

# Adult Learners

## Upgrading Your Career



Photonics Alumni Council for Technicians

**OP-TEC**  
National Center for Optics and Photonics Education



## **About OP-TEC**

The National Center for Optics and Photonics Education (OP-TEC) is a National Center of Excellence, sponsored by the National Science Foundation's (NSF) Advanced Technological Education (ATE) program. The mission of OP-TEC is to increase the supply of well-prepared photonics technicians by building and strengthening the capacity and quality of photonics education in U.S. two-year colleges. Thirty-five U.S. colleges are offering associate degree programs in Laser and Photonics Technology.

## **About PACT**

Since 1980 these colleges have graduated several thousand laser/electro-optics and photonics technicians. Some work in communities near these colleges; others are working throughout the country and in other parts of the world. All the graduates of these programs have found employment, and most are still engaged in highly rewarding careers. In early 2009, OP-TEC founded the Photonics Alumni Council for Technicians (PACT). Faculty from colleges teaching photonics nominated former students who were recognized for their technical achievements and leadership abilities. Fifty eight alumni were selected. This booklet presents interesting and informative bios from a selection of these PACT members.

The Purposes of PACT are:

- To recognize excellence and success in photonics technicians.
- To show the diversity of employment opportunities for photonics technicians.
- To provide role models and mentors for photonics students and for high school students who are considering a career in photonics.
- To advise photonics-technician students on how to be successful while in school, why they should complete a degree or certificate, how to get a job after graduation, and how to be successful at work.

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# Preface

Photonics technicians and laser/electro-optics technicians: Who are they? What do they do? Where do they come from? How are they prepared? What can they become? Why do we need so many of them? This book answers these questions by examining the lives and careers of 10 exemplary photonics technicians.

These technicians were all educated in two year associate degree programs at U.S. community and technical colleges. After completing high school they chose to go to work in a job requiring low knowledge/skills, or they entered higher education in an unrelated field; frequently in a major that did not prepare them for a career. Through a variety of experiences these adults learned about photonics and decided to return to college and prepare to become photonics (laser/optics) technicians. They discovered that rewarding careers in lasers and optics were available for hands-on learners who complete these college programs. In college they found the technical courses interesting and achievable. When they completed their coursework they had multiple job offers that paid good salaries. They are now employed in interesting, well-paying jobs, with unlimited career opportunities.

Today, more than twenty thousand photonics technicians are at work in businesses, laboratories, government, hospitals, defense industries, and educational institutions. U.S. employers need at least eight hundred new photonics technicians each year! Technicians are an essential component of the photonics team: scientists, engineers, and technicians. Technicians are uniquely qualified to be the geniuses of the lab and the masters of the equipment. And these professionals provide a backbone for an industry that is keeping our country safe, healthy, and economically competitive.

Fred Seeber, PhD, Professor  
Camden County College

Dan M. Hull, Executive Director  
National Center for Optics and  
Photonics Education

# Introduction

## What is Photonics?

We live in a world bathed in light. We see with light, plants draw energy from light, and light is at the core of most emerging technologies. The field of optics deals with phenomena, components, systems, and techniques that control light and enable it to perform useful tasks. Lasers provide coherent light and are a part of numerous electro-optic devices and applications, which together make up the field of photonics, encompassing optoelectronics, micro-optics, lasers, digital imaging, spectroscopy, optical instruments, and optical systems.

Companies that are focused on optics and photonics create more than 10% of all US public company revenues and 6% of public company jobs. The global market for lasers was nearly \$10.8 billion in 2014. This market is expected to reach \$11.7 billion in 2015 and \$16 billion in 2020, with a compound annual growth rate (CAGR) of 6.5%.<sup>1</sup>

Today, photonics is not only a technology field in and of itself but also an enabler of nearly every other technology field, including solar energy, telecommunication, micro- and nanotechnology, information technology, biotechnology, biomedicine, precision measurements, materials processing for manufacturing, remote sensing, solid state lighting, electro-optics displays and imaging, national defense, and homeland security. Recent advances are enabling a revolution in world fiber-optic communications, new modalities in the practice of medicine, enhanced scientific research, a more effective national defense system, advanced manufacturing, and much more.

Companies that focus on optics and photonics create more than \$3 trillion in revenues—ten percent of all U.S. public company revenues. They create 7.4 million jobs—six percent of public company jobs. The global market for lasers was nearly \$10.8 billion in 2014. This market is expected to reach \$11.7 billion in 2015 and \$16 billion in 2020. Photonics-related companies number more than 5000 and their net financial impact amounts to more than \$50 billion annually.”

