

Engineering Job: Postdoctoral Researcher Scientist in a Nanoscience Research Laboratory

What engineering field, discipline, or category most aligns with your job?

Material Scientist (mix of engineering, physics, chemistry) Physicist, research scientist, nanotechnology researcher...

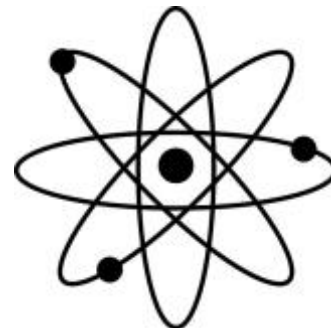
I try to find new materials to make the use of light possible in everyday applications such as: energy (solar energy), computers (on-chip optical processing like fiber optics but miniaturized for a computer chip), quantum computers (trying to develop devices to make a qubit), [or] detecting tiny objects with better resolution using light (optical sensing & microscopy).

What kinds of things do you do in your position?

- 1. I build microscopes to analyze the optical properties of new materials developed by scientists. The different microscopes allow me to observe how new materials interact with different types of light polarizations, intensities, and wavelengths.*
- 2. After designing & building the microscopes, I program different optical sensors/detectors to measure the optical signals and save them to a computer.*
- 3. Lastly, I have to model the electromagnetic response of my materials to verify that my experimental measurements can be predicted by a reliable simulation model.*

What has been one of your favorite projects?

I enjoyed doing a non-linear experiment which used a high intensity laser to perform photon math inside a material. So, two photons could combine together inside the material to create a third photon whose energy was the sum of the first 2 photons. Challenges were learning to deal with an ultra-fast laser (tiny light bursts but higher energy) as opposed to conventional continuous wave lasers. It was super cool to deal with a project that could only be explained using quantum mechanics (second harmonic generation).



What inspired your interest in this kind of work?

I always liked my math classes in secondary school and people advised me that I should be an engineer. When I got to college, I really enjoyed my Physics classes but wanted to do something I thought was more "practical" or at least application-based so I majored in Electrical Engineering. At the time, Electrical Engineering was a mix of computer engineering, computer science (software), and building hardware to measurement physical stimuli (physics) all of which intrigued me and gave me several career options after graduation. I chose to get my Master's and Doctorate degree in Applied Physics and Electrical Engineering, and now I do research.