INDUSTRY EVENTS

Business Perspectives That Help You Grow.

These events and sessions will provide valuable information and networking for anyone, from engineers to CEOs, looking for business insight and opportunities.
Make time for the largest and most diverse business program ever: with over 30 events, there is something for everyone, from researchers and engineers to CEOs, from startups to multinational corporations. These important events and sessions provide valuable information and networking opportunities to help you grow your business.

### PANELS, KEYNOTES, AND SPECIAL EVENTS

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### WORKSHOPS, COURSES, WORKING GROUPS

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Protecting and Fostering Intellectual Property Rights in a Global Economy

Monday 30 January • 1:00 to 2:00 pm
Location: South Exhibit Level, Room 103

How safe is your intellectual property? From geopolitical changes to patent infringements, hear what is working and some predictions for the future from John Cabeca, Director of the Silicon Valley USPTO, which also has a set of programs and resources tailored to the unique needs of the startup community.

This session will look at trends in IP and what companies are doing in these photonics-rich areas:
- Augmented Reality / Virtual reality
- 3D cameras / cameras for phones
- Autonomous cars
- 3D printing

KEYNOTE:
John Cabeca
Director of the Silicon Valley
United States Patent and Trademark Office

Q&A MODERATORS:
Curtis Vock
Lathrop & Gage LLP
Stephen Barone
Lathrop & Gage LLP

Nine out of Ten Startups Will Fail: How Four Startups Made It

Monday 30 January • 2:00 to 3:30 pm
Location: South Exhibit Level, Room 103

Nine out of ten startups will fail. Statistics like these are not intended to discourage entrepreneurs but to encourage them to work smarter and learn how to increase their odds of success.

This panel will highlight four startups that have traveled the hard path and made it. Hear about their failures and wins, their biggest challenges and triumphs, and other advice that can help any young or smaller company.

Topics to be discussed: customers, competition, supply chain, finance, staff, and which do you focus on first?

Q&A and networking to follow.

MODERATOR:
Arun Chhabra
8tree, CEO

PANELISTS:
Manuel Aschwanden
Optotune, CEO and Owner
Bernardo Cordovez
Optofluidics, President and Founder
Supriya Jaiswal
Astrileux Corporation, CEO and Founder
Graeme Malcolm
M Squared Lasers, CEO and Founder

INTENDED AUDIENCE: Anyone in a company, starting a company, or planning on starting a company. Individuals from both academia and industry are welcome.
How Startups Can Avoid the Biggest Legal Mistakes: Advice from Leading Law Firms

Monday 30 January • 3:30 to 5:00 pm
Location: South Exhibit Level, Room 103

Entrepreneurs are known for thriving in uncertainty and risks but legal matters should not be taken lightly. It could mean the success or failure of your company. And no one wants to fail because of structural, tax, IP or other avoidable business issues. Hear from experts at leading law firms about the most important legal issues for photonics companies and how to avoid the biggest mistakes.

MODERATOR: Kerry Scarlott
BakerHostetler

PANELISTS:
George Colindres
Perkins Coie

Lana Muranovic
BakerHostetler

Bruce S. Itchkawitz
Knobbe Martens

TOPICS INCLUDE:

• **IP Law:** When startups are in the whirlwind of launching a new product or strategizing a marketing plan, there are crucial intellectual property issues that should not be overlooked. Knobbe Martens Olson & Bear says “there are at least seven things startups should know about IP law”.

• **Export Law:** In June 2016, new rules were issued revising existing definitions and adding new ones in the Export Administration Regulations (EAR) and the International Traffic in Arms Regulations (ITAR). Learn more this and other export issues.

• **Corporate Formation:** Should You Form an Inc. or LLC? Incorporating your business in the early months is essential to protecting your personal assets from any liability of the tech startup. Learn more about what you should and shouldn’t do.

INTENDED AUDIENCE: Anyone at a company, starting a company, or planning on starting a company. Individuals from both academia and industry are welcome.

Q&A and reception to follow. Tables will set up for one-on-one networking with each panelist.

Photonics Cluster Reception

Monday 30 January • 5:00 to 6:30 pm
Location: InterContinental Hotel, Ballroom A

Dress is business attire. RSVP via innovation@spie.org

All leaders from regional optics and photonics clusters are invited to join this SPIE-hosted reception. Connect with colleagues while enjoying drinks and appetizers, compare notes, and hear an update from your peers abroad on efforts to raise awareness of photonics in their region, as well as a brief report on the SPIE Photonics Market Analysis project.
Biophotonics Executive Forum

Tuesday 31 January • 7:00 to 10:00 am
Location: InterContinental Hotel, Ballroom B
Bring a business card if you don’t have time to register

Photonics has become a dominant enabling technology for a multitude of biomedical products. This session will highlight the opportunities and challenges associated with bringing photonics-based technologies to the medical marketplace. From a discussion of the global markets for optics and biophotonics products to key emerging technologies centered on point-of-care sensing and diagnostics, this inaugural event brings together top researchers and industry leaders to discuss the development and commercialization of optics and photonics-based systems that promise to revolutionize the practice of medicine.