## Photonics Technicians

The technical teams that create and improve photonics devices and systems in our country’s industries and laboratories are composed of a “three-legged stool”: scientists, engineers, and technicians. Scientists explore and discover new phenomena; engineers design new devices,

systems, and processes; and technicians make these new devices, systems, and processes work. Technicians are the “geniuses of the lab” and the “masters of the equipment.”

Photonics technicians are educated and trained in the practical aspects of photonics. They are proficient in the principles and applications of optics and lasers, as well as components, devices, equipment, techniques, and safety aspects used in the development, systems integration, operations, and maintenance of photonics equipment. They work in laboratories, manufacturing facilities, hospitals, field service, sales, and a variety of places where lasers and other photonics devices are used. Some photonics technicians work in teams composed of engineers, scientists, and possibly marketing or sales people. Other technicians work independently. Some photonics technicians own their own businesses.

<sup>1</sup> BCC Research LLC. (2015) Global Markets for Laser Systems, Components and Materials. Available at <http://www.bccresearch.com/market-research/photonics/laser-systems-components-materials-global-markets-report-pho002b.html>

# Robert Aguilar, Jr.

Texas State Technical College

**R**obert Aguilar, Jr., has been changing people's vision for eleven years. "I got into the beginning of Lasik eye surgery," he explains. "Ten years ago, it was in its infancy. It was an amazing procedure, being in the O.R., assisting doctors in surgeries." But helping people see clearly isn't all Robert does. He loves to give people bright visions of their futures.

***On being successful: "If you're not dedicated, you're not going to succeed. If you're dedicated, the sky is the limit."***

Robert began work on a four-year engineering degree but, like many people, ran into financial and family issues. He went home to help his parents and started a construction company with his father. While there, he met his wife, who was studying at Texas State Technical College (TSTC). He recalls, "I saw the brochure about laser electro-optics and thought, 'Wow! I like lasers!' I've always liked working with my hands." Robert decided to pursue an associate in applied science degree in laser electro-optics technology (LEOT) at TSTC. Just before he graduated, he was offered a job working with cutting-edge technology applications. He says, "A company called LaserVision Centers picked me up for my laser background. They worked with lasers that perform Lasik eye surgery."

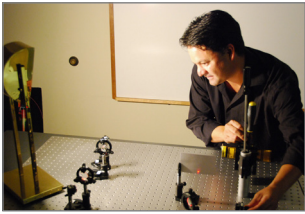


Ever since, Robert has been in the medical field of laser applications. Now he trains people to service medical lasers and follows up with continuous-improvement programs. Robert has strong feelings about post-school learning. "Working with photonics, you're looking at a lot of on-the-job training," he explains. "You're always learning something new. You're never just taught one thing and then do that for ten or twenty years. You're always broadening your mind. Eleven years after completing my AAS degree, I'm still learning, still trying to better myself."

Robert's philosophy of self-improvement has helped him skyrocket from level-one technician to director of operations at WaveLight, a company that was recently bought by AlconLabs. He explains, "With Alcon, there's room for even more advancement. They're such a huge company, the sky's the limit."

Robert wants to give back to the industry that has given him so much.

One of his future goals is to return to TSTC as an instructor. He says, “All you do, as some of the instructors say, is play with lasers and instruments all day.”



Balancing work, study, and raising a family almost overwhelmed him at times. “The hardest part of completing my degree was working a full-time job while taking classes,” he remembers. “But it was because of the instructors’ encouragement that I stayed. They were amazing mentors and showed me guidance in a way I never expected. That’s what pushed me to stay and work long hours to complete the program. Now it’s paid off, not just economically, but mentally. It’s been wonderful.”

Robert’s quick laugh and genuine smile make it clear that he loves what he does. “I enjoy it so much,” he says, “I have a smile on my face every day.” In fact, he tells many of the people he meets about the opportunities available in photonics. “I met a gentleman at the airport whose son didn’t know what he wanted to do,” he says. “I recommended he visit TSTC and take a tour. He did, and graduated with a 4.0 GPA. Just five years ago, he didn’t know what he wanted to do. To know I had a hand in that is very fulfilling.”

