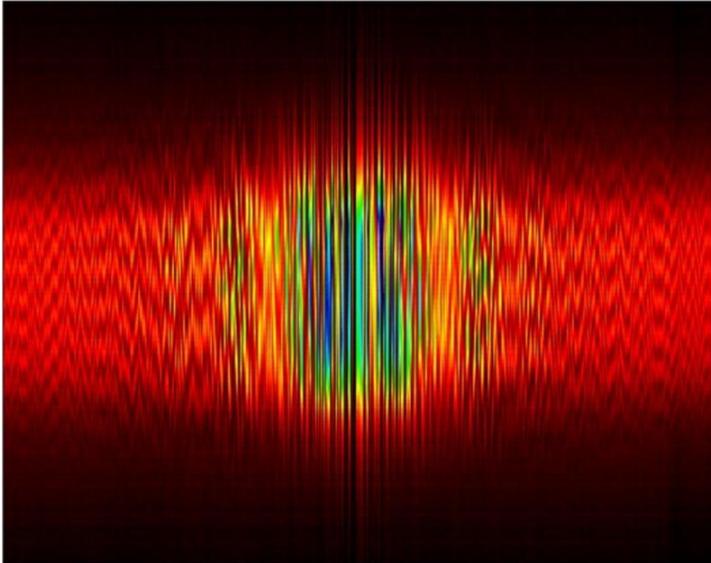


# OPEN Optics and Photonics Education News

Newsletter of the Optics and Photonics College Network

June 2019

## Is this F.R.O.G. Familiar?



An experimental interferometric frequency-resolved optical gating (FROG) trace of an ultrashort laser pulse from a Ti:sapphire oscillator.

*Travis N. Jones, Ultrafast Optics Group, Georgia Institute of Technology*  
[www.osa-opn.org/home/gallery/image\\_of\\_the\\_week/](http://www.osa-opn.org/home/gallery/image_of_the_week/)

## From the Executive Director



Articles in this month's issue feature laser applications emerging in medicine, summer recruitment events, and photonics technician program development.

Faculty professional development opportunities include summer workshops at MPEC and the OPCN meetings at the July HI-TEC conference in St Louis.

Last month, I announced the release of OP-TEC educational materials on our dissemination website [www.optecresources.org/](http://www.optecresources.org/). We are currently working with CREOL/UCF, LASER-TEC and SPIE to also place our materials on their websites. In addition, Brian Monacelli will begin creating online resources of OP-TEC materials, through an NSF/ATE grant to Irvine Valley College. These online resources will greatly facilitate delivery of laser and optics courses to students who are unable to attend traditional classes.

I look forward to seeing the OPCN faculty and program directors next month at the HI-TEC Conference!

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## Upcoming Events

06/10/19 - 6/13/19  
Laser Material Processing Workshop at Indian Hills Ottumwa, IA

06/24/19 - 6/28/19  
OP-TEC Online Course Hands-on Capstone Labs Indian Hills, Ottumwa, IA

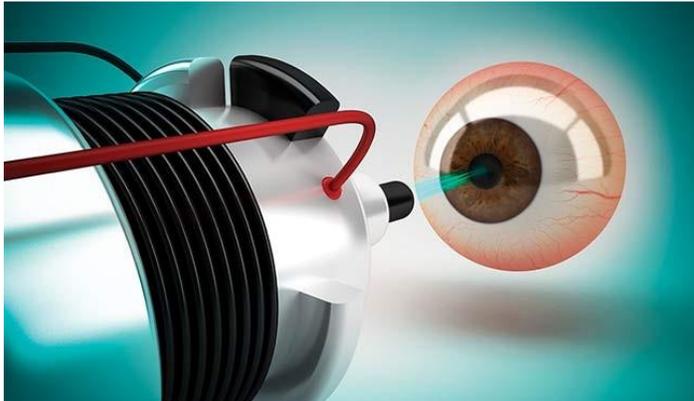
07/22/19 - 07/25/19  
High Impact Technology Exchange Conference St. Louis, MO

08/5/19 - 08/6/19  
Fundamentals of Photonics Workshop at Indian Hills Ottumwa, IA

## HI-TEC Fellowships & Conference Plans

Dan Hull

## Advances in Applications of Medical Lasers



New developments in laser technology have increased innovative applications in biophotonics, from tumor evaluations after surgery to ophthalmological treatments.

