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NEWSLETTER

December
2019
January
2020

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North Carolina Section of the American Association of Physics Teachers

The Fall NCS-AAPT meeting was held in Durham, NC, on November 15th and 16th. The applied physics major students, **Evert Garcia-Guzman**, **Tristan Dryer**, and **James Graham** attended and presented a poster at the meeting.

Identifying, characterization, and mitigating problematic lasers for photodetection with a single lock-in amplifier

Evert Garcia-Guzman – UNC-Pembroke

In the course of an investigation to measure the dispersion of the Verdet constant for BK7 glass using an ac magnetic field and a lock-in amplifier, several different types of lasers posed difficulties in obtaining reasonable and/or reproducible results. Herein, we provide a general prescription to mitigate the undesirable effects from four different types of variations in laser power when employing CW lasers in conjunction with a trans-impedance amplified photodetector and a digital dual phase lock-in amplifier. However, the mitigation schemes outlined here could offer insight to minimize similar detrimental signal variations arising in other phase sensitive detection (PSD) experiments. **Sponsored by William Brandon.*

Reference Data for the Verdet Constant of BK7

Tristan Dwyer – UNC-Pembroke

The Verdet constant of BK7 glass was experimentally determined in the visible to near infrared wavelength range corresponding to 400 – 1000 nm. In addition to our data, obtained utilizing phase sensitive detection and an ac magnetic field, we have also analyzed and compared all other known data for BK7. This exhaustive data mining work is intended to provide researchers and physics lab instructors interested in developing apparatus to measure Faraday rotation an accurate reference table for BK7 glass. **Sponsored by William Brandon.*

Exploring an Educational Speed of Light Apparatus

James Graham – UNC-Pembroke

Industrial Fiber Optics' Speed of Light Apparatus affords a simple experimental method for determining the speed of light in fiber optic cables. However, utilizing oscilloscope cursors to measure the pulse delay time, as described in the user manual, relies heavily on a "best guess" of peak positions. Furthermore, time jitter associated with digital oscilloscopes increases the uncertainty of peak positions when compared to analog oscilloscopes. This investigation describes an experimental method giving the least uncertainty, with no ambiguity. The best results are obtained through a proper analysis of the pulse data dumped into a spreadsheet utilizing a digital storage oscilloscope.

NC Space Grant

Tiffany Bramblett was one of two students in the state of NC chosen for a scholarship:

Tiffany Bramblett, Lumberton, North Carolina

Bramblett is a sophomore at the University of North Carolina at Pembroke (UNC Pembroke). She is interested in chemistry and physics, and is currently majoring in chemistry. As a Structured Learning Assistance (SLA) Leader in the biology department at UNC Pembroke, Bramblett helps lower-level bio students improve their grades and helps them manage a potentially overwhelming college workload. She enjoys working with small numbers and precision in her lab experiments. This award will expose her to different aspects of science that NASA utilizes for space flight. Bramblett's faculty advisor, physics professor William Brandon, commends her academic dedication, exemplary work ethic and encouraging leadership style.

For more information: <https://ncspacegrant.ncsu.edu/2019/11/12/new-stem-bridge-scholars/>

Congratulations to all of the students and Dr. Bill Brandon. What an honor to the department and the University.

SNCURCS -2019 Conference

Our student, Riko Ramos, presented an oral presentation at the SNCURCS -2019 conference, held at the Duke University on November 23. He did a good job and presented UNCP really well. We are proud of you, Riko.



HOUSEKEEPING

The department would like to thank, Billie Jones, for keeping the third floor clean. Thank you, Billie. Good job.



Chemistry and Physics Graduates

The 2019 Commencement was held December 7 for the undergraduate students. Congratulations to all graduates.

College of Arts and Sciences



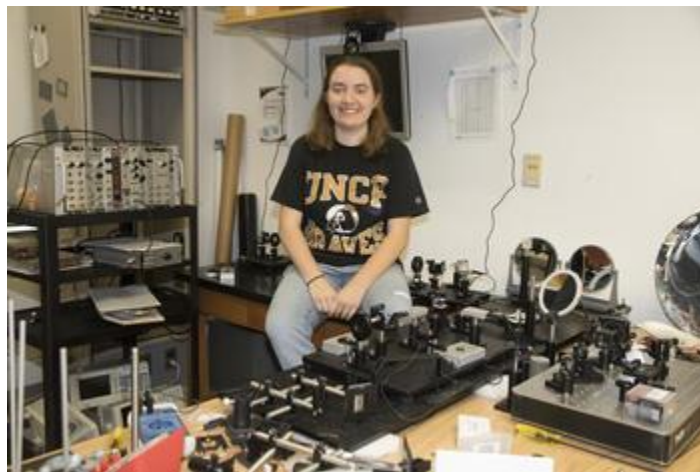
Chemistry and Physics Department Meeting

The spring semester 2020 department meeting was held January 9th in room 3256. Chancellor Robin Cummings visited the department and spoke to the group directly on upcoming projects and ideas for the university and to answer any questions. He thanked everyone for everything we do to help our students. Dr. Jeff Frederick spoke to the group as well. The department classes are filled with high numbers of students. The general education courses stands within the average range. After the meeting, pizza was served for lunch by Sodexo. Everyone had a great time socializing.





Students News



Sandra Huneycutt's work at UNCC. The group's paper title of research project is:
A Cost-Effective Alternative to Dispensing Ag Ink for Highly Efficient Si Solar Cell Contacts

Authors: Luke Caplice, Sandra Huneycutt, Shagufta Raja, Abasifreke Ebong

Published IEEE Xplore

Date: 10/06/2019

Lauren Marshall Cooper. She is a pharmacist in the Mt. Airy area. She was recently featured on the cover of a magazine for building a miniature pharmacy full. She has been very successful since graduating.

Amy Avirett Mitchell. She is a pharmacist for St. Jude Children's hospital in Tennessee.

Rhonda McClure McFelder. She now has finished both the MD and PhD degrees.

Dr. Jose D'Arruda named American Association of Physics Teachers Fellow



Professor Jose D'Arruda has been named an American Association of Physics Teachers (AAPT) for making exceptional contributions to enhancing the understanding and appreciation of physics through teaching.

AAPT is an international organization for physics educators, physicists, and industrial scientists—with members worldwide. D'Arruda has been a member since 1975. Among the longest-serving professors at UNCP, he has taught in the Chemistry and Physics Department for 45 years.

He served for 23 years as department chair. He established a degree program in applied physics, founded the Region IV Science Fair and instrumental in the creation of the 3-plus-2 engineering program with N.C. State University. He also serves as director of the UNCP astronomical observatory and advisor for UNCP's high-powered rocket competition team. In 2018, he was presented with the Homer L. Dodge Citation for Distinguished Service to AAPT.

Congratulations