

Corning Foundation invests \$500,000 in MCC Optics Program

Over the next five years, Corning Incorporated Foundation will provide a \$500,000 grant to Monroe Community College (MCC) as it builds its optical systems technology degree and certificate programs.

MCC, which established its optics degree program in 1971, plans to upgrade equipment in its optics labs and bolster the curriculum to keep pace with current needs in the manufacturing sector. It also plans a comprehensive awareness campaign to encourage more students to consider a career path in optics. Scholarships for students pursuing a degree in Optics are also available.

"The Foundation grant reinforces the core importance of career technical education in our region, particularly with respect to the optics industry that has been a foundation of the Rochester economy for over a century," said Damon Diehl, assistant professor of engineering technologies at MCC. "This funding will support MCC's outreach to regional high schools, and it will allow us to update laboratory equipment so that

our graduates exit the program with hands-on skills that are immediately relevant in industry."

MCC offers summer optics camps for students in Monroe County and job-readiness programs for students in the Greater Rochester region to help them gain an appreciation for career opportunities in optics. Rochester companies such as Sydor Optics, Optimax Systems and Advanced Glass Industries are owned and operated by graduates of the MCC program.

<http://www.monroecc.edu/go/optics>

RIT Lecture Series: "Photons After Dark"

The School of Physics and Astronomy at the Rochester Institute of Technology has started a lecture series entitled *Photons After Dark*, with monthly seminars on topics of interest to the local optics community.

All are welcome; attendance is free. For more information or to suggest prospective speakers, please contact Mishkat Bhattacharya at [mb6154\(at\)gmail.com](mailto:mb6154(at)gmail.com).

<http://www.rit.edu/cos/optics-rit>

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The purpose of the Rochester Section of the Optical Society of America is to promote and disseminate knowledge of optics and closely related sciences in both its local community and throughout the world by (i) bringing together scientists, engineers, business leaders, educators and students, (ii) providing professionals and students with educational resources for the purpose of improving and developing their abilities, (iii) encouraging the sharing of knowledge and innovation, and (iv) encouraging students to study optics and other sciences.

Upcoming Events

◇ OSA Vision Meeting ◇

The University of Rochester's Center for Visual Science is hosting the 2012 Fall Vision Meeting, September 14th through 16th.



www.cvs.rochester.edu/fvm_2012

◇ OSA Annual Meeting ◇

In October, the Optical Society of America is holding its 96th annual meeting, *Frontiers in Optics*, at the Rochester Riverside Convention Center. The meeting will be held concurrently with the American Physical Society's Division of Laser Science meeting, Laser Science XXVIII. The technical program will focus on eight themes:

- Optical Design, Fabrication & Instrumentation
- Optical Sciences
- Optics in Biology & Medicine
- Optics in Information Science
- Fiber Optics & Optical Communication
- Integrated Optics
- Quantum Electronics
- Vision & Color

Several short courses will be offered, and dozens of optics companies will exhibit.

www.frontiersinoptics.com

Mari de Wit is taking a well-deserved break this summer ... his Past President column will resume in September.

\$25,000 Award from OSA Foundation for Optics Suitcases

The OSA Foundation has awarded a grant of \$25,000 to the Rochester Section of the Optical Society of America for the manufacture of one hundred Optics Suitcases.

A proposal was brought before the Foundation by Grace Klonoski, OSA Chief Strategy Officer and Deputy Executive Director, who stated that the *Optics Suitcase*, whose guide has been translated by OSA into four languages (German, Spanish, Portuguese and simplified Chinese), is one of the foremost start-up outreach kits requested by newly formed OSA Student Chapters. Due to recently improved efficiencies in the manufacture and distribution chain that she described, Grace convinced the Foundation to award the grant for the time period between June and December 2012.

A 100 *Suitcase* application backlog in 2011 prompted Grace and Gale Mamatova, OSA Manager of Education and Member Services, to work with the Rochester Section to streamline the *Suitcase* assembly process. Grace and Gale pushed through a bulk purchase of polarizers, liquid crystal sheets, flashlights and laminated copies of the *Suitcase* Guide and the Periodic Table of the Elements. Once these supplies were delivered to the Rochester Section, Education Committee Chair Steve Jacobs and Outreach Coordinator Terri Donlon were able to increase *Suitcase* production to twelve units per month.