PROGRAM:

BREAKFAST AND NETWORKING - 7:00 am
Enjoy a light breakfast while meeting and engaging with the speakers and your peers.

SESSION OVERVIEW
Biophotonics: A New Look at the Global Marketplace

The SPIE industry team continues its efforts to characterize the optics and photonics marketplace. In this presentation the team’s newly updated analysis of the global market for biophotonics is unveiled.

INTRODUCTION:
Stephen G. Anderson
SPIE, Director, Industry Development

PANEL DISCUSSION
Wearables, Wireless, and Biophotonics: Novel Opportunities in Point-of-Care Testing

Connected health solutions using mobile technology combined with biophotonics are transforming health care by enabling novel point-of-care devices and instrumentation. At the same time, these technologies are underpinning convergence of conventional medical instrumentation and consumer devices like smart wearables. This panel will explore the role of these technologies in point-of-care testing and the emerging opportunities for them in personalized medicine and tomorrow’s healthcare system. Q&A and networking to follow.

MODERATOR:
Bruce Tromberg
Beckman Laser Institute and Medical Clinic, Director

PANELISTS:
Gene Dantsker
Qualcomm Life, Director Business Development
Aydogan Ozcan
The Ozcan Research Group and UCLA
Michelle Khine
UC Irvine and Fluxion Biosciences Co-founder
Brad Rice
Profusa, Vice President of Engineering R&D
The Solid State Lighting Revolution: Technologies That Will Shape the Future of Lighting

Tuesday 31 January • 8:15 to 9:45 am
Location: South Exhibit Level, Room 103

The worldwide $80 billion lighting market is undergoing a transformation of a magnitude not seen since the invention of the incandescent lamp. LED technology has reached a level of cost and performance such that nearly all the lighting applications formerly served by conventional light sources (for example incandescent, fluorescent and HID lamps) can now be addressed by LEDs, from flashlights to roadway lights. Although energy efficiency has been the main driver for this transformation, other factors, such as light quality and controllability, are now becoming important.

This panel of experts will provide insights on the technologies that will influence the next wave of the solid-state lighting transformation, from sources to optical systems. Q&A and networking to follow.

MODERATOR:

Robert V. Steele
Strategies Unlimited, Consultant

PANELISTS:

Tigran Galstian
LensVector, CTO and Co-Founder

Mario Paniccia
Versalume, CEO

Mike Krames
ARKESSO, President and Founder

Paul Rudy
SoraaLaser, Sr. VP of Business Development

Photonics West Exhibition

Tuesday 31 January • 10:00 am to 5:00 pm
Location: South ABC and North D Exhibit Halls

Come see the latest devices, components, and systems that are enabling today’s technology trends. With more than 1,300 companies, this exhibition continues to be the flagship event to find the latest products, tools, and applications for your research or business needs.

Job Fair

Tuesday 31 January • 10:00 am to 5:00 pm
Location: South Exhibit Hall

Top employers are coming together to interview and hire candidates at Photonics West 2017

Meet over 30 recruiters on the exhibition floor including Apple, Daylight Solutions, DSI, II-VI, KLA Tencor, Lumentum, Microsoft, ACT, Newport, Rockley, Thorlabs, and more. Whether you are looking for employees or looking for a job, this is your chance to connect with the best.
6 FINALISTS, 5 MINUTES

$10,000

WEDNESDAY
3:30 TO 6PM
CONVENTION CTR.
ROOM 103

SIX PRE-REVENUE PHOTONICS ENTREPRENEURS HAVE 5 MINUTES TO PITCH THEIR BUSINESS IDEAS AND A CHANCE TO WIN OVER $85,000 IN CASH, PRIZES, PROMOTION, AND MORE.

WWW.SPIE.ORG/STARTUP

FOUNDING PARTNER
JENOPTIK

SUPPORTING SPONSORS
TRUMPF, Edmund Optics worldwide, open photonics, NSF
Photonics Fast Pitch Lunch

Tuesday 31 January • 12:00 to 1:30 pm
Invitation only: email innovation@spie.org for information

Join angel investors, VCs, analysts, M&A specialists, and big company scouts at this inaugural industry event showcasing many business investment opportunities in a short time. Savvy entrepreneurs, selected presenters from the SPIE Startup Challenge, and executives associated with the French Tech Hub will make a series of rapid-fire, 90 second business pitches for investment. Teams will be invited based on readiness for accelerated growth. (Rookies need not apply.) Session concludes with time for 1:1 questions and networking with potential investors and mentors.

