



## OSA Rochester Section Newsletter

### Glass Art Contest and Auction, hosted by OSA Rochester Section, to be Held at FiO/LS in October

A Glass Art Contest & Auction, hosted by OSA Rochester Section, is to be held at FiO/LS at the Rochester Riverside Convention Center, Empire Hall. Exhibit hours will be Wednesday, 19 October, 9:30 am - 4:00 pm and Thursday, 20 October

9:30 am - 2:00 pm Worldwide optical fabricators and glass artists have been invited to showcase their unique approaches to the design and manufacturing of glass artwork. All pieces will be displayed in the Frontiers in Optics Exhibition Hall, 19 – 20 Octo-

ber, in a silent auction open to all attendees. Proceeds will go to OSA-RS to support The Optics Suitcase and The OSA Foundation to support Explore Optics Kit.

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### Optimax Precision Optics Manufacturing Technician Apprenticeship *By Jim VanKouwenberg*

In response to the Obama administration's "Upskilling America" initiative, Optimax submitted an occupation description for an "Optics Manufacturing Technician" to the USDOL Employment and Training Administration.

This was the first step toward creating a registered apprenticeship. The description is based on The National Precision Optics Skill Standards for Technicians created by Op-Tec with input from subject matter experts and reviewed and edited by industry pro-

fessionals.

The standards received endorsement from APOMA, Colorado Photonics Industry Association, Florida Photonics Cluster,

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### OSA Rochester Section 2016-2017 Council

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Program Co-chair	David Compertore (Lumetrics)		

The Optical Society  
Rochester section  
Founded in 1916

#### Highlights:

- > Glass Art Contest and Auction to be Held at OSA FiO/LS
- > OSA Rochester Section 2016-2017 Speaker Series Update
- > In memoriam: Dr. Erwin Loewen, OSA Fellow
- > Optimax Precision Optics Manufacturing Technician Apprenticeship



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## OSA Rochester Section 2016-2017 Speaker Series: A Mathematician’s Perspective of the Mechanics of a Contact Lens

The first installment of the OSA Rochester Section 2016-2017 Speaker Series featured a talk by Professor Kara L. Maki, entitled:

*“A Mathematician’s Perspective of the Mechanics of a Contact Lens.”*

The talk was given on Sept. 20, 7PM, at the University of Rochester Laboratory for Laser Energetics.

**Abstract:** In this work, we aim to better understand how the design of contact lenses can be optimized for patient comfort and ocular fit. To do so, we present a new approach to computing the suction pressure under a soft contact lens.

When a contact lens is placed on an eye, it is subjected to forces from both the tear film in which it is immersed and the blinking eyelid. In response, the lens bends and stretches. These forces center the lens, and they produce the suction pressure that keeps the lens on the cornea.

We couple fluid and solid mechanics to determine the most prominent forces acting on the lens. We find that the

important mechanical property of the contact lens for producing suction pressure is stretching, i.e., elastic tension. We assume the contact lens must conform to the shape of the eye. This perspective allows us to derive a terse system of ordinary differential equations, through an energy argument, to determine the suction pressure under the contact lens.

We solve this system numerically for various eye shapes and contact lens shapes. The system of ordinary differential equations



Kara L. Maki, Assistant Professor, School of Mathematical Sciences, Rochester Institute of Technology (Photo Credit: K. Maki)

captures the basic physics and the elastic tension need-

ed to begin to understand a “working” contact lens. Thus, we can begin to create “rules of thumb” for contact lens design.

Dr. Kara L. Maki received her Ph.D. in Applied Mathematics from the University of Delaware in 2009.

Before arriving at RIT in 2011, she completed a two-year postdoctoral experience at the Institute for Mathematics and its Applications at the University of Minnesota. Her research focuses on developing mathematical models to understand the tear film dynamics, contact lens mechanics, and droplet dynamics.

We very much thank Prof. Maki for her participation in the Speaker Series, and for her contributions to the field of optics.

### **A note about the OSA Rochester Section 2016-2017 Speaker Series:**

Updates on future talk topics and dates will be posted on the OSA Rochester Section Facebook and LinkedIn pages. Please consider liking/joining both groups for the most current information regarding scheduling and topic information!