*Robert Aguilar, Jr., graduated from Texas State Technical College in 1999 with an associate in applied science degree in laser electro-optics technology. He lives in Woodway, Texas, with his wife Anjanette Aguilar and sons Alexander Aguilar and Jordan Carey.*

# Paul Leech

Camden County College

**P**aul Leech worked as an auto technician at General Motors before deciding to pursue a photonics degree at Camden County College (CCC). He had just finished high school at the time, and the work and pay seemed decent for a young person just starting out. Because he was a skilled technician, Paul quickly rose to the top of his field. He realized, though, that the top came a bit too quickly. “I found the salary was starting to plateau quite quickly, and it was too low for my liking.” When Paul looked into the future, he realized that his chosen career path wouldn’t offer him the kind of ongoing challenge that he was looking for. Paul’s good friend had completed the photonics program at CCC and “started a nice career that showed a lot of promising success.” Paul realized that the careers that his friends had chosen gave them “unlimited opportunity to grow.” Wanting the same for himself, Paul decided that his next step would be to earn an associate of applied science degree.



***On opportunities in technology: “I obtained a job before I even graduated. I’m now the co-owner of Photonics Services Group.”***

Paul was excited to start this part of his life over, and eager to discover the opportunities and challenges that his education would give him. He went into the photonics program with few expectations other than “learning a lot of science, math, and physics,” but soon found an excellent job opportunity. “That good friend helped me obtain a job at (scientific and medical laser manufacturer) ConBio before I even graduated from CCC,” Paul explains. With such a great opportunity lined up, Paul was extremely motivated to complete the program successfully. For two years, he spent his nights working at UPS and his days working even harder to earn his education. When Paul completed his degree and had the opportunity to work as a field service technician at Hoya ConBio, he was thankful that his friend had helped him pursue his dream of working toward a rewarding career.

After working with ConBio, Paul worked as a urology laser technician for Mackin Medical and then as a field service technician for ICN Pharmaceuticals. Eventually, he and three others cofounded a company called Photonics Service Group, Inc. The recession was as hard on his



company as it was on most companies, but Paul stuck with it. “I was proud to get through the recession and hit our ten-year anniversary of the company,” he says. Now, Paul is not only a co-owner and field service technician for his company, but also its vice president. Eventually, Paul expects to either sell the company to a larger corporation or take the company public.

Paul is proud of how far he has advanced and believes that his story can serve as an inspiration for those just beginning their careers. Paul’s three core values are integrity, honesty, and communication, which he believes help him create strong and prosperous relationships with clients, customers, and partners. Paul believes that these three qualities, combined with hard work, will allow anyone to grow and succeed.

*Paul lives in Haddon Township, New Jersey where he grew up. He often takes his family camping in Jersey Shore. He also enjoys outdoor sports and mountain biking.*

# Michelle I. Redish

Central Carolina Community College

**M**ichelle I. Redish goes to work knowing that what she's doing will make a difference. As a laser technician and proud employee of Northrop Grumman Corporation, her work contributes directly to our nation's homeland security.

A family connection inspired Michelle to focus her studies on photonics. "I went to a four-year university," she explains, "but I didn't know what I wanted to do. I spent two years switching around from chemistry to psychology to accounting. I came home for spring break and saw that my mom, who is now also a laser technician, had signed up at Central Carolina Community College (CCCC) and was taking laser and photonics courses. She told me a little about lasers and photonics and set up a tour with Mr. Gary Beasley. I saw some of the applications for which a laser can be used, and I was hooked. I wanted to do that. It was like that little light bulb going off. The same day, I transferred from the university to CCCC."



***On doing what it takes to reach her goals: "I challenged myself. I said, 'I'm going to be the top of my class.' That was my goal, my focus: not only to learn what's necessary, but to be the best at it."***

At first, classes were a little awkward. "The classmates didn't know each other, so they were very quiet in class," Michelle recalls. "They didn't know we could talk to one another. But as the year went on, we realized that if we wanted to make it through, and most did, we had to work together. Teamwork is a major factor." And Michelle was determined to do everything she must to succeed. She challenged herself to be at the top of her class. Her goal was not just to learn what was necessary, but also to be the best at it. Michelle achieved her goal and, as a result, was able to get exactly the job she wanted.

Michelle describes her work this way: "I build the lasers that are a part of the protective defense of airplanes for soldiers going to Iraq and Afghanistan. I can't tell you exactly what it does, for security reasons,

but the laser redirects any oncoming missiles.” Having recently been promoted from laser technician I to laser technician II, Michelle also works on a program for land forces, creating thermal-view range finders. “It is a measuring device for both short and long distances,” she explains. “A soldier can look through the range finder and tell his commanding officer, ‘We see an enemy at this location, this many feet away.’”