Teams interested in pitching should email innovation@spie.org by 16 January with 100 words describing the company, problem, solution, and current status.

SPIE FAST PITCH LUNCH SUPPORTED BY:

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Silicon Photonics and Photonic Integrated Circuits: 2017 Industry Perspective

Tuesday 31 January • 1:30 to 2:30 pm
Location: South Exhibit Level, Room 103

Demand for smaller and cheaper optical interconnections inside networks and computers will create a new market of miniaturized, low-cost photonic components that can leverage the scale of CMOS manufacturing. Learn what industry leaders have developed at the frontier of the silicon photonics market. Q&A and networking to follow.

MODERATOR:

Peter Hallett
SPIE, Director of Marketing and Industry Relations

PANELISTS:

Philippe Absil
IMEC, 3D and Optical Technologies Department Director

Peter De Dobbelare
Luxtera, VP of Engineering

Ashok Krishnamoorthy
Oracle, Architect and Chief Technologist, Photonics

Douglas Gill
IBM T. J. Watson Research Center, Research Staff

Yannick Lize
Intel, Silicon Photonics Product Division, Data Center Group
SPIE Startup Challenge Semi-Finals

Tuesday 31 January • 2:00 to 4:00 pm
The Startup Challenge semi-finals are your chance to see young businesses pitch their light-based concept to a team of judges. About 7 teams will pitch in each track with the top 2 in each advancing to the Startup Challenge Finals. This event is open to all attendees.

Track 1: Biophotonics & Point of Care
Location: Park Central Hotel, Franciscan Room I

Track 2: Imaging, Displays, Lasers, & Semiconductors
Location: Park Central Hotel, Franciscan Room II

Track 3: Sensors, Wearables, & IoT
Location: Park Central Hotel, Stanford Room

The Next Big Challenge in Virtual Reality

Tuesday 31 January • 3:00 to 4:30 pm
Reception: 4:30 to 5:30 PM
Location: South Exhibit Level, Room 103

Virtual Reality (VR) and Augmented Reality (AR) are not in the distant future anymore. VR / AR has the potential to become the next big computing platform with revenues hitting the $85 billion mark by 2025 (Goldman Sachs, 2016). However, there are still a few hurdles to get over.

This panel will discuss the main optical challenges that still lay ahead for virtual and augmented reality in the real world. Q&A and networking reception to follow.

MODERATOR:
Leo Baldwin
Amazon, Functional Photonics

PANELISTS:
David Bohn
Microsoft HoloLens, Director of Optical Engineering
Vinay Narayan
HTC VIVE, Executive Director, VR Strategist and Advisor
Scott McEldowney
Oculus, Lead Optics Researcher

Brexit, US Policy, EU and China: Models for Managing through Global Trade Shocks

Tuesday 31 January • 3:30 to 5:00 pm
Location: South Exhibit Level, Room 102

This panel will provide some advice on navigating the tides and storms of shifting international waters. The goal is not to debate or guess at public policy, but to address what should a CEO, board, and senior executives in photonics firms, in various major photonics center locations, be doing over the next 1-2 years to deal with possible impacts. What geographic centers are going to gain strength and what might lose position? What are the possible impacts/threats/opportunities that are coming — and do you take a proactive approach or reactive (it feeds into topics such as employee management, incentives, locations to consider, M&A and investment scenarios).

What’s changing in government R&D and commercial support in key places—and how does a local or foreign firm take advantage of program funding opportunities? How are money flows for investment going to change—for innovation hubs, for where to staff up, for where to get expansion capital from?

MODERATOR:
John Dexheimer
Venture Capital & Private Equity Analyst

PANELISTS:
Charles Comey
Morrison Foerster, Partner
Deepak Kamra
Canaan Partners, General Partner
Bob Flanagan
Raymond James, Managing Director
David Santorum
SPECTARIS, Project Manager Foreign Trade & Export Promotion
Basil Garabet
NKT, CEO Photonics Group
JOE FAIR

LAND THE PERFECT JOB.

VISIT THE JOB FAIR IN THE EXHIBITION HALL

FREE ADMISSION
Tuesday & Wednesday 10 am to 5 pm

See participating companies like these and more.

For more information, visit the SPIE Career Center Booth #1102
3D Printing: New Challenges and Opportunities

Wednesday 1 February • 8:00 to 10:00 am
Location: South Exhibit Level, Room 103

Market analysts valued the global 3D printing market at $2.3B in 2013 and are projecting global revenues of $8.6B by 2020—an impressive compound annual growth rate of more than 20% over seven years! At the same time, Siemens estimates that 3D printing will become 50% less expensive and 400% faster over the next five years.

