The Northeastern University Young Scholars Program

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Overview

The Young Scholars Program at Northeastern University began in 1989 in response to a national shortage of qualified U.S. citizens moving into STEM careers. Resurrected in 2004 through support from The Noyce Foundation, the NU Young Scholars Program (NUYSP) coordinated by the Center for STEM Education at NU, addresses a critical recommendation made in the recent national report, “Rising Above The Gathering Storm”, by providing expanded experiential learning experiences in STEM for K-12 students. NUYSP offers future scientists and engineers a unique opportunity for hands-on experience while still in high school. The 2008 program was supported by EMC, Textron, and Gordon CenSSIS.

Northeastern University Young Scholars Program – Research Experience that Matters!!!!

Northeastern’s dedication to encouraging industry-relevant experiences along with classroom education is the major thrust of the program. The University’s outstanding facilities and staff, coupled with Northeastern’s hands-on approach, provide a challenging opportunity. The following research assignment documents the progression of a Biomedical Imaging lab as students work for five years developing test targets (tissue phantoms) and measuring their optical and acoustic properties.

Research Assignment 2004-2008: Biomedical Imaging
Principal Investigator: Charles DiMarzio
Optical Science Laboratory, Gordon CenSSIS

2004 - Design of Test Targets for Biomedical Imaging
Students develop the targets, testing many different formulas. Once a target has been created, the team measured the optical and acoustic properties to see if it is a close match to human tissue.

2005 – Tissue Phantoms for Biomedical Imaging I
The students continued work on the development and testing of realistic tissue phantoms to simulate human tissue in optical and acoustic imaging experiments. They fabricated phantoms in different shapes, and measured the optical and acoustic properties. Students began work on designing and building a double integrating sphere to measure the optical properties of the test targets.

2006 – Tissue Phantoms for Biomedical Imaging II
Three more students continue the work from last year’s program, as they continue to develop a functioning double integrating sphere to test the tissue phantoms.

2007 – Tissue Phantoms for Biomedical Imaging III
2007 Young Scholars learn/hone some electrical engineering skills as they work on the circuitry for the double integrating sphere.

2008 – Understanding the Optical Properties of Tissue using Dual-Integrating Sphere Theory
2008 Young Scholars continued the work done up to this point and began making major headway. Over the summer students gained a better knowledge of how light interacts with tissues, redesigned the circuit and collected better data, ran tests on sample tissue phantoms, and automated the system. Because of their hard work, the findings are better than earlier ones and enough to reinforce dual-integrating sphere theory.