Michelle’s future is bright, and full of photonics and optics. “I’m planning to go back to school to get a bachelor’s degree in either optical engineering or chemical engineering,” she says. “There are certain coatings that go on optics components. I’d like to be a part of devising new and better ways to make those coatings.” No doubt Michelle’s focus and passion for photonics will take her exactly where she wants to go.

*Michelle I. Redish earned an associate in applied science degree in lasers and photonics technology and a certificate in electronics engineering technology in 2006 from Central Carolina Community College in Lillington, North Carolina. She lives in Sorrento, Florida, goes to the beach every weekend, and regularly sings at Disney World with her music group Sing Live USA.*

# Christopher Moulton

Baker College in Flint



Photos courtesy of J. Garland/IPG Photonics Corporation

**C**hristopher Moulton found the Photonics and Laser Technology program at Baker College in Flint, Michigan, almost by accident. After the propane delivery company where he had worked for ten years let him go during downsizing, he went back to college and began taking classes for an associate degree in computer animation. Toward the

end of his degree track, Christopher realized that computer animation wasn't the right type of career for him. He was looking for a field that wasn't as popular, whose job market wasn't already saturated with employees. One day, during his morning cup of coffee, an newspaper advertisement caught his eye: Baker College was starting a new program called Photonics and Laser Technology. Right away, Christopher was interested. "It was new, it was exciting, and it was something I could see myself doing," he recalls. He took a leap of faith and signed up almost immediately—he signed up so quickly, in fact, that when he called Baker College to enroll, the person he spoke to on the phone hadn't even heard of the Photonics and Laser Technology program.

Initially, there was a big learning curve for everyone in the program, Christopher recalls. The most difficult part, he says, was the newness of the program and the fact that his was the inaugural class. Being the first wasn't always an advantage, because professors were still learning to teach the material and didn't always have answers on hand. Despite the bumps in the road, Christopher found his coursework interesting. His first year of classes emphasized electronics and offered a foundation that laid groundwork for the second year, by which time lasers and optics played a role in nearly every class. In December 2015, Christopher graduated from Baker College with an associate of applied science degree in photonics and laser technology.

Christopher now works for IPG Photonics as an Applications Technician. He currently spends his time learning about laser welding, laser cutting, trifocal brazing, setting up different applications in the labs for the engineers, and learning to work with the automated and robotic parts of

the facility. He is slated to work on a specific piece of equipment once it arrives at the facility.



Photos courtesy of J. Garland/IPG Photonics Corporation

Christopher sees himself moving forward in his career with IPG. The possibilities for job placement and advancement are nearly endless, thanks to his degree in photonics and laser technology. "There are job opportunities anywhere and everywhere," Christopher says. He believes that Baker's photonics and laser technology program gave him

a strong groundwork for a career because it touched on many different aspects of photonics technology. He recommends a degree in photonics as a great jumping-off point and has seen for himself how marketable and hireable technicians are.

*Christopher Moulton graduated from Baker College with an associate of applied science degree in photonics and laser technology in December 2015. He lives in Holly, Michigan, where he enjoys hunting, fishing, bowling, and spending time with his kids and family.*

# Trenton Northup

Indian Hills Community College

**T**renton Northup was working for his stepfather when he first heard about the Laser and Optics Technology program at Indian Hills Community College (IHCC) in Ottumwa, Iowa from an old high school classmate. “He was telling me all the perks about his job that he has now and all the good things about Indian Hills,” Trenton recalls. Trenton’s friend had already graduated from Indian Hills and was full of praise for the Laser and Optics Technology program and the opportunities that the field affords. Trenton was won over by the glowing recommendation and decided to enroll.



***“It was so intriguing, and I never got bored with it. It kept me on my toes. I kept learning new things every day.”***

Trenton says he “had no idea what to expect going in” but found himself very interested in the classes and material. He believes that studying lasers and optics is something that just about anybody can do. “You don’t have to have a background in lasers and stuff like that to fall in love with the field,” he says. Trenton’s family wasn’t familiar with lasers and optics, but they enjoyed hearing about what he did during school. His family supported him “100 percent” as he pursued his degree in a field he had come to love.

Trenton speaks very highly of one of his professors, Frank Reed. “I don’t know how to put into words how great a teacher he is,” Trenton says. He found it comforting and heartwarming that someone with Frank’s experience was so passionate about new students who were just beginning to learn about lasers and optics. “He would do anything and everything for us,” Trenton says, and it was clear to him and the rest of the students that Frank was invested in them and wanted them to succeed.

