



OPEN Optics and Photonics Education News

Newsletter of the Optics and Photonics College Network

November 2017

From the Executive Director



The first item in this newsletter describes another national study that validates the benefits of associate degrees for technicians, as compared to many bachelor degrees.

Several other briefings in this issue highlight interesting, useful events and internship opportunities for students, as well as new student outreach strategies. Please send

information to OP-TEC about noteworthy efforts that you have facilitated for your college. As we commemorate Veterans Day during November, please remember to provide student recruitment outreach to our returning veterans. An excellent source of highly qualified students!

I recommend that you consider using OP-TEC's lab videos to introduce and enrich the labs for your students. Links to these free videos are provided in the last article, below.

Dan Hull

Fixation on Bachelor's Degrees

Technicians with Associate Degrees Earn Greater Salaries than Completers of Bachelor Degrees in Traditional Majors

An October post by Catherine Gewertz in Education Week's *High School and Beyond* blog references a recent study concluding that American educators and policymakers must "move beyond our current fixation on the bachelor's degree," and embrace the promise of associate and certificate programs, noting that many jobs with good pay don't require bachelor's degrees.



Degrees of Opportunity: Lessons Learned from State-Level Data on Postsecondary Earnings Outcomes, the report by the American Enterprise Institute, shows that majors matter a great deal to postcollege earnings, no matter the degree level, and that skills-

oriented programs in technical fields are usually more remunerative than programs in traditional academic fields.

The conclusion of this recent study is not surprising to the photonics industry, as well as administrators and faculty at two-year colleges. The study report, by a highly respected national organization, may be useful information for parents of high school students, and adults, who are considering higher education options, career possibilities and college expenses.

Harnessing Thermal Radiation

In This Issue

[From the Executive Director](#)

[Fixation on Bachelor's Degrees](#)

[Harnessing Thermal Radiation](#)

[Harris Technology Center Visit](#)

[SACNAS Conference](#)

[8th Grade Career Days](#)

[Crosstrain Your Colleagues](#)

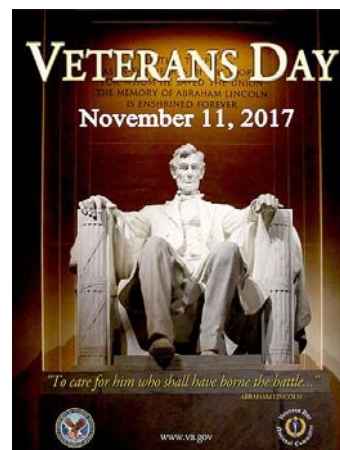
[Upcoming Events](#)

[Beam Quality Webcast](#)

[NIST Internship Opportunity](#)

[PACT Alumni Spotlight](#)

[OPCN Working Groups](#)



Upcoming Events

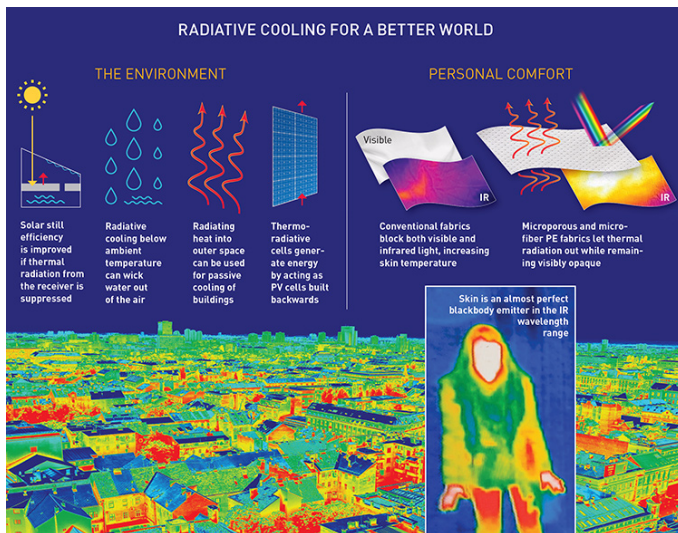
12/06/17 - 12/09/17
**ACTE CareerTech
VISION 2017**
Nashville, TN

01/27/18 - 02/01/18
SPIE Photonics West
San Francisco, CA

03/12/18 - 03/15/18
Innovations Conference 2018
San Francisco, CA

04/28/18 - 05/01/18

Optics and Photonics News published an interesting article this month describing how thermal radiation can be used for different applications including lighting, energy generation, and non-contact cooling.



[November 2017 OPN, Alessia Kirkland / IR Background: Getty Images]

This article examines how all items exchange energy with their environment with some of that energy carried by photons as thermal radiation. A new paradigm is emerging that this thermal radiation can be very coherent, exceeding Planck's law limits. This coherence implies the design of regular optical components, for example, interference filters, gratings and resonators, can be utilized to control radiative heat similarly to the way they are utilized to control visible light.