New applications have emerged in the following areas:

- Medical Imaging
- Coherent Raman Spectroscopy
- Optical Coherence Tomography
- Photoacoustic Imaging
- Laser Surgery

See: "Medical Lasers Find Their Niche"  
[www.photonics.com](http://www.photonics.com)

## SPIE Sponsors Prismatic Magic Laser Light Shows in the IHCC Region

SPIE (The International Society of Optics and Photonics) sponsored five laser light shows in the Indian Hills Community College region on May 7th - 9th. Prismatic Magic performed at regional schools in Ottumwa, Albia, Centerville, and Pekin engaged the audiences to sing along and clap to the popular music which accompanied multi-colored laser images. SPIE and Prismatic Magic collaborated with the Midwest Photonics Education Center to sponsor the shows as part of an awareness campaign to entertain as well as inform communities about the wonders of laser light and career opportunities in the field of lasers and optics.



Over 1200 students attended the SPIE sponsored Prismatic Magic Laser Light Show hosted by MPEC at Evans Middle School in Ottumwa, IA

The Kentek PHOTON1 Laser van also visited IHCC to provide unique demonstrations of laser safety equipment. PHOTON1, a Ford Transit 250 van with a high roof and extended body, is filled with interactive displays of Kentek's laser safety products. Around 70 students from technical programs, IHCC administrators and



The national and regional photonics centers will host the next annual in-person OPCN network meetings and photonics industry site visits at the HI-TEC Conference, July 22-25, 2019 at the Hyatt Regency at the Arch in St. Louis, MO.

The HI-TEC Conference provides an opportunity for educators to learn, network, give presentations, share best practices, and disseminate project resources with other STEM educators.

OPCN events are being planned for the HI-TEC Preconference on Monday and Tuesday, July 22-23. The general conference keynotes, presentation sessions, and exhibits will take place on Wednesday and Thursday, July 24-25. The NSF ATE Laser, Optics & Photonics Centers booth is #211.

As in previous years, OP-TEC will be offering conference registration codes for OPCN representatives to attend. OPCN Coordinators and Members will receive priority for these free registrations. Actively reporting OPCN coordinators may also request reimbursement for airfares following OP-TEC guidelines.

Interested educators should contact Christine Dossey at [cdossey@op-tec.org](mailto:cdossey@op-tec.org) to request registration codes and travel assistance.

## Photonics at LWTech

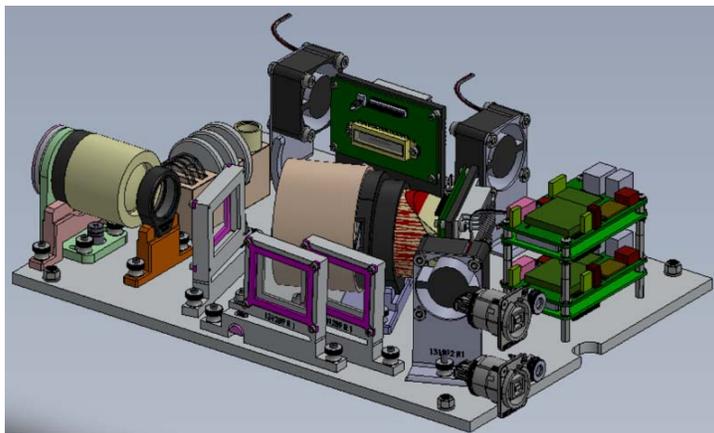


members of the Laser & Optics Technology Industry Advisory Committee experienced PHOTON1 during the visit. Colleges interested in hosting a visit from PHOTON1 should call 1-800-432-2323 or email [info@kenteklaserstore.com](mailto:info@kenteklaserstore.com).

**MPEC Summer Workshops:** MPEC is currently taking registrations for the following events: Fundamentals of Photonics Workshop held on August 5-6, 2019, Laser Material Processing Workshop held on June 10-14, 2019, and a Hybrid Online Laser Material Processing course with lab activities on July 8-12, 2019. The open entry online course is now open and all activities are free to participants with travel funding available. Register at [www.midwestphotonics.org](http://www.midwestphotonics.org).



### Curriculum Materials for Teaching Raman Spectroscopy to Technicians



Applications of visible and near-infrared spectroscopy are growing rapidly in forestry, medicine, agriculture, defense, homeland security, and food safety. Applications using Raman spectroscopy are particularly important because it is noninvasive, highly sensitive, and fast. Raman spectroscopy is used specifically in bomb detection, food safety, and early detection of cancer. The growth of these applications has resulted in increased demand for photonics/laser technicians with knowledge and skills in spectroscopy.

Completers of the Central Carolina Community College (CCCC) Laser Program are being hired by spectroscopy companies in NC, DE and FL, but the demand for technicians in spectroscopy is far greater than the supply. In response, CCCC has developed a module on "Advanced Spectroscopy", with focus in Raman, for inclusion in the "Laser Applications II" course, to complement the existing "Basic Spectroscopy" module (which uses the OP-TEC Spectroscopy Unit from the Photonics-Enabled Technologies Series).