Before they graduate, students in the Laser and Optics Technology program are encouraged to contact companies who have hired Indian Hills Community College graduates in the past. Trenton says that students are given a booklet that lists more than seventy-five companies and their contact information. “I was really surprised,” he says, “just

how many there were and how quickly some of them responded.” Once he’d let a few places know that he was going to graduate from IHCC’s Laser and Optics Technology program, they were eager to hire him. Students from this program are so highly valued that companies travel to the Indian Hills campus every March to conduct on-site interviews for students who don’t have the time to travel and interview elsewhere in the country. Trenton had received four job offers by the time he accepted his current position at Lawrence Livermore National Laboratory in California. He also had to turn down second-round interviews with two other companies and a paid-for trip and facility visit to another company.

Trenton graduated in May 2015 and is currently a Laser Research Engineer/Technician Level 4 at Lawrence Livermore National Laboratory. He works in the control room at the National Ignition Facility (NIF), where he is responsible for laser-beam alignment. Trenton is excited to be working at NIF because he is part of groundbreaking research in the laser field. He says, “I wanted to be where the action is, and that’s what this job is.” “Any day, something new could happen, and I learn something new every day.”

Trenton says the primary goal at the NIF is to achieve ignition, which would provide a new source of sustainable energy. He loves what he does, in part because, his work has the potential to change the way people use and think about energy, and he sees himself staying in his job for a while. Since starting at Indian Hills, he says, “I’ve never looked back.” His message to students interested in the Indian Hills program: “I guarantee that you will not regret going into this field. It’s awesome, it’s challenging, and it’s so interesting.”

*Trenton Northup graduated from Indian Hills Community College in May 2015 with an associate of applied science degree in laser and optics technology. He currently works at Lawrence Livermore National Laboratory in Livermore, California.*

# Dr. Bruce Brinson

Texas State Technical College

**D**r. Bruce Brinson describes his life as “a random walk.” At first, photonics was not a driving passion. “I didn’t have visions of Star Wars,” he recalls. “I was looking for schools.” A coworker at his auto-repair shop told him about a man in Germany who worked with lasers and had been educated in Waco, Texas, at Texas State Technical College (TSTC). “I looked into it,” he says, “and talked to John Simcik (a former TSTC faculty member), who is a motivating guy, to say the least. I drove over to Waco, talked to John and some other people in the department, and moved into the dormitory that day.”

***On teamwork: “Problems are rarely solved by individuals working alone. There are almost always two or more people involved.”***



Upon completing his associate degree, Bruce was hired by the Department of Electrical and Computer Engineering at Rice University in Houston, Texas. “I was working with lasers and electronics,” he says. “I saw systems that people like Jerry Reay (a former TSTC faculty member) said we would learn about but were ‘never going to see in the real world.’ Well, I saw them, and I built them.”

Bruce had hoped to finish an optical engineering degree at the University of Houston at Clear Lake, but the program was dropped soon after he began working at Rice. “I kind of let that go,” he recalls, “but then while at Rice, I said to myself, ‘You know, I can take classes at Rice for free. It could take ten years to get a degree out of this, but what the heck?’” Eventually, Bruce earned a bachelor’s degree based on his coursework at TSTC and Rice.

In his bachelor’s degree program at Rice, Bruce researched Bucky balls, nanotubes, and other carbon nanostructures. This research fueled his desire for a master’s degree. “I could take this and run with it,” he thought. But no Rice employee had ever been allowed to earn a Rice degree while working for the university. Bruce planned to resign his position and enroll as a graduate student at Rice. He explained his plan to Professor Naomi Halas, for whom he would be working. As far as Professor Halas was concerned, Bruce’s plan was a “no brainer,” so she “rocked the foundation” at Rice, and Bruce was accepted without having



to resign. Bruce followed his master's degree with doctoral work. "All in all, the pieces were in place," he says. "I was simply blessed."

Bruce was blessed by circumstance, but he was also blessed by a tenacious patience that allowed him to slowly but surely find the means to further his education. Plenty of encouragement came from mentors and friends as well. Concerns about the cost of tuition were eased by words of wisdom from Dr. Dial Martin, a retired faculty member of Texas A&M University. He said to Bruce, "If you really want to go back to school and you find a way to get in, you'll find a way to stay." He was right.