However, 3D printing can only reach its economic potential and fulfill its promise of revolutionizing manufacturing across multiple industries if a number of significant real-world structural challenges are addressed. Hurdles to widespread implementation of 3D printing include implementation of a proper regulatory framework, provisions to protect intellectual property, and establishment of appropriate standards and certification, to name a few.

MODERATOR:
Stephen G. Anderson
SPIE, Director, Industry Development

PANELISTS:
Denis Cormier
AMPrint Center
Director, Earl W. Brinkman Professor of Industrial and Systems Engineering

Pat Grace
TRUMPF, North American Sales Manager

Rich Stump
FATHOM, Co-Founder and Principal

Bo Gu
Consultant

Andy Martin
GE Aviation, Additive Manufacturing

The 7 Biggest Challenges Executives Will Face in 2017

Wednesday 1 February • 1:30 to 2:30 pm
Location: South Exhibit Level, Room 103

Join us as industry leaders share their unique views of the current and future state of the optics and photonics business. From the challenges of ever-changing business landscapes to the uncertainties created by new competitive forces and technical innovation, the operating environment for photonics businesses continues to evolve rapidly.

You will hear informed commentary on emerging opportunities and new challenges from around the world. Leaders representing different aspects of the photonics marketplace provide a personal perspective of this fast-paced industry with observations about technology and market trends based on high-level business insight. Listening to and asking questions of these photonics industry executives will help you better understand the current industry environment and set priorities for your business.

MODERATOR:
Stephen G. Anderson
SPIE, Director, Industry Development

PANELISTS:
Christoph Fark
SCHOTT, Executive V.P. Business Unit Advanced Optics

Basil Garabet
NKT, CEO Photonics Group

Scott Keeney
nLIGHT, CEO and Co-Founder

Chuck Mattera
II-VI, President and CEO

Berthold Schmidt
TRUMPF, Managing Director
Photonics West Exhibition
Wednesday 1 February • 10:00 am to 5:00 pm
Location: South ABC and North D Exhibit Halls

Job Fair
Wednesday 1 February • 10:00 am to 5:00 pm
Location: South Exhibit Hall

Selling Globally: Legal and Company Insights on Export Laws and Regulations
Wednesday 1 February • 3:00 to 4:00 pm
Location: South Exhibit Level, Room 102

If your company’s sales activities, products or services come into contact with foreign jurisdictions, this is a must-attend program. The stakes have never been higher. Anyone who wants to answer questions such as, “How do U.S. export controls apply to me?” or “What are the legal pitfalls of doing business internationally?” or “What are best practices for engaging in global trade?” will benefit from attending this workshop.

INTENDED AUDIENCE: Owners, executives, business development leaders, and product managers who wish to learn how to grow business while effectively and efficiently navigating U.S. and international trade laws and regulations.

Q&A and networking to follow.

SPEAKERS:
Mike DeMarco
QED Optics, Business Manager
Kerry Scarlott
BakerHostetler

SPIE Startup Challenge
Wednesday 1 February • 3:30 to 6:00 pm
Location: South Exhibit Level, Room 103

Hear the best new company pitches!
With over $85,000 in cash, prizes, promotion, and more, this is an event not to be missed.

See and hear pitches for the “best of the best” new photonics businesses. This pitch competition is a lively, interactive event showcasing the power of entrepreneurs to move photonics technology to the global marketplace. New entrepreneurs in photonics will have just 5 minutes each to pitch their businesses to a team of expert judges.

The top pitch presenter will go home with $10,000 in cash from Jenoptik and $5,000 of equipment from Edmund Optics. Join analysts, VCs, and business development executives to scout new talent, identify potential investments, and see what the future of entrepreneurship in photonics looks like.

The event will conclude with a networking reception from 5:00 to 6:00 pm where you can meet the presenters and fellow attendees involved in photonics entrepreneurship.

FOUNDING PARTNER
SUPPORTING SPONSORS
Jenoptik
PRISM Awards Ceremony and Banquet

Wednesday 1 February • 6:00 to 10:00 pm
Seating is limited. Tickets are required in advance. Email innovation@spie.org for more information.

Join this gala event in which the most innovative photonic products on the market are recognized. 28 companies (finalists) from nine categories will share the room with industry leaders and visionaries. The event has become the largest gathering of CEOs and VIPs in the photonics industry. The evening begins with a reception, followed by an elegant dinner and award ceremony. Dress is business and formal attire.

PRESENTED BY: SPIE.

MEDIA SPONSOR: PHOTOSONICS MEDIA
Keynote Presentation: Navigating Science, Technology and the Budget in President Trump’s Washington

Thursday 2 February • 9:15 to 9:45 am
Location: South Exhibit Level, Room 103

SPEAKERS:

Josh Holly
The Podesta Group

Beth Inadomi
The Podesta Group

Come hear a leading Washington, D.C. lobbyist talk about what is being “heard on the hill” regarding the budgets behind emerging technologies and science.