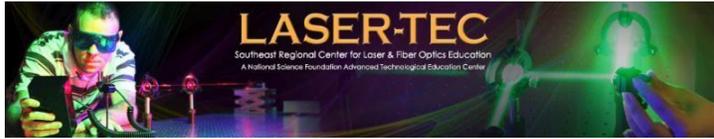
To provide "hands-on" experiences in Raman spectroscopy, CCCC collaborated with Wasatch Photonics, which employs many of its graduates, and developed an "open system" Raman spectrometer for educational lab use. This equipment enables students to gain the hands-on experience of building, aligning, and testing a Raman spectrometer. Gary Beasley (CCCC) is continuing to expand the hands-on learning experiences using this equipment.

Successful photonics technician education programs take time, perseverance, and connections to develop. Lake Washington Institute of Technology (LWTech) in Seattle began planning a photonics program in 2013. OP-TEC, Mentor Connect, Indian Hills Community College, and Irvine Valley College assisted with feasibility studies, program planning, curriculum design, technical support, laser lab safety guidelines, faculty development, and proposal preparation. In 2015, LWTech received an NSF/AATE project grant and a Special Projects grant from the State of Washington. LWTech faculty members have participated in OP-TEC online faculty development, attended the Optics and Photonics College Network (OPCN) meetings at the annual HI-TEC conference, and collaborated with Irvine Valley College and other colleges in the Western region of the US. LWTech's first photonics course was offered in fall 2016. Since that time, two additional courses were added, and a 75-credit Photonics Technology Certificate of Proficiency was established.

The college is now creating a Laser and Optical Technician (AAS-T) degree that will prepare students for entry level photonics related jobs in Seattle and beyond. The degree will build upon the college's existing core photonics courses: Fundamentals of Light and Lasers (LASR 201), Laser Systems and Applications (LASR 210), and Communications, Imaging and Remote Sensing (LASR 220). Additional photonics courses are being considered.

LWTech conducted its second annual advisory committee meeting May 23, 2019, receiving excellent feedback from its industrial partners related to the new AAS-T degree program. LWTech faculty and staff supporting the program are Hany Roufael, Stephanie Bostwick and Michael Richmond.

OPCN members who are interested in exploring the addition of Raman spectroscopy to their coursework should examine a detailed report on this development in the LASER-TEC website, [www.laser-tec.org](http://www.laser-tec.org). Opportunities to acquire the Raman spectroscopy lab equipment can also be obtained from LASER-TEC.



## NSF Grant to Develop Online Versions of OP-TEC Courses



Irvine County College (IVC) has received an NSF/ATE grant to continue supporting and mentoring Western US colleges that are developing and improving Laser and Optical Technology programs. IVC PI, Dr. Brian Monacelli, is collaborating with Stephanie Bostwick of Lake Washington Institute of Technology to develop online educational resources for sharing curricula with the partner colleges in Western United States. OP-TEC has granted Brian the use of its text materials for Quality Assurance of Precision Optics and Metrology of Optical Systems, to create the online resources.

These new resources will facilitate serving a larger geographical range of students by offering online lectures with periodic capstone laboratory experiences, similar to the model created by OP-TEC for instructor training.

Following the completion of online resources for these two courses, OP-TEC, LASER-TEC and IVC will consider the development of similar resources for OP-TEC's other student materials in optics and photonics. When the resources for each course are completed, they will be made available for use by all United States colleges teaching optics and photonics technicians.

## PACT Alumni Spotlight



**Chris Baggett** chose photonics as a second career. He started out as a private investigator and owned his own highly successful investigation company for twenty years. Wanting to make a change, Chris enrolled in the Laser and Photonics Technology program at Central Carolina Communication College.

He found the classwork stimulating and fun, in part because of his love of math and science. Chris speaks highly of Professor Beasley. "He cares about what he's doing; he cares about his students. I've never met anyone like him." The program was rigorous, but he graduated at the top of his class.

Chris works for Northrop Grumman as an operator level 2. "My coworkers and I, we're always talking about math and different ways to do things," he says. Thanks to his degree from CCCC, Chris has been given many responsibilities that are generally reserved for those who have been working in the field for years. Chris's two-year associate degree in laser and photonics technology gives him a significant advantage in the workplace and makes him more valuable to his company.

"If you go for a technical degree you will get a job. There is no doubt in my mind."

Read more about Chris and other successful technicians in Success Stories in Photonics Careers (downloadable PDF at [www.optecresources.org](http://www.optecresources.org)).

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



**2019** High Impact Technology Exchange Conference  
JULY 22-25  
ST LOUIS  
Sponsored by the NSF ATE community  
highimpact-tec.org  
Educating America's Technical Workforce

### 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](mailto:prmanager@op-tec.org).

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