The article goes on to discuss how learning to efficiently control and use thermal radiation has great potential to improve and maintain our quality of life. Applications described include:

- "Recycling" incandescent light bulb infrared photons that do not contribute to visible illumination, eliminating much of the waste heat as it is re-absorbed by a bulb's hot filament.
- Using terrestrial hot objects as a source of photons that can be converted to electricity by PV cells.
- Using the cold of outer space as a heat sink, since the atmosphere is highly transparent for photons in the 8-to-13-micron frequency range.
- Purifying water using solar stills that trap solar-generated heat so efficiently they enable water to boil under direct sunlight.
- Developing new materials and fabrics that better allow heat to radiate out through our clothing rather than being trapped inside.

To read the complete article and obtain more information see Heat is the New Light.

IRSC Students Visit Harris Technology Center

Indian River State College Robotics and Photonics students visit Harris Corporation Photonics Core Technology Center in Palm Bay, Florida

A group of 36 students, faculty, and staff of the Indian River State College (IRSC) Robotics and Photonics Institute visited the Harris Technology Center in Palm Bay Florida on Friday, October 13th, 2017. The students learned about the Space and Intelligence

American Association of
Community Colleges (AACC)
Annual Convention
Dallas, TX

[View Events Webpage](#)

Beam Quality for High-Power Lasers Webcast

LIVE Webcast: November 14,
2017 at 12:00 PM CDT
by Laser Focus World

Rudiger Paschotta will present a Webcast on the principles, details, and best practices for various types of high-power lasers beam measurement.

Webcast to cover:

- Summary of beam characteristics
- Measurement techniques
- Relevance to high-power laser applications
- Beam-measurement best practices

[Register Today!](#)

Webcast will be archived and available on-demand within 24 hours after the live event.

Internship Opportunity

The poster is titled "NIST INTERNSHIP OPPORTUNITY" and features logos for NIST, SUNY, and NEATEC. It describes a full-semester internship in semiconductor and nanotechnology manufacturing processes. The poster includes a list of qualifications, a list of responsibilities, and a list of benefits. It also includes a table with the following information:

Category	Requirement	Requirement
Education	Bachelor's degree in Engineering, Physics, or Materials Science	Minimum GPA of 3.0
Experience	Relevant work or research experience	Minimum 1 year
Skills	Strong analytical and problem-solving skills	Excellent communication skills

The poster also includes a section for "APPLICATION" with a deadline of November 15, 2017, and a contact email for Dr. Rudiger Paschotta.

In collaboration with NEATEC, NIST offers a full semester internship in semiconductor and nanotechnology manufacturing processes.

This is an opportunity for college students or recent college graduates to learn

Systems Segment of the company, investigated internships and future employment in this high-technology field.



The group had a rare opportunity to tour the Photonics Core Technology Center laboratories with Catheryn Logan, Senior Photonics Engineering Manager, and Dr. Richard DeSalvo, the Senior Scientist of Harris Corporation. Dr. DeSalvo's team leads the Research and Innovation Projects and Development Programs in coherent RF photonics, optical-wireless, and lightwave communication systems beyond 100 GHz. Bill Summers, the Engineering Manager of the Microelectronics Core Technology Center, gave a comprehensive overview of the operations and achievements of the Center.

"A two-year AS degree in electronics engineering technology with the IRSC prepares students for careers in electronics and photonics making our graduates strong candidates for employment at Harris", says Dr. Chrys Panayiotou, Department Chair of Electronics Engineering Technology Department and Principal Investigator of LASER-TEC. "We are extremely happy to continue our long-term partnership with Harris".

Harris is an international communications and information technology company serving government and commercial markets in more than 125 countries. Headquartered in Melbourne, Florida, the company has approximately \$5 billion of annual revenue and about 14,000 employees, including 6,000 engineers and scientists. Harris is dedicated to developing best-in-class assured communications products, systems and services.



Western Cluster Instructors Attend Conference About Supporting Underrepresented Students

Dr. Desire Whitmore, from Irvine Valley College, and Stephanie Bostwick, from Lake Washington Technical Institute, attended the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) conference in Salt Lake City, Utah.



Desire and Stephanie in the Conference Center

The conference aims to promote underrepresented students in STEM, and to encourage them to study these fields. Desire and Stephanie represented Career Technical Education, mentored young scientists from across the country, and found internship

about semiconductor and nanotechnology manufacturing processes by working on the NIST campus at the Center for Nanoscale Science and Technology. The students will be personally mentored by scientists and engineers at the CNST.

Apply by clicking [here](#).

PACT Alumni Spotlight



Michael Bass attributes much of his success to his mentor, Gary Beasley, head instructor for lasers and photonics technology center at Central Carolina Community College (CCCC).

After high school Michael began a program in electronics engineering technology at CCCC. Gary saw Michael's potential and spent two years recruiting Michael to the photonics program following his electronics curriculum. Michael recalls. "If it wasn't for Gary's passion and dedication to the student, then I would not be where I am today."