The Podesta Group is a top-ranked bipartisan team of tested global advocacy and strategic communications specialists located in Washington, DC. Our strength is our people – tested leaders within their fields who cut their teeth where it counts: at the highest levels of government, in the boardroom, on the campaign trail and inside the newsroom. Always original, never ordinary, we imagine and execute inventive, integrated, data-based campaigns that don’t just ignite conversations, but inspire action and change outcomes.

Photonics West Exhibition
Thursday 2 February • 10:00 am to 4:00 pm
Location: South ABC and North D Exhibit Halls

Startup Alley: Commercialization and Prototype Showcase
Thursday 2 February • 11:00 am to 1:00 pm
Location: South Exhibit Hall

Meet with the entrepreneurs featured in the Startup Challenge as they pitch their new photonics businesses. See the prototypes and talk with the entrepreneurs to explore potential partnerships, investment, or sales.
WEDNESDAY 1 FEBRUARY 2017
6PM COCKTAIL RECEPTION
7PM DINNER & AWARDS CEREMONY

Formal or business attire
For ticket information, visit the SPIE Cashier

“It's amazing to have an idea at a university and to see it installed at a BP refinery and to make one place in the world a little bit safer.”

–Allison Lami Sawyer
Rebellion Photonics CEO
Wall Street Journal Startup of the Year
Prism Award Presenter
Congratulations to the 2017 finalists.

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www.prismawards.org
How to Select the Right Detector Technology for Your Application

Monday 30 January • 10:00 am to Noon
Location: South Exhibit Level, Room 102
Price: Free

INSTRUCTOR: Slawomir Piatek, Hamamatsu

SPONSORED BY: Hamamatsu

The selection process of the best-performing photodetector for a given application can be a source of frustration and inefficiency. However, it doesn’t have to be. Good familiarity with the available photodetector choices, which encompasses understanding their principles of operation, regimes of operation, and limits of operation, can make the process remarkably simple. The talk discusses the basics of photodetectors and how to select the correct one under different circumstances.

The goal of this presentation is to provide background information on four types of photodetectors:
• Photomultiplier Tube
• Photodiode
• Avalanche Photodiodes
• Silicon Photomultiplier

INTENDED AUDIENCE: Design/system engineers, managers, directors, university researchers and contractors who are involved with design of any system using any type of photodetectors.

The Very Least You Need to Know About Optics

Monday 30 January • 10:30 am to 12:30 pm
Location: Visit the SPIE Course Desk for details
Price: $100 • CEU: 0.2

INSTRUCTOR: Damon Diehl, DIEHL Research Grant Services

This course is tailored to the thousands of professionals working in the optics industry who are not engineers. The curriculum develops a foundational understanding of the core principles of optics by relying on visual examples rather than mathematics. Upon completion of the course, students will be able to follow the thread of most technical optical presentations, and they will be well-positioned to study more specialized topics related to specific industries.

LEARNING OUTCOMES:
• Define the law of reflection
• Define the law of refraction (Snell’s Law)
• Classify different types of optical elements visually
• Explain the impacts of dispersion on optical systems

INTENDED AUDIENCE: This course is intended for non-engineers, particularly sales professionals, who need a rapid, non-mathematical introduction to the core principles of optics. No prior scientific or mathematical background is assumed.
Basic Optics for Non-Optics Personnel

Monday 30 January • 1:30 to 4:00 pm
Location: Visit the SPIE Course Desk for details
Price: $150 • CEU: 0.3

INSTRUCTOR: Kevin G. Harding, GE Global Research

This course will provide the technical manager, sales engineering, marketing staff, or other non-optics personnel with a basic, non-mathematical introduction to the terms, specifications, and concepts used in optical technology to facilitate effective communication with optics professionals on a functional level. Topics to be covered include basic concepts such as imaging, interference, diffraction, polarization and aberrations, definitions relating to color and optical quality, and an overview of the basic measures of optical performance such as MTF and wavefront error. The material will be presented with a minimal amount of math, rather emphasizing working concepts, definitions, rules of thumb, and visual interpretation of specifications. Specific applications will include defining basic imaging needs such as magnification, depth-of-field, and MTF as well as the definitions of radiometric terms.

LEARNING OUTCOMES:
• Read optical system descriptions and papers
• Ask the right questions about optical component performance
• Describe basic optical specifications for lenses, filters, and other components
• Assess differences in types of filters, mirrors and beam directing optics
• Describe how optics is used in our everyday lives

INTENDED AUDIENCE: This course is intended for the non-optical professional who needs to understand basic optics and interface with optics professionals.
**Silicon Photomultiplier: Theory and Practical Demonstrations**

Tuesday 31 January • 8:00 am to 12:00 pm  
Location: South Exhibit Level, Room 102  
Price: Free

**INSTRUCTOR:** Slawomir Piatek, Hamamatsu

**SPONSORED BY:** Hamamatsu

This workshop (presentation and practical demonstrations) will discuss the silicon photomultiplier (SiPM), also known as multi-pixel photon counter (MPPC). SiPMs are essentially an opto-semiconductor device but have excellent photon-counting capability and can be used in various applications for detecting extremely weak light at the photon counting level.

