



US-ELTP Career Profile

Melissa Trubey

Thirty Meter Telescope Senior Instrumentation Opto-Mechanical Engineer



It is not just what you can do or what you are knowledgeable about; it's also the relationships you build and who you are as a person that determine success in life."

The saying "life is like a roller coaster" illustrates 's life, with a few twists and turns, along with her literal roller-coaster design experience. Melissa has always persevered to get to where she is today, seeing every opportunity and challenge as a learning experience. With a multitude of interests, she has moved through a variety of engineering positions, from past roles in snowboard design and manufacturing to the design and retrofitting of roller coasters, to the design and build of satellite, airborne, and terrestrial optical and laser systems. Through different companies and industries, she learned the importance of adaptability, diligence, creativity, continual learning, as well as good leadership and teamwork in the work environment.

Melissa is the Senior Instrumentation Opto-Mechanical Engineer for the Thirty Meter Telescope. A member of the Adaptive Optics (AO) team, Melissa's role is multifaceted

and primarily involves the optical and mechanical design of several first-light instruments and subsystems. She also oversees partner institutions and supplier contracts, including key components of the Thirty Meter Telescope's Adaptive Optics system, which enables the telescope to have resolution 12 times better than the *Hubble Space Telescope* from the ground.

What do you enjoy about your career?

Besides enjoying the design, aesthetics, and building process, working to create a next-generation science project like Thirty Meter Telescope is the type of opportunity that comes along so rarely. I am both grateful and excited to be part of something that is hopefully going to inspire humanity and leave a legacy that improves our knowledge of the Universe.

How did you become interested in engineering?

With both of my parents from technical backgrounds, one an engineer and the other a mathematician, I was exposed to science and engineering from a young age, though I often did not realize it. I grew up with Legos®, Erector sets, various models, and science and craft kits, and as a kid, I enjoyed looking through telescopes. I have memories as a six-year-old helping to rebuild an old F-150 truck from the ground up with my dad, and many other building projects of all sorts. Experiences

Fun Facts:



Skiing and snowboarding have been a big part of my life, and I have even instructed these sports at a major resort in California.



I sailed competitively during college. I also taught a variety of water sports and youth camps at my university's aquatic center.



I still enjoy designing, building, and repairing many things, from home projects to vehicles and more.

like this taught me that the best way to learn was by doing, and they changed my perspective on how I viewed everyday objects. You don't typically think about all the little things that go into a final product, such as a car or even a giant telescope, which may seem very complex on the surface. However, when you start taking these products apart, they are actually composed of little understandable pieces, each with its own specific role, and together they create something significant.

I originally went to college unsure of my direction and intended career. I changed majors several times before landing in mechanical engineering. Once I found engineering, everything aligned and clicked with the way my brain worked. After college, I first worked for a large aerospace company where I was very fortunate to work on multiple fast-build experimental programs, including personally designing, building, and testing hardware that went into space. In this role, I learned most of my optics and laser background, as well as a multitude of best practices, from great mentors.

What were some challenges or opportunities you faced along the way?

Throughout my career, I had many opportunities that resulted in my personal and professional development. The opportunities I had in association with high-technology projects have been the most fascinating for me, especially in regard to optics and physics. Engineering is the real-world application of science and math, achieved through challenging problem-solving, and creating something new is often very exciting and fulfilling. Some of these projects exposed some weaknesses in my engineering background, which led me to pursue additional knowledge through self-study, collegiate and professional courses, industry conferences, and company mentorships. My engineering development has not always been a direct and linear path, as there were a few excursions along the way. However, these excursions have provided me with a great deal of insight into other industries, styles of engineering and management, team structures, and various methodologies, all of which have both greatly enhanced my professional development and allowed me a unique perspective and contribution.

Melissa's Pathway to TMT's Senior Instrumentation Opto-Mechanical Engineer