**“The system of ordinary differential equations captures the basic physics and the elastic tension needed to begin to understand a ‘working’ contact lens. Thus, we can begin to create ‘rules of thumb’ for contact lens design.”**

**-Prof. Maki**

### Past and upcoming talks



Date	Speaker	Title or topic
Sep 20	Kara L. Maki (RIT)	A Mathematician’s Perspective of the Mechanics of a Contact Lens
Oct 4	Brian Kruschwitz (LLE)	The OMEGA EP Laser System: Recent Developments and Prospects
Nov 1	Steve Fentress (RMSC)	Planetarium Optical History
Nov 15	Stefan Preble (RIT)	Integrated Photonics
Dec 6	Thomas Brown (UR)	The Strange World of Polarized Light

## In Memoriam — Dr. Erwin G. Loewen, OSA Fellow, B + L Innovator, Former OSA-RS President

Dr Erwin G Loewen, an OSA fellow and expert on diffraction gratings, died on June 8th in Rochester, New York, aged 95 years.

Born in Germany, Loewen moved to England and then the United States. In 1941 he received a BMechE degree from New York University. After serving in the Unit-



Dr. Loewen (Photo Credit: ASPE)

ed States Army, he enrolled at the Massachusetts Institute of Technology, where he received MS, MMEchE and DSc degrees.

Loewen served as the director of Bausch + Lomb's Grating Laboratory (now Richardson Gratings) for more than twenty-five years where he specialized in the design and manufacture of diffraction gratings, and retired in 1987 as vice president of research and development at Milton Roy. He then taught in the University of Rochester's Institute of Optics until 1997.

Loewen coauthored Diffraction Gratings and Applications and dozens of articles on gratings and metrology.

He was honored with the Society of Manufacturing Engineer's F. W. Taylor Re-

search Medal, the OSA's Richardson Medal and Joseph Fraunhofer Award / Robert M. Burley Prize, the Lifetime Achievement Award from the American Society for Precision Engineering, the Rochester Engineer of the Year award, and the Technology Award from the Rochester Chamber of Commerce.

He also served as president of the Rochester Section of the Optical Society of America and two terms on an advisory panel for the National Bureau of Standards.

Erwin's passion for extending the research and development of diffraction gratings beyond existing limitations led to a more than thirty-year-long and quite fruitful collaboration.

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## “The President’s Lens”



Hello Everyone,

It's with great pleasure that I write to you for the first time for the 2016-2017 year. As I mentioned at the Annual Dinner this past May, we've assembled a very capable, passionate team. There are many exciting opportunities ahead of us in support of the mission of the Rochester Section.

For example, the Optics Suitcase program is growing and we are ardently working to help develop a streamlined, automated process for fulfillment of orders for it. Much of this is now in place, thanks to the tremendous support of both the previous and current Councils.

Also, we are hard at work with OSA National to help with administration and support of the Glass Art Contest and Auction at Frontiers in Optics (FiO/LS 2016). We are so very proud to have an opportunity to be hosts of this event, which coincides with OSA's 100th anniversary.

We will be announcing annual scholarship winners in the springtime, and are currently assembling an exciting schedule of speakers for the academic year as well.

This is clearly a very exciting time. With the even greater interest we've seen recently in optics and photonics in our community, no doubt, it's a unique occasion for us to

leverage this interest to further our mission.

We look forward to sharing with you all of the good work we'll be involved in this year!

Kind regards,

Jason Rama  
President  
OSA Rochester Section

## Leaders in the Field of Optics and Photonics Research and Industry to Convene at The Optical Society FiO/LS Meeting

*From OSA National Newswire*

### FiO highlight

**“The FiO 2016 Symposium will be held on October 17 – 21 at the Rochester Riverside Convention Center, Rochester, New York, United States.”**

As we look forward to the next 100 years of innovation, Frontiers in Optics returns to Rochester, the birthplace of The Optical Society.

#### **FiO 2016 —t he 100th OSA Annual Meeting —**

encompasses the breadth of optical science and engineering and provides an atmosphere that fosters the exchange of information between those working on fundamental research and those looking for solutions to engineering problems.

Special symposia and other major events further highlight major advances in many selected areas.

The FiO 2016 Symposium will be held on October 17 – 21 at the Rochester Riverside Convention Center, Rochester, New York, United States.