The main goals of this workshop are:

- Develop a good theoretical understanding of how a SiPM functions
- Become familiar with its key opto-electronic characteristics and how to measure them
- Discuss realistic applications which use SiPMs
- Gain a hands-on experience in characterizing SiPMs and in observing their operation in a variety of situations

**INTENDED AUDIENCE:**

The talk is open to anyone who uses low light level photodetectors or is involved with design of any system using photo detectors.

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**Photonics West Exhibition**

Tuesday 31 January • 10:00 am to 5:00 pm  
Location: South ABC and North D Exhibit Halls

Come see the latest devices, components, and systems that are enabling today’s technology trends. With more than 1,300 companies, this exhibition continues to be the flagship event to find the latest products, tools, and applications for your research or business needs.

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**Job Fair**

Tuesday 31 January • 10:00 am to 5:00 pm  
Location: South Exhibit Hall

**Top employers are coming together to interview and hire candidates at Photonics West 2017**

Meet over 30 recruiters on the exhibition floor including Apple, Daylight Solutions, DSI, II-VI, KLA Tencor, Lumentum, Microsoft, ACT, Newport, Rockley, Thorlabs, Harris, General Atomics, and more. Whether you are looking for employees or looking for a job, this is your chance to connect with the best.

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**The New Sales Model: How to Bring Customers to You**

Tuesday 31 January • 12:15 to 3:00 pm  
Location: South Exhibit Level, Room 102  
Price: Free

**INSTRUCTOR:** Michele Nichols, Launch Team Inc.

**Interactive workshop. Come with questions. Snacks provided.**

Looking to improve the ROI on your marketing and sales? Compare notes with your peers in this open discussion. Speaker Michele Nichols will share successes and lessons learned across many of the optics and photonics companies she works with, and will facilitate this roundtable session.

This session will include a marketing roundtable discussion, ‘how to bring customers to you’ ideas, practical tips for companies from start-up to second stage growth, etc.

**INTENDED AUDIENCE:** VP of marketing or sales, product managers, marketing staff, and others in “customer development” with responsibility for ensuring a healthy pipeline.
ZEMAX PRODUCT TUTORIAL: Bridging the Gap Between Optical and Optomechanical Design

Wednesday 1 February • 8:30 am to 12:30 pm
Location: Visit the SPIE Course Desk for details
Price: Free, registration required

INSTRUCTORS: Esteban Carbajal and Kristen Norton, Zemax

SPONSORED BY: Zemax

Taking an optical system from concept to production is a complex process that typically involves the teamwork of multiple engineers. Additionally, the design process requires countless iterations that impacts both the optical and mechanical engineers. The current process that utilizes the transfer of STEP, IGES, or STL files is often rife with inefficiencies and errors that cause delays and drives up costs. Learn how Zemax has improved the engineering design process for both optical and mechanical engineers with OpticStudio and LensMechanix. Awareness and understanding of the new software tools available from Zemax that streamlines engineering design workflow and improves results while driving efficient operations.

LEARNING OUTCOMES:
• Optimize, analyze, and tolerance a sequential system in OpticStudio
• Optimize a sequential design for conversion to nonsequential mode
• Load a sequential design into SOLIDWORKS using LensMechanix
• Package, analyze, and validate your complete optomechanical design

INTENDED AUDIENCE: Optical Engineers, Optomechanical Engineers, and Engineering Department Leaders

HAMAMATSU TUTORIAL: Single-Photon Detection: SiPMs versus PMTs

Wednesday 1 February • 8:30 am to 5:30 pm
Location: Visit the SPIE Course Desk for details
Price: Free, registration required

INSTRUCTOR: Slawomir Piatek, Hamamatsu

SPONSORED BY: Hamamatsu Photonics K.K.

Since the early 1990s, a silicon photomultiplier (SiPM) has become a viable alternative to a photomultiplier tube (PMT) in selecting a photodetector for applications where the light signal may consist of a few photons. Though an alternative, SiPMs are not likely to make PMTs obsolete because each detector has a unique set of advantages over the other. Therefore, the invention of SiPMs has increased the selection choice. This course reviews the physics of operation of both devices, describes their key opto-electronic characteristics and how to measure them, and compares their performance. The course also discusses several applications for which the selection choice between a PMT or a SiPM may be very subtle. To select the right detector for a given low-light-level application, it is essential to understand the strengths and limitations of each available photodetector. This course will assist the potential user in making the most educated and rational selection, especially between a SiPM and PMT.