Michael inherited his mentor's passion. He says, "Photonics is such a young industry. Most photonics jobs are on the cutting edge of technology. That's one of the things I find most interesting, working with technology and taking it from the research-and-development stage to a practical-application stage, whether it is manufacturing, medical, or telecommunications. The applications of photonics are almost endless, which means the opportunities that can be opened for you are very broad."

At CCCC, Michael says, he learned about "having a foundation of technical

and employment opportunities throughout the country for their students.

8th Grade Career Days at IHCC

Indian Hills Community College hosted 8th Grade Career Days on Friday, October 13th and Friday, November 3rd. Over 1500 students from 21 regional school districts attended the events. Students were able to learn about career opportunities and experience laboratory activities in over 40 career areas. Each student chose three career areas to visit while on campus.



Students observe a laser welding demonstration.

The IHCC Laser & Optics Technology Program featured a laser light show along with variety of hands-on activities and demonstrations. Students used lasers and optical components to align lasers, find focal points, and other activities. Students observed a stainless steel laser welding demonstration with a TRUMPF TruLaser Station 5005

and a laser engraving and laser cutting demonstration using an Epilog HELIX laser.

Second-year laser program students guided the hands-on activities and provided the equipment demonstrations. For many of the 8th grade students, it was the first time they had ever set foot on a college campus and been exposed to most of the career areas. Over 130 students visited the Laser & Optics Technology laboratory between the two events.



Crosstrain Your Colleagues with OP-TEC's Online Faculty Development Courses

Is your photonics program expanding? Do you need an additional faculty person, a co-instructor, or do you just wish there was someone on campus who help you with laboratories or who could fill in for you while you are on leave?

OP-TEC highly encourages all colleges with photonics programs to maintain at least two highly trained and experienced photonics instructors. OP-TEC's online professional development courses are an excellent way to prepare faculty, adjuncts, and laboratory staff to teach with the Fundamentals of Light and Lasers (Course 1) and Laser Systems and Applications (Course 2) textbooks. The courses are convenient for busy people who might have difficulty keeping up with weekly assignments in a "scheduled" course, but who would have periods of time during the semester that would allow them to complete assignments and exams independently and at their own pace. The courses are offered through the Canvas online learning management system 24/7 through May 31, 2018. They are currently offered at no charge to U.S. high school, community college and technical college faculty. However, participants will be responsible for travel, lodging, and some meals to attend the optional 3-day laboratory capstone session at Indian Hills Community College in Ottumwa, Iowa.

For information and online applications, please visit:

- [Fundamentals of Light and Lasers](#)

knowledge and learning to be a self-motivated person who has the desire to be successful."

And "successful" describes Michael's career to date. He works for BrightView Technologies, a start-up company that manufactures optical films for the management of light distribution. Michael started as a technician for BrightView's main technology platform, called E-lamps. He says, "Today, I am responsible for the well-being of this whole system: everything from the optics alignment and calibrations of the system all the way to manufacturing, logistics, and process controls. It's very interesting; I'm in a world between research/development and manufacturing."

Read more about Michael and other successful technicians in [Success Stories in Photonics Careers](#).

OPCN Committees

The Committees of the Optics and Photonics College Network are dedicated to sharing expertise, best practices, resources, and advice on issues of importance to photonics technician educators at colleges throughout the United States.

Professional Development Committee

Anca Sala, Chair
anca.sala@baker.edu

Student Recruiting Committee

Christine Dossey
cdossey@op-tec.org

Program Assistance Committee

Gary Beasley, Chair
gbeasley@cccc.edu

Equipment Committee

Frank Reed, Chair
frank.reed@indianhills.edu

- [Laser Systems and Applications](#)

**For Previous Issues of the
OPEN Newsletter please
visit OP-TEC's [News Page](#).**

Using OP-TEC Videos to Prepare Students and Enhanced Lab Activities

Hands-on learning experiences are vital to effective education and training of photonics technicians. The lab activities included in OP-TEC's teaching materials not only reinforce the content of each module, they familiarize students with lab practices, safety, relevant industrial equipment and appropriate lab procedures, as well as equipment maintenance.

Each module in Photonics System Technician Course #1:

Fundamentals of Light and Lasers, 2nd Edition (FL&L), Course #2:

Laser Systems and Applications, 2nd Edition (LS&A), and Precision

Optics Technician Course: *Quality*

Assurance of Precision Optics

(QAPO), is supported by a detailed video of the lab activities, procedures and equipment. Faculty and students can obtain these videos from the OP-TEC website by clicking the following:



- [Videos for FL&L](#)
- [Videos for LS&A](#)
- [Videos for QAPO](#)

These videos serve as an introduction to each lab. They can be shown to the class prior to the lab, or assigned to the students to study prior to attending the lab session. Please review these videos and consider using them in the student labs.

Join the Conversation

We hope you enjoyed this edition of the OPEN newsletter. We would really like to hear from you. If there is some subject that you would like us to discuss or look into, please let us know at prmanager@op-tec.org.

OPEN is published by the National and Regional NSF Advanced Technological Education
Centers for Optics and Photonics Education.

This material is based upon work supported by the National Science Foundation under Grant No. DUE-1303732. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