Special Events to Include:

#### **Science Educators Day (EDAY) 2016**

Sunday, 16 October, 13:30 - 16:30

Join us in Rochester, NY for a free lunch and learn workshop hosted by The Optical Society Foundation (OSAF) in partnership with the American Association of Physics Teachers (AAPT) and The Optical Society (OSA) Rochester Local Section for K-12 educators!

This program will focus on light and color through fun, hands-on, and even \*edible\* science experiences. Participants will engage with a variety of take-home items for demonstration with their students.

#### **Women of Light, a Special Program for Women in Optics hosted by WiSTEE CONNECT**

Monday, 17 October, 11:00 - 17:00

WiSTEE Connect is an organization which serves to connect female students, faculty members, and engineers in Science, Technology, Engineering, and Entrepreneurship (STEE) from regional universities and private companies in upstate New York. The vision of WiSTEE Connect is to promote women leadership in STEE and assist women involved in these areas to gain regional and/or global connections and recognition. This organization helps to bridge the gap between science and entrepreneurship while providing a forum through which women in these fields may learn, connect, and lead.

The overall goal of the “Women of Light” special session is to shine light upon women’s careers in science, technology, engineering, mathematics, and entrepreneurship, recruit women across career ranks and disciplines, and build a sustainable community of women in both academia and industry from which career growth, mobility, and leadership opportunities may be sought out.

#### **Photonics Clambake 2016**

Tuesday, 18 October, 17:30 - 20:30

The Photonics Clambake is a melting pot of optics & photonics professionals who gather to enjoy one of the industry’s premier networking

events while relaxing with refreshing beverages, great food and did I mention DELICIOUS clams.

What Your Ticket Includes: Four dozen steamed clams plus dinner buffet including: BBQ chicken, pasta, salt potatoes, corn on the cob and salad. Three hours of open bar to include wine beer and liquor.

#### **Optics Alumni Networking Reception**

Tuesday, 18 October, 19:00 - 22:00

The Institute of Optics, University of Rochester; The College of Optical Sciences, University of Arizona; The College of Optics & Photonics, University of Central Florida; and Stanford Photonics Research Center, Stanford University, are honored to host our alumni and invited friends for a reception in conjunction with OSA FiO. Remarks from Optics Leaders will be featured at 20:00, including Xi-Cheng Zhang, Thomas Koch, Bahaa Saleh and Thomas Baer.

#### **AIM Photonics Northeast Supply Conference (NESCO)**

Wednesday, 19 October, 08:00 - 17:00

The AIM Photonics Northeast Supply Conference (NESCO) provides a stage for established Photonics supply chain companies, new and emerging innovators, industry leaders, strategic investors, and venture capitalists to discuss the needs and requirements of the industry’s future growth. Participants will gain insights

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# Optimax Precision Optics Manufacturing Technician Apprenticeship *By Jim VanKouwenberg*

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New Mexico Optics Industry Association, and the Rochester Regional Photonics Cluster. Based on these endorsements, we hope for widespread industry acceptance of the occupa-

ping, quality, coating and assembly operations. Rotation periods range from two weeks in sales, to 10 – 12 weeks in each of the manufacturing areas. In each segment of the rotation, the apprentice will receive 1 – to – 1 OJT with experienced

apply for the program online through our payroll services provider. Candidates are required to pass Work Keys testing in reading and math at a level appropriate for successful completion of the MCC courses. They also go through an interview process to determine their interest and commitment to the program. At this time we have two apprentices that have begun their rotation and class work.

The occupation description and apprenticeship outline were intended to be flexible enough to accommodate the differences in manufacturing practices from one company to another. By doing this, we hope to interest other precision optics manufacturers in starting apprenticeship programs, and possibly establishing a nationally recognized credential.

[Photo Credits: J. VanKouwenberg]



tion description and the apprenticeship outline.

On March 2nd, 2016 we received a letter from the Office of Apprenticeship, recognizing Optics Manufacturing Technician as an apprenticeable occupation.

Working with the New York State DOL, we prepared an apprenticeship outline for submission. This describes the workplace training outcomes, and related instruction. The trade was presented at the July meeting of the NYS Apprenticeship and Training Council, and in August, was approved as apprenticeable by the Commissioner of Labor.