LEARNING OUTCOMES:
• Describe the generic structure of a SiPM and a PMT.
• Explain the physics of operation of the devices.
• Identify the key opto-electronic characteristics of the devices such as gain, quantum efficiency, photon detection efficiency, breakdown voltage, overvoltage, and more.
• List and describe noise sources such as dark counts, multiplication noise, after-pulsing, cross-talk and more and how they depend on temperature, bias, structure, and other parameters.
• Demonstrate lab methods of characterizing the devices. Discuss ways of measuring excess noise.
• Compare the performance of a SiPM versus that of a PMT in a variety of conditions.
• Discuss operating a SiPM and PMT in either a continuous or photon counting mode.
• Become familiar with the most common applications of SiPMs and PMTs.
• Understand the selection process of a photodetector based on case studies of realistic low-light-level applications.

INTENDED AUDIENCE: Design/system engineers, managers, directors, university researchers and contractors who are involved with the design of any system using photodetectors, specifically low light detectors.
Crosslight Product Tutorial: Introduction to Optoelectronic Device Simulation and VCSEL Design

Wednesday 1 February • 8:30 am to 5:30 pm
Location: Visit the SPIE Course Desk for details
Price: Free, registration required

INSTRUCTORS:
Joachim Piprek, NUSOD Institute and
Zhiqiang L. Li, Crosslight Software

SPONSORED BY: CROSSLIGHT

The course introduces design principles of modern optoelectronic devices such as vertical-cavity lasers and nitride light emitters. It includes hands-on exercises and provides basic skills for operating advanced simulation software. Deep insight into micro- and nano-scale physical processes is given using real-world device examples. Key material properties are discussed and strategies for obtaining realistic simulation results are described.

LEARNING OUTCOMES:
• Describe advanced device simulation software with comprehensive electrical, optical and thermal models
• Explain DC, transient and small-signal device analysis
• Describe basic principles of optoelectronic device physics
• Explain key semiconductor material properties and parameters
• Describe design of modern optoelectronic devices

INTENDED AUDIENCE: Students, device engineers, and researchers who are interested in a deeper understanding of optoelectronic device principles and in using advanced simulation software for designing and analyzing modern devices.

Open Session of the Sensors and Instrumentation Technical Advisory Committee

Wednesday 1 February • 9:00 to 10:30 am
Location: South Exhibit Level, Room 102
Price: Free

SPIE, in conjunction with the Department of Commerce Sensors and Instrumentation Technical Advisory Committee (SITAC), is forming working groups comprised of industry and research university representatives that will assist in identifying and developing proposals related to improving the export control system in photonics.

MODERATOR: Jennifer Douris, SPIE Government Affairs Director

BACKGROUND: Technical Advisory Committees (TACs) advise the Department of Commerce on the technical parameters for export controls applicable to dual-use commodities and technology and on the administration of those controls. The TACs are composed of representatives from industry and Government representing diverse points of view on the concerns of the exporting community. Industry representatives are selected from firms producing a broad range of goods, technologies, and software presently controlled for national security, foreign policy, nonproliferation, and short supply reasons or that are proposed for such controls, balanced to the extent possible among large and small firms.

TAC members are appointed by the Secretary of Commerce and serve terms of not more than four consecutive years. The membership reflects the Department’s commitment to attaining balance and diversity. TAC members must obtain secret-level clearances prior to appointment. These clearances are necessary so that members can be permitted access to relevant classified information needed in formulating recommendations to the Department of Commerce. Each TAC meets approximately four times per year. Members of the TACs are not compensated for their services.
Photonics West Exhibition
Wednesday 1 February • 10:00 am to 5:00 pm

Basics of Laser Material Processing
Wednesday 1 February • 1:30 to 3:00 pm
Location: South Exhibit Level, Room 102
Price: Free

INSTRUCTOR: Jean-Philippe Lavoie, Coherent

SPONSORED BY: Coherent

Learn the basics of lasers and laser applications in this interesting and valuable workshop.
* Discuss what happens when a laser beam hits a material
* Review process threshold and process window
* Discussions of how you can optimize a process. Including examples of marking and ablation / engraving or cutting
* Discussion around some common things that can go wrong
* Additional examples of successful laser applications

INTENDED AUDIENCE: Open to anyone. Especially valuable to non-laser engineers and project managers who need to know what to expect from their laser systems.

Job Fair
Wednesday 1 February • 10:00 am to 5:00 pm
Location: South Exhibit Hall

Department of Commerce BIS Session on the Export Control Notice of Inquiry and Public Comment Period
Wednesday 1 February • 4:00 to 5:00 pm
Location: South Exhibit Level, Room 102
Price: Free

Learn first-hand from experienced U.S. Government officials at the Bureau of Industry and Security (BIS) about export control policies, regulations and procedures that impact optics and photonics, including current issues and trends in export control.