Bruning Receives Zernike Award

John Bruning, retired president and CEO of Corning Tropol Corporation in Fairport and past president and honorary member of the Rochester Section of the OSA, has been awarded the 2012 Frits Zernike Award for Micro-lithography by SPIE in recognition of his "vision and its realization in deep-uv excimer projection lithography, phase-measuring interferometry, die-to-die mask inspection, as well as executive contribution in world-leadership production of specialty precision optical systems and specialized metrology instrumentation for the microelectronics, automotive, and optics industries."

Speaker Exchange with the Optical Society of Southern California

The Rochester Section and the Optical Society of Southern California (OSSC) have entered into a cooperative agreement to exchange speakers during the 2012-13 season. Our members who are traveling to southern California and who may wish to present to the OSSC are welcome to contact Alex Small of California State Polytechnic University, at [arsmall\(at\)csupomona.edu](mailto:arsmall(at)csupomona.edu).

OSSC members who are traveling to our area are likewise invited to contact our Program Chairs, Mari de Wit of QED Technologies and Dan Staloff of Corning, to arrange a talk with our membership. Any members in the area are also invited to attend the chapter's meetings.

Summer Sizzler

Introducing High School Students to Optics

In late June, a group of Rochester-area optics manufacturers, the Rochester Regional Photonics Cluster (RRPC), MCC and two local high schools held a summer camp, the Summer Optics Sizzler, to introduce high school students to optics and encourage them to pursue a career in optics.

Thirty students from East High School and Gates-Chili High School worked with industry and academic volunteers during a four-day camp, investigating a number of topics, including projection science, Snell's Law, spectroscopy, interferometry and stereo vision.

"We've had such strong support and success with the Summer Sizzler camp to date – now we're working to scale it. Communities around the country are interested in following our model."

Tom Battley, RRPC
executive director and
camp organizer

After completing the camp, the students were invited to apply for summer internships at participating optics companies.

Do you have news of interest to the OSA-RS membership?

Contact Chris Palmer at [chris.palmer\(at\)newport.com](mailto:chris.palmer(at)newport.com)

Educational Activities

Spotlight on Ghana

Dan Williams, a UR Optics graduate student, sent an update on his June trip to Ghana with other students participating in the National Science Foundation's Integrative Graduate Education and Research Traineeship (IGERT):

"The optics suitcase we brought along was extremely useful! We taught over 200 children grades 4 through 8 during our trip by reusing the materials. Most of the classes we taught were at Chirapatre Primary School in Kumasi, Ghana. We also taught briefly at the much more upscale school called SOS Ghana, also in Kumasi.

"We modified the workshop to better suit the situation and our purpose for going to Ghana (solar energy). We left out the Silicon vs. Silica demo since even the teachers at the Chirapatre school didn't work

with the periodic table. We also left out the explanation of what polarization means during the polariscope demo. We just used the polariscopes as a tool to see the colors in white light. In the interest of time and the 100 degree ambient temperatures, we left out the LC sheet demo.

"Some things we added were outdoor demos to show that there is energy in sunlight. We burnt a piece of paper using sunlight and the silica lens from the suitcase, we added a little solar powered toy car, and we had a small solar panel connected to a fan. We would let the kids cast a shadow on the solar panels to cause the car and fan to stop moving. I think the most effective demo was the heat pack followed closely by the happy/unhappy balls and the solar powered toys."

Including Ghana, Optics Suitcases are now in use in fifty-four (54) countries and thirty-four (34) US states.



Students at the Chirapatre Primary School in Kumasi, Ghana, looking through the Rainbow Peephole.

National Student Solar Spectrograph Competition

May 15-18, 2013
Bozeman, Montana

The annual *National Student Solar Spectrograph Competition* (NSSSC) is the Montana Space Grant Consortium's (MSGC) Education and Public Outreach (EP/O) Program for NASA's Interface Region Imaging Spectrograph (IRIS) mission.