The program is a three year rotation, including On the Job Training (OJT) in all aspects of the company, from sales to shipping. The vast majority of the OJT will focus on the manufacturing operations, but apprentices will also be introduced to the sales, supply chain, ship-

menticians, and perform as a regular team member to gain hands on experience. Related instruction will include Safety/Health/Environmental topics, as well as credit bearing courses. Most of the instruction will be applicable to the AAS degree in Optical Systems Technology from MCC.

We are starting new apprentices at three month intervals. They are chosen from incumbent employees who



## Industry connection

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## 2016 Annual Dinner Held in May

### Guest Speaker: Peter Hallett, SPIE

2016 is an important year as it marks the 100th anniversary of the OSA. This past May, our Annual Dinner was held — both to hold our annual business meeting, and to celebrate!

The OSA Rochester Section was honored to have Star Trek enthusiast Peter Hallett as a guest speaker at the 2016 annual dinner. He discussed the many photonics-enabled ideas and props from the original Star Trek show that visionary scientists and engineers have recently turned into reality.

Some examples of modern technologies that appeared in the original Star Trek series prior to their actual invention include 3D printers, mobile phones, tablet PCs, remote spectrometers, flat screen displays, and lasers as both weapons and medical devices. Recent advancements in photonics research suggest that more Star Trek based technologies will be developed in the near future including invisibility cloaking through metamaterials, teleportation through quantum entanglement, and tractor beams based on optical tweezers.

We were also very honored to have the membership in attendance for the holding of our Annual Meeting, which was called to order by 2015-2016 President Jessica Nelson. We had a year filled with many talented speakers, who graciously shared their fields of study with the greater community.

We also updated on the progress and status of shipping Optics Suitcases worldwide, which is now being transitioned to an automated process so that we can take on even greater interest for OSA Rochester's educational support and outreach in the coming years!

We announced a newly-commissioned "Stephen Jacobs Memorial Lecture" for the purpose of funding an effort to bring one speaker per year to talk at the OSA Rochester Section 2016-2017 Speaker Series on a topic closely aligned with the research topics of particular interest to the late Prof. Jacobs.

We are already beginning work on preliminary plans for the 2017 Annual Dinner, to be held in May 2017. We welcome any feedback or suggestions you may have; please contact [house@osarochester.org](mailto:house@osarochester.org) with any questions and/or inquiries.

**“We announced a newly-commissioned ‘Stephen Jacobs Memorial Lecture’ for the purpose of funding an effort to bring one speaker per year to talk at the OSA Rochester Section 2016-2017 Speaker Series on a topic closely aligned with the research topics of particular interest to the late Prof. Jacobs.”**



Star Trek cake in keeping with the Annual Dinner theme.



2015-2016 OSA Rochester Section President Jessica Nelson, conducting the Annual Business Meeting

### In Memoriam — Dr. Erwin G. Loewen, OSA Fellow, B + L Innovator, former OSA-RS President

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oration with several research teams in France (Laboratoire d'Optique Electromagnétique and Institut Fresnel in Marseille), England (Cranfield Institute of Technology), Australia (University of Sydney) and Bulgaria (Institute of Solid State Physics in Sofia). His practical sense perfectly matched his own phrasing: "One thing is to publish a scientific paper, another is to make a product, and completely different is to sell it profitably."

Erwin's wide experience in optics led to the realization

of many scientific projects and to many scientific papers, bringing together scientists and optical engineers. Erwin conducted himself with elegance, a sense of humor, natural dignity, and a lot of curiosity, kindness, and compassion. He loved life and was always eager to discover new countries and people, to enjoy new cuisines, especially in the south of France, and to savor fine wines.

He is survived by daughter Heidi Loewen and son Oliver Loewen (by his first wife Joanna), three grandchildren and his second wife Anita

Rosenfeld. A memorial service was held in Rochester on August 6th.

Christopher Palmer  
Richardson Gratings  
Rochester, New York

Evgeny Popov  
Laboratoire d'Optique Electro-  
magnétique  
Marseille, France

Daniel Maystre  
Institut Fresnel  
Marseille, France

Michel Nevière  
Institut Fresnel  
Marseille, France

**"One thing is to publish a scientific paper, another is to make a product, and completely different is to sell it profitably."**

**-Dr. Loewen**

### Glass Art Contest and Auction, hosted by OSA Rochester Section, to be Held at FiO/LS in October

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This past summer, glass artists were invited to create and enter an original piece in the contest. Awards will be given in multiple categories.