In his spare time, Bruce has become one of the top amateur country and western dancers in the Houston area. "I danced and danced," he says, "and when you practice, you excel." That philosophy has served Bruce in many parts of his life. Now, TSTC can count among its alumni one of today's most promising researchers and developers of new photonics and nano technologies.

*Dr. Bruce Brinson of Pasadena, Texas, recently received his Ph.D. in photonics and nano engineering from Rice University in Houston, Texas. He also holds a master's degree in photonics and nano engineering from Rice, a bachelor's degree in optical technology from Regents College in Albany, New York, and an associate in applied science degree in laser electro-optics technology from Texas State Technical College.*

# Jason Troyano

Indian River State College

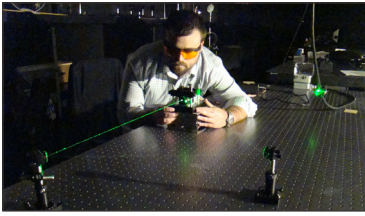
**J**ason Troyano's desire to pursue an associate degree in electrical and engineering technology began when he was fueling airplanes at a local airport in Florida. He was a line service technician for Key Air Inc., where he was responsible for all pre-flight services of aircrafts, including meeting safety regulations, performing maintenance and quality control inspections, and documenting his work. It suddenly dawned on Jason that he should pursue an education in electronics. "I have always been interested in the study of light," he says, and he recalls the moment he learned "that everything we see has no color until the light bounces off of the object."

***"My professors guided me and gave me excellent knowledge to better myself, not only in photonics, but in life as well."***



Jason visited Indian River State College (IRSC) and found that "they had the exact program I wanted to get into: electronic engineering technology." Jason embraced this opportunity and immediately signed up for their Robotics and Photonics Institute. Jason began his studies eager to learn about the nature of light and determined to succeed. Looking back now, he says, "Nothing could have prepared me for the series of events that would take place after that." While Jason was in school, Key Air Inc. went out of business, which left Jason unemployed. "With my new frame of mind, I did not despair," Jason recalls, and he instead focused on his new goal.

"Once I began the robotics and photonics program, my positive attitude and hard work really began to pay off," Jason says. In 2012, IRSC's Robotics and Photonics Institute offered Jason a job as an instructional aide, which allowed him to learn even more and gave him additional hands-on lab experience. Jason was responsible for maintaining inventories of parts and components, ensuring that equipment was functioning properly, assisting in the design and development of lab experiments, and helping students perform their labs. "I enjoyed myself thoroughly," he recalls. In fact, one of Jason's proudest moments was when he fixed the projector system in his school planetarium. He experienced how it felt to use his knowledge in a real-life application, and "it was very rewarding."



Jason believes that his education helped prepare him for the real world. He explains, “My professors guided me and gave me excellent knowledge to better myself, not only in photonics, but in life as well.” Jason graduated from IRSC in May 2013 with an associate

degree in applied science in electrical engineering technology.

As his education was nearing its end, Jason began applying for jobs both in photonics and in healthcare, keeping in mind that his ideal career would involve a mixture of both. Though he was unsure which job he would land, he explains, “I knew I would hear back from the right job.” General Electric contacted him for a job interview and offered him a job a few weeks later. “Needless to say, I took it,” Jason recalls, “and I was beside myself.” In his new job, Jason is responsible for maintaining MRIs for General Electric. “This career is the perfect combination of healthcare, photonics, and cutting edge technology that I was hoping for,” Jason says. Jason’s talent for troubleshooting and repairing electrical equipment is not the only advantage that he brings to General Electric; he also has strong communication skills and enjoys working with teams.

Looking back on how far he has come, Jason has become convinced that as long as people stay focused on their goals, “a positive attitude will take you anywhere and everywhere in this life.” With a bright future ahead of him, Jason is grateful for his decision to pursue a technical education. “Technology is everywhere,” he explains. “It impacts your everyday life now.” He believes that to overlook technology as a career prospect is to miss out on a great opportunity. “It’s worth taking a second look at,” he advises.

*Jason recently moved to Miami, Florida to pursue his career with General Electric. In his spare time, Jason enjoys fishing, kayaking, playing board games and cards, and watching movies.*

# Kevin Rodgers

Camden County College

**K**evin Rodgers began his college life in the 1980s at Rutgers University, where he loved his role on the university's hockey team but had no academic or career goals to keep him moving forward. A family friend noticed Kevin's lack of direction and drive and called his friend, Dr. Otto R. Mauke, who was the president of Camden County College (CCC) at the time. Dr. Mauke recommended that Kevin speak to Fred Seeber, who coordinated Camden's Laser Electro-Optics Technology (LEOT) program.

