PhD Program in Optics

Delaware State University is one of only about a dozen institutions nationwide to offer a Ph.D. in Optics — and it is the only HBCU to do so. Our doctoral candidates enjoy extraordinary research opportunities at the Center for Research and Education in Optical Sciences and Applications (CREOSA), an NSF-funded lab housed on campus. Ph.D. candidates collaborate with world-class researchers at CREOSA on groundbreaking work in such areas as

- laser spectroscopy
- biophotonics
- experimental quantum optics
- optical interferometry
- nanophotonics
- data mining (in collaboration with the Department of Information Sciences)

In this unusually robust research environment, doctoral students can produce high-caliber original research that leads to publications, funding opportunities, industry partnerships, patents, and academic recognition.

Professional Preparation

Ph.D. candidates at Delaware State University engage in a full range of activities to prepare them for careers in academia, industry, and/or the nonprofit sector. These include

- conducting independent research
- working with state-of-the-art technology and instrumentation
- developing professional academic networks via conferences, publications, and research partnerships
- establishing industry contacts
- submitting papers for publication
- applying for grants and other sources of funding

Faculty

Faculty at Delaware State University are superior researchers and highly committed educators. Our professors spend many hours in direct, one-on-one interactions with students. They also are accomplished investigators engaged in high-level inquiries for major funders such as NASA, the Department of Defense, the National Science Foundation, and NIH.

Research and Experience

Established in 2006 through a National Science Foundation CREST grant, CREOSA conducts high-level research with applications in areas such as medicine, homeland security, telecommunications, the environment, and computer science. Current research projects underway at the Center include

- Laser-induced Breakdown Spectroscopy
- Photothermal Lens Spectroscopy
- Optical Solitons (in collaboration with the Department of Mathematical Sciences)
- Single-Molecule Spectroscopy
- Electromagnetically Induced Transparency, and Slow & Fast Light
- Optical coherence tomography
- Data Mining of Spectroscopy Data
- Nanophotonics
- Biomedical Electronics

The Ph.D. in Optics Program will have a deep focus in the areas of laser spectroscopy, biophotonics and nanophotonics, and develop many challenging and exploratory projects based on optical nanotechnology and its applications to aid the health related sciences.

Students in the Ph.D. program will be required to complete a dissertation and an oral defense of it. The Ph.D. Program in Optics has a typical duration of four to seven years for full-time students. The program will be the first of its kind in the State of Delaware and the region and amongst about a dozen institutions in the nation that offer a Ph.D. in optics. Furthermore, it is designed to be linked with other related research and academic programs in the region, as well as the biotechnology and pharmaceutical companies in and around Delaware. The foundations for the Ph.D. Program in Optics — which was established in 2008 — were laid by the DSU Center for Research and Education in Optical Sciences and Applications (CREOSA). Given the interdisciplinary opportunities that optics presents, students in the Ph.D. Program in Optics will have the same opportunities. Interested students, researchers and engineers can obtain more information by contacting the DSU Department of Physics at 302.857.6659

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