It has been several years since such an event has been held. As the last Contest and Auction were both

extremely successful, and interesting as well, we are all eager to see the unique artistic contributions to be made. Remember to bid early and bid often!

[Photo: Eugene Kowaluk]  
Neodymium Fireball, created by Alex Maltsev, Master Optician and Optical Fabricator



**"Having outsourced the kit assembly to a local contractor, we will be able to leverage their capabilities for optimization of component procurement, and quick, accurate deployment of suitcase kits."**

### Optics Suitcase Production and Distribution Update

During the past year, the Rochester Section Council members — along with industry partners — have been hard at work developing an automated system for assembly of optics suitcase kits.

After some planning, we are pleased to announce that the first kits have shipped in the early fall, to local educators who plan to use the kits in their educational plans for the upcoming year.

Having outsourced the kit assembly to a local contractor, we will be able to leverage their capabilities for optimization of component procurement, and quick, accurate deployment of case kits.

Manual assembly of a handful of kits is not a lengthy endeavor, but since out plans are to take on larger orders, we expect that this will afford us a much greater opportunity to have an impact that is even more sub-

stantially widespread. We will eagerly keep you posted on progress and developments of our automation efforts. We hope, very soon, to be producing kits by the dozens, using our outsourced vendor, this fall!

## Leaders in the Field of Optics and Photonics Research and Industry to Convene at The Optical

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into technology, capital, partnership, and collaboration strategies necessary for mutual success.

Who should attend?  
Entrepreneurs involved or interested in Photonics innovation.

Emerging Optics and Photonics companies seeking to network with technology partners and investors  
Investment professionals from the angel, venture, corporate and institutional communities, R&D, purchasing, supply chain managers, and manufacturing senior executives from the Photonics industry are all invited to attend.

### OSA Annual Business Meeting

Wednesday, 19 October,  
17:00 - 17:45

Learn more about OSA and join the OSA Board of Directors for the Society's annual business meeting. An update on the Society's 2015 activities will be presented and the results of the Board of Directors election will be announced.

### OSA 100 Year BASH

Wednesday, 19 October,  
18:30 - 21:30

In celebration of the OSA Centennial, join OSA in acknowledging the innovators and inventions that inspire the future. This reception is sure to be a high point in a year of celebration. We've waited a century for this, and we want you to be a part of it!

### OSA Light the Future



Prof. Michio Kaku, futurist and theoretical physicist, CCNY  
(Photo Credit: OSA)

### Speaker Series featuring Michio Kaku

Thursday, 20 October, 11:00  
- 12:30

This event will feature Michio Kaku, futurist and theoretical physicist, City College of New York, with Sir Peter L. Knight, emeritus professor, Imperial College, London, OSA Fellow, 2004 President.

Join OSA as we celebrate our 100th anniversary with Light The Future speaker and science advocate Michio Kaku. Imagine self-driving cars, 3D printing and a billion pixel camera. One hundred years ago these inventions were unthinkable.

Yet today, researchers and industry leaders around the globe are perfecting such innovations that once were the realm of science fiction. Dr. Kaku will share his vision of what discoveries lie ahead.

### VIP Industry Leaders Networking Event: Connecting Corporate Executives, Young Professionals &

### Students

Thursday, 20 October, 12:30  
- 14:00

This session brings together Industry Executives to share their business experience with Young Professionals, Recent Graduates and Students – how they started their careers, lessons learned and using their degree in an executive position. Informal networking during lunch is followed by a transition to “speed meetings” – brief, small-group visits with each executive to discuss industry trends or career topics.

For more information on any of the above special events at FiO, and more, please go to the following link: <http://www.frontiersinoptics.com/home/special-events/>

**“Join OSA as we celebrate our 100th anniversary with Light The Future speaker and science advocate Michio Kaku. Imagine self-driving cars, 3D printing and a billion pixel camera. One hundred years ago these inventions were unthinkable.”**

**“In celebration of the OSA Centennial, join OSA in acknowledging the innovators and inventions that inspire the future. This [OSA 100 Year Bash] reception is sure to be a high point in a year of celebration. We've waited a century for this, and we want you to be a part of it!”**

## About OSA Rochester Section

Find us at  
[osarochester.org](http://osarochester.org)

The purpose of the Rochester Section of the Optical Society 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.

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### Contact us:

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