Kevin remembers that during one of their first interactions, Dr. Seeber told him that he would be a good fit for the program. It was the first time anyone had said that to him during his collegiate career, and it made him feel good about himself to hear it.

Kevin entered the program expecting a cookie-cutter learning experience: a lecture hall, large classes, and tests to pass. What he found was a dynamic environment, full of hands-on projects and practical experience. "The hands-on experience was incredible," he recalls. Dr. Seeber had convinced numerous companies to donate lasers to the program, and these lasers allowed Kevin and other students to do independent studies, perform experiments, make holograms, learn how to align and operate lasers, and much more. As Kevin points out, it wasn't only the laser-based classes that offered hands-on practice: building electronics, making accurate mechanical drawings, and working in the machine shop were all integral to the program. Kevin says that the Laser Electro-Optic Technology program at Camden County College "really set me up for what I did in my future work. I can't say enough about the program."

This was the early 1980s, and lasers were still a new and emerging technology and "not something people were generally studying at the time." Kevin found his coursework exciting and challenging, especially because he decided to pursue an associate of science degree in engineering in addition to an associate of applied science degree in lasers and electro-optic technology. He earned both degrees in 1983, and in 1994, he earned a bachelor of science degree in electrical engineering from Drexel University.

Kevin is currently the President of Precision Laser Specialist Inc., where he works as an engineer in addition to his presidential duties. His

company services medical lasers in offices, clinics, hospitals, and other medical facilities. One of the challenges of his position is making sure his engineers and technicians have the know-how, documentation, and parts necessary to service the many different types and models of lasers that they work on. His job also involves finding substitution parts when a manufacturer won't share parts, and he finds it highly satisfying to be able to do the research and understand the lasers well enough to find appropriate replacement parts.

Kevin takes pride in making sure that every customer need is met and that customers are satisfied with the job, but what he likes best is knowing that his employees are happy working for him. He has now been in this business for about twenty years and is proud that he still has a great reputation for doing a good job and that the service he offers is of such high quality that he's been able to keep many of the same customers for all twenty years.

*Kevin Rodgers graduated from Camden County College in 1983 with an associate of science degree in engineering and an associate of applied science degree in laser and electro-optic technology (now known as associate of applied science in laser/electro-optic technology). He is very involved in his community and sits on several local boards and committees. Kevin enjoys camping and hiking with his family, golfing, and playing hockey.*

# Jessica Hudson

Central Carolina Community College

**J**essica Hudson is very proud of her career in photonics. During her time as a cashier at a grocery store, she reflected on which career would be right for her. She decided to attend Central Carolina Community College (CCCC), but was unsure about what degree she wanted to pursue. “I’m not one of those people who studied photonics and knew that it was the field I wanted to go into,” Jessica says. “Student services recommended the laser and photonics program after I completed my placement test.” Photonics was something new for Jessica, and she was impressed by the endless job opportunities that the field offered. The advice she received from student services convinced her that photonics would be right for her.



***On lifelong learning: “I am very proud of the field I have chosen, because it has been a great learning experience. Every day, I learn something new, and that makes my job more interesting.”***

As a new student in CCCC’s laser and photonics program, Jessica had no idea what to expect, but she did expect to learn a lot about lasers. Initially, the program was harder than she had expected, since she had begun the program without any prior experience with photonics. “Almost everyone else had already been in there taking workshops,” she recalls, “So I felt behind.” Instead of letting these feelings discourage her, Jessica stayed focused on her goal to finish the program successfully. She studied hard, and she started getting the hang of it. She explains, “I began the classes, and the semesters went by, and I realized how much I enjoyed learning about lasers and how they worked.”

Jessica says that the hardest part of the laser and photonics program was the amount of time and studying that it demanded. “You have to put yourself in that mindset,” she explains. Jessica was clearly in the right mindset, because as the semesters went by, she became increasingly interested in “how light can be used to our advantage.”

Jessica completed her associate degree in laser and photonics technology in 2012, and since then, she has been working as an engineering technician with Wasatch Photonics. Her responsibilities

include using computer programs to assemble, test, and calibrate spectrometers. Jessica is proud of what she has learned about spectrometers, and she explains that “assembly includes circuit-board population, bonding optics, alignment, and collimation.”

