, archived conference plenary sessions. I listened to the speakers from past conferences over and over again to learn the material and be well versed in their topics. I knew them by voice long before I ever met them face to face. I knew nearly every sensor and system being built so that no matter which program I had the opportunity to interview with, I could already speak the program specific “language.” Ultimately, one of the people I interviewed with at Northrop Grumman called back when an appropriate position was posted. I am now a systems engineer and the calibration and validation lead for ocean color at Northrop Grumman Aerospace Systems on the Suomi National Polar-orbiting Partnership (NPP, formerly NPOESS).

My work focuses on our nation’s climate and weather satellites, specifically in the area of ocean color. I’ll never forget the first major program meeting at Northrop Grumman with the customers and scientists all in the same room presenting when I would hear a voice and say to my

self, “Ahh, that’s so and so.” And I would remember exactly who they were and what they did. I was able to speak to many people right away about their specialties and ask pertinent questions.

Currently, I create software tools to analyze the active system on one of the instruments aboard Suomi NPP and compare it to the sensor level test data that I analyzed while the instrument was still in the test chambers. I am involved with testing and ultimately integrating a new calibration technique that may nudge the state of the science one step further. In the first few years of working at Northrop Grumman, I followed and analyzed many tests done by the subcontractor, though the ones that are the most pertinent to ocean color, such as polarization, were my accountability as Calibration/Validation Systems Engineer Ocean Color Lead.

What did your oceanographic education (or academic career) give you that is useful in your current job?

Training in a combination of physics and theoretical optics, in conjunction with marine science and ocean optics, provided me with a unique set of skills that correlate to my current position working with both satellite sensor payloads and the ocean color community at large. Having participated on lengthy research cruises at sea with many colleagues, I am able to effectively convey the needs of fellow scientists to the sensor and satellite developer community. I understand the way the light enters the telescope and falls on the detector substrate, and I approach ocean color from the standpoint that if the sensor or detectors are not calibrated and validated, the data from the water leaving radiance (ocean color) never will be. I consider myself to be a liaison between the sensor and the ocean color scientist. Because I have the experience at sea, I can more easily guide the sensor testing and

troubleshooting process to deliver a system that optimizes the products delivered to the ocean scientist.

Is the job satisfying? What aspects of the job do you like best/least?

Northrop Grumman Aerospace Systems offers a considerable amount of latitude to creatively solve problems in a wide variety of tasks, from sensor testing to “big data” reduction. It is quite gratifying to be able to invent something useful in the business world. On the other hand, the freedom to take deep dives into the more academic side of ocean science problems isn’t in my job jar. However, the creation of new tools to investigate how sensor test data can influence ocean remote sensing is a deep dive that few can experience. It requires understanding both ocean color (light coming from the sea surface) and how it is interpreted by the sensor and algorithm (integrated system) in order to correctly design and calibrate a method that works.

Do you have any recommendations for new grads looking for jobs?

While seeking a job, and even after you find one, continue to focus on what truly lights you up and keeps you engaged in your own development. Be willing to work on your own for free to stay current with market needs, and always seek ways to build relationships with key scientists in the exact, and similar, fields that interest you. Allow your pursuit to evolve around a need rather than constraining it to a specific focus. Grow with the unfolding science.