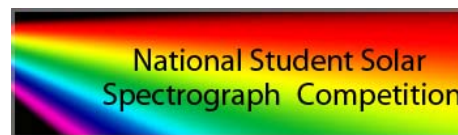
The NSSSC is designed to give undergraduate college and university students the opportunity to work as part of an interdisciplinary team to design, build and test a ground-based solar spectrograph.

A spectrograph is an instrument used to measure the properties of light over a specific portion of the electromagnetic spectrum by separating the incoming light into its spectrum (i.e., its characteristic frequencies or wavelengths).

"NASA is in a unique position to use scientific space missions like IRIS to foster student interest in science and engineering," said Diane DeTroye, of NASA's education office in Washington, D.C. "Giving students a chance to get hands-on experience often encourages them to pursue and continue STEM [science, technology, engineering, and mathematics] studies. This helps build an important pipeline of talent for future NASA missions."

The goal of this competition is to design and build a spectrograph and carry out a

ground-based spectroscopy experiment of the students choosing. Each team has the 2012-13 academic year to declare a science goal, design and build their instrument, collect and analyze data, and perform some type of educational outreach. Teams then travel to Montana to demonstrate their instrument and their findings in a competition-style format.



Undergraduate students interested in designing a spectrograph may now register for next year's competition.

Build awards of \$2,000 per team are available for teams that register by September 30th, 2012.

More information is available at <http://www.spacegrant.montana.edu/iris/>.

"This is a marvelous opportunity for young people to develop high-level skills in instrument building. Using the instrument to answer science questions makes it even better", said Edmond Wilson, a professor at Harding University and advisor to one of last year's teams.

The 2012-2013 competition dates are **May 15-18, 2013** in Bozeman, Montana. For more information, please contact Randy Larimer of the MSGC at rlarimer@ece.montana.edu or (406) 994-6085.



Students from San Diego State University aligning their spectrograph to a heliostat on the roof of the physics building at Montana State University, Bozeman in May, 2012.

Interview

Damon Diehl, MCC

In January, Damon Diehl, president-elect of the Rochester Section of the OSA, was named assistant professor and program coordinator of the Optical Systems Technology program at Monroe Community College in January.

OSA-RS: Congratulations on being appointed to the engineering technologies faculty at MCC and as the head of the optics technology program. Would you tell us a little about your background, please, and why this position interests you?

Damon: I studied physics and math at the University of Chicago, and I moved to Rochester in 1995 to study optics, where I joined Nicholas George's Electronic Imaging Systems research group. I had been making holograms since I was a teenager, and Nick George is a world-renowned pioneer in holography, so working in his labs was just wonderful — great lasers, terrific labs, and all sorts of legacy equipment. Nick loves teaching undergraduates, and I ended up mentoring three or four undergraduate student projects. I learned a lot about teaching by doing that, but I never considered it as a career.

OSA-RS: What did you do after graduation?

Damon: After I completed my doctorate, I did a short post-doctoral project with my friend

Taco Visser in the Netherlands, then immediately started working in industry for Christopher Cotton as ASE Optic's first scientist in 2004. ASE is traditionally known as a "contract engineering" company, but Chris had realized that he could leverage ASE's successful commercial contract work as a way to get into government contract work via the Small Business Innovative Research (SBIR) program. We were immediately successful, and that led to a string of projects for the Army and Navy related to manufacturing and measuring aspheric optics for defense applications.

That led to partnerships with other companies doing complementary work, and really taught me a lot about the uniquely collaborative tenor of Rochester's advanced manufacturing community.

"It was pretty clear that all eyes were on Rochester to do something."

Damon Diehl

Parallel to SBIR work, ASE's commercial contracting continued to grow, and by 2010 Chris was fielding offers to sell ASE Optics.

In the end Rochester Precision Optics (RPO) made a winning offer. Although I quite liked the work RPO does, I made the difficult decision not to become a full-time employee at RPO. During the transition, I wrapped up my duties as principal investigator on ASE's SBIR projects while simultaneously starting my own business as a technical consultant specializing in SBIR proposals. I also found myself supporting research proposals

out of the Rochester Institute of Technology (RIT), and in a roundabout way, that led to my meeting Todd Oldham, the new Vice President of Workforce Development at Monroe Community College (MCC) by way of Tom Battley at the Rochester Regional Photonics Cluster (RRPC).