Jessica enjoys photonics because it allows her to constantly learn and face new challenges. “I am very proud of the field I have chosen, because it has been a great learning experience,” she says. “Every day, I learn something new, and that makes my job more interesting.” Jessica admits that the commute to and from work is not the most pleasant part of her day. However, she loves where she lives, and she loves where she works, so she finds her job to be worth the time spent in traffic.

Jessica is excited about the future at Wasatch Photonics. When she first started working there, the company was relatively small. Lately, though, the company has been considering expanding, and Jessica hopes to be a part of this growth and development.

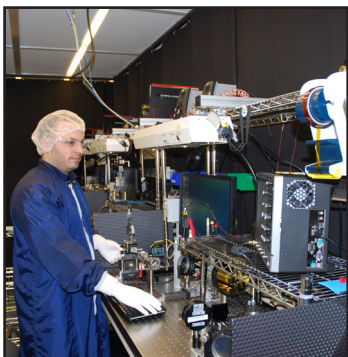
Jessica’s career and education have taught her to believe that anyone with the willpower to study and work hard can succeed. She believes that if students are interested in pursuing photonics, “they should go for it.” Jessica’s experience shows that a student does not need a background in the subject to successfully learn the material. What Jessica lacked in experience, she made up for with passion and determination. She believes that students who share her interest in photonics can do the same.

*Jessica lives in Bunnlevel, North Carolina. While she is not working as an engineering technician, she likes going out with her friends. Because she lives in the country, she frequently enjoys driving four wheelers.*

# Aaron Schwehofer

Indian Hills Community College

After **Aaron Schwehofer** graduated from college in 2007, he began a career teaching industrial education at Grant Community High School in Fox Lake, Illinois. One day, Aaron’s principal asked him to look into updating the curriculum to include an introduction to the field of photonics. While researching photonics, Aaron became very excited about the subject matter, as well as the career opportunities in the field. “Everything I was learning about photonics made me more assured that photonics was the career for me,” he recalls. “I decided to research colleges with two-year degree programs, and was most impressed with Indian Hills Community College (IHCC).” After three years of teaching, he finally took the plunge and enrolled in the Laser and Optics Technology program at IHCC. He couldn’t be happier with his choice—as he says, “Choosing a different career path to obtain an associate of applied science degree in laser and optics technology at IHCC has been the best career decision I have made at this point.”



***“I think it’s important that you go for a career that you would enjoy and that pays the bills. I encourage people to look into it and see what types of careers are out there, because there are endless number of careers in photonics. Do your research, and see if photonics is for you.”***

For Aaron, the most challenging aspects of completing his degree had to do with balancing work and school. To pay the bills, he needed to work three jobs, all while attending school full time. But he kept his goal in mind, and he knew that if he kept pushing forward and managed his time efficiently, his vision would become reality. Today, he recommends that students think about both financial opportunity and personal satisfaction when they’re considering a career:

After graduating from IHCC in 2012, Aaron began working as a Manufacturing Laser Technician for L-3 Insight Technology, a military contracting company located in New Hampshire. His responsibilities include troubleshooting and testing diode-pumped solid-state laser



systems. He also is responsible for cleaning and grading optics, communicating with suppliers, writing work instructions for multiple production lines and training of production personnel, maintaining clean-room protocol, and testing lasers systems at the design level.

Aaron finds working at L-3 Insight Technology rewarding for many reasons. The products he's helping make have an important purpose: L-3 Insight Technology develops and produces advanced night-vision and electro-optical technology and systems for the United States military. Aaron says, "I know that what I do as laser technician contributes to keeping the men and women of the U.S. military safe, which ultimately protects everyone in the country. That, to me, is gratifying in itself." He also enjoys the challenging nature of the work. "There is always something new to learn, change, fix, or make better," he says. "I find it very rewarding to be able to discuss intricacies discovered during product- and process-improvement testing with engineers and then implement changes in production and products."

Today, Aaron is taking courses in Electronic Engineering Technology while continuing to work as a laser technician at L-3 Insight Technologies. He expects this additional education to offer him even greater success in his field. Electronics, he says, "goes along with photonics, hand-in-hand—you need electronics to run lasers. Continuing my education is crucial to my success in working in the field of photonics." Aaron has definitely settled into his career as a laser technician, as well as working in New Hampshire. "I like where I'm at," he says. "This part of the country is beautiful! I just bought a condo and see myself building my career here."

*Aaron earned an associate of applied science degree in laser and optics technology from Indian Hills Community College in 2012. He enjoys playing the guitar, skiing, running, exercising, cooking and spending time with friends and family.*