Q&A and networking to follow.
Export Control Working Group: Lasers
Thursday 2 February • 10:00 to 11:00 am
Location: South Exhibit Level, Room 102
Price: Free

MODERATOR: Jennifer Douris, SPIE Government Affairs Director

SPIE, in conjunction with the Department of Commerce Sensors and Instrumentation Technical Advisory Committee (SITAC), is forming working groups comprised of industry and research university representatives that will assist in identifying and developing proposals related to improving the export control system in the areas of Detector & Cameras, Lasers and Lenses & Optics.

Discussion Topic:
- Lasers
- Fiber
- Diode
- High Powered

Export Control Working Group: Lenses and Optics
Thursday 2 February • 1:30 to 2:30 pm
Location: South Exhibit Level, Room 102
Price: Free

MODERATOR: Jennifer Douris, SPIE Government Affairs Director

SPIE, in conjunction with the Department of Commerce Sensors and Instrumentation Technical Advisory Committee (SITAC), is forming working groups comprised of industry and research university representatives that will assist in identifying and developing proposals related to improving the export control system in the areas of Detector & Cameras, Lasers and Lenses & Optics.

Discussion Topic: Lenses and Optics

Export Control Working Group: Cameras
Thursday 2 February • 11:30 am to 12:30 pm
Location: South Exhibit Level, Room 102
Price: Free

MODERATOR: Jennifer Douris, SPIE Government Affairs Director

SPIE, in conjunction with the Department of Commerce Sensors and Instrumentation Technical Advisory Committee (SITAC), is forming working groups comprised of industry and research university representatives that will assist in identifying and developing proposals related to improving the export control system in the areas of Detector & Cameras, Lasers and Lenses & Optics.

Discussion Topic:
- Detectors and Cameras
- Uncooled
- Cooled
- SWIR
- Cryocoolers
- ROICs
- Image Intensifiers
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RESOURCES FOR INDUSTRY

Find what you need at SPIE, the definitive global business resource for the photonics industry and its members.

- **MARKET DATA: THE SIZE OF THE OPTICS AND PHOTONICS MARKET**
  SPIE is the first to establish the size of the core global optics and photonics marketplace, conduct year-over-year analysis, and size the enabled markets.

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- **CORPORATE MEMBERSHIP**
  The SPIE Corporate Membership program provides exhibition booth “priority points”, discounts, brand exposure, business networking opportunities, as well as access to information, education, government relations, student outreach, and more. There is a reason why SPIE has more Corporate Members than any other organization in our field.

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- **TRAINING AND EDUCATION**
  Continuing education is an important investment in your company and your career. SPIE has a variety of options: courses at SPIE events, online courses, in-company training, and courses on DVD. Think of SPIE as your resource for lifelong learning.

- **RECRUITMENT SERVICES**
  SPIE has helped thousands of photonics-focused companies find the right employees and thousands of employees find the right job. The SPIE Career Center, Job Fairs, and Student Program Sponsorships provide opportunities to help you win the war for talent.

- **PHOTONICS CLUSTERS**
  SPIE supports groups of optics-related firms and universities that maintain strong research and workforce ties, create quality jobs, and develop regional economies. Together, we work with government and stakeholders to strengthen the industry and grow your business.

- **AWARD PROGRAMS**
  From the SPIE Startup Challenge to the PRISM Awards, SPIE is dedicated to supporting and recognizing innovative companies in our industry. Since 1955 SPIE has been honoring individuals in optics and photonics for their scientific, technical, and service achievements.

- **OPTICS.ORG**
  optics.org, a subsidiary of SPIE, is the longest-running online resource for OEMs and system integrators in the core growth markets for photonics applications. It’s been delivering the latest company, product, and business news, in-depth articles on applications, and market analysis for over 15 years.

- **SPIE DIGITAL LIBRARY**
  Whether looking for new technical possibilities, collaboration partners, researching the current state-of-the-art technologies (and what competitors are working on) or simply staying up-to-date in the field, having access to the world’s largest collection of optical research, innovation, and engineering know-how is critical for business success.

QUESTIONS? COMMENTS? EMAIL: INNOVATION@SPIE.ORG
SPIE is the international society for optics and photonics

MOVING TECHNOLOGY TO MARKET.

ABOUT SPIE
SPIE is the international society for optics and photonics, an educational not-for-profit organization founded in 1955 to advance light-based science and technology. The Society serves nearly 264,000 constituents from approximately 166 countries, offering conferences and their published proceedings, continuing education, books, journals, and the SPIE Digital Library in support of interdisciplinary information exchange, professional networking, and patent precedent. SPIE provided more than $4 million in support of education and outreach programs in 2016.

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