Todd and I really "clicked" because of our shared interest in addressing a growing "talent gap" in advanced manufacturing. In Rochester, this gap is most clear in the optics industry, due to a lack of skilled technicians. Part of the problem was that MCC's Optical Systems Technology program had been allowed to founder when the senior faculty retired, and Todd was pushing to revitalize the program. I brought him on to speak to the Rochester Section of OSA, and he drew an enormous crowd, with people traveling from as far away as Pennsylvania to discuss the national shortage of optics talent and what we were doing to address it. It was pretty clear

that all eyes were on Rochester to *do something*. I started getting more and more involved in helping to find someone to lead the optics program at MCC, and I also started getting involved with the high school programs that RRPC had been spearheading.

Ironically, it never occurred to me to apply for the MCC job myself until Jessica Nelson at Optimax forwarded to me the same job posting that I was sending out to my own colleagues. Getting that email from Jessica felt like one of those absurd moments when you've been tearing your

house apart looking for your eyeglasses only to have someone point out that your eyeglasses are sitting on your head. I needed someone else's external perspective. From there, things proceeded rapidly. I applied for the job, interviewed for it in December, accepted it in January, and started teaching a few weeks later. It felt like a puzzle piece dropping into place.

OSA-RS: What are the primary challenges you face in your new position at MCC?

Damon: My core responsibilities are teaching and coordinating the program, and the big challenge is that I essentially have two full-time jobs. Developing curricula, lecturing, advising students, and grading takes about 45 hours of my time every week, and that's with the support of some pretty amazing adjuncts.

On top of that, I spend at least 10 to 15 hours every week coordinating the program, which is basically a matter of focusing the energy being directed at reigniting the program.

It's like I volunteered to be a lighting rod ... or if you want to use an optics example, it's like being at the center of the target chamber at the UR Laboratory for Laser Energetics. The MCC administration, the local high schools, and regional businesses are all firing about a petawatt of power at the MCC Optics program from all directions, and it's my job to hold the target steady.

OSA-RS: Tell us about the students: where do they come

from, what are they doing at MCC, and where are they going?

Damon: Broadly speaking, the program is built to serve three different types of students.

The first is full-time undergraduates, mostly fresh out of high school. These students usually pursue the Associates degree. Traditionally about half use it as a spring board to a Bachelors degree. The ones who go

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immediately to work often end up with jobs in the industry before they even graduate.

That leads us to the second group — people who already work in the optics industry but are seeking additional training. These students are usually part-time and either don't matriculate at all or just get a certificate. Most often they are seeking to move into a new position at the company where they already work. Often they're also on the lookout for new hires and end up "sniping" non-employed students before they are even officially on the market.

The last group is people seeking a career change into the optics industry. A lot of them are displaced workers trying to get an edge in a difficult economy. They come from all sorts of backgrounds — last year I was seeing a lot of quality control people, and this year I'm seeing a lot of machinists and production

engineers. They tend to be a bit older, and that can be a bit of a hard sell to employers, which is unfortunate. For one thing, they inevitably have a richer background to draw on, but most importantly, we're already dealing with one "baby boom" induced spike in the employment age demographics. If we only replace retirees with twenty-somethings, then the industry will face another "boom" problem in 30 years. I don't want to have to do this all over again when I'm 70!

OSA-RS: The multiyear grant from the Corning Foundation is big news – how do you foresee this grant helping to shape the optics technology program?

Damon: The grant reinforces the core importance of career technical education in our region, particularly with respect to the optics industry that has been a foundation of the Rochester economy for over a century. This funding will support MCC's outreach to regional high schools, and it will allow us to update laboratory equipment so that our graduates exit the program with hands-on skills that are immediately relevant in industry.

For more information on MCC's optical systems technology programs, please contact Damon at (585) 292-2675 or [ddiehl4\(at\)monroecc.edu](mailto:ddiehl4(at)monroecc.edu).