



Florida Photonics Update

The Florida Photonics Cluster Newsletter

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October 2016

FROM THE PRESIDENT - Alex Fong



I recently had the privilege of attending the i-Corps Lean Start-Up Crash Boot Camp at the Winter Springs Incubator

(<https://incubator.ucf.edu/winter-springs-ucf-business-incubator-will-host-boot-camp-introduce-innovators-startup-method-corps/>).

Having worked in spin-offs, start-ups and even launched my own LLC some time ago (in addition to Fortune 500 corporations and leading corporations in aerospace, electronics

components and telecommunications and photonics), I have always been interested in entrepreneurship and in learning more. I believe there is value to bringing such skills to the corporate world where the emphasis on structure and process sometimes inhibits innovation. In fact, it was with the idea of developing a short internal course on 'intrapreneurship' aimed at the product management at my current employer that I decided to attend. With its focus on 'customer discovery' it turned out to be ideal for just that.

First some background however. i-Corps is a National Science Foundation (NSF) program with the following charter:

NSF Innovation Corps (I-Corps™)

**Save the Date!...Next
FPC meeting December
8, 2016**

**WELCOME NEW FPC
MEMBERS!**

**Services and discounts
provided by FPC
member supplier
companies**

**DON'T MISS OUT!!!
ENJOY THE BENEFITS
OF FPC MEMBERSHIP**

Join Our List

Join Our Mailing List!

I-Corps prepares scientists and engineers to extend their focus beyond the laboratory, and broadens the impact of select, NSF-funded, basic-research projects.

Much of the program was based on the work of serial entrepreneur Steve Blank, and utilizes his "lean start-up" concepts (<https://steveblank.com/about/>).

While the program covered some basics of entrepreneurship common in all programs, i-Corps emphasized the importance of the "customer discovery" process. This is the critical stage of identifying a market/customer/audience's needs (or pains) which the potential product must address. This is not a new concept of course, but promulgating its importance, breaking down the steps involved in engaging customers and focusing the student of the key goals of the exercise, set this program apart. Many of us involved in sales and marketing will recognize a lot of the participants, terms and elements in the customer discovery process. However, where customer discovery departs from the sales practice is that one is not there to sell.

While interest can be cultivated, you must enter with as little of a preconceived notion of what the product should be or what the customer wants. This is not meant to be a show and tell/feedback opportunity for your prototype or business model. In this way, it differs from the "voice of customer" exercises taught in many corporate courses. For most entrepreneurs, this will take quite a lot of self-restraint and discipline.

Still, if you can hold-off and listen objectively, you will be able to determine if your idea is viable, and if so, how it needs to change to be successful. Thus, this is a valuable tool not only for entrepreneurs and inventors seeking to commercialize their ideas, but also for anyone in a product development or management role. While it's true that no product, however great, sells itself, it is also true that no amount of aggressive salesmanship or clever marketing can overcome an outdated or poor product concept. That's an important concept to remember no matter what your station is, whether you are a budding entrepreneur or seasoned executive.

Special thanks to the incubator staff including Vanessa Zabala, Nodar Gogoberidze, the instructors, Michael O'Donnell, Oscar Rodriguez and the mentors Dave Spitzer, George Gramatikas, Mark Blue, and Deepak Mohan.

<https://icorps.cie.ucf.edu/about-us/>

This is an excerpt of a longer recently published piece that can be found here on LinkedIn:

<https://www.linkedin.com/pulse/roi-listening-alexandre->

Company Spotlight: Multicore Photonics, Inc.

Enabling Industry 4.0

I recently met Darren Engle, President and CEO of Multicore Photonics, Inc., to learn more



about their exciting technology venture, spun-off from UCF CREOL research.

Darren is former VP of Engineering and Global Services at FAZ Technology, Inc. and prior President and CEO of Acudyn Incorporated. Darren is a serial entrepreneur with extensive experience in starting and developing high growth technology based businesses.



With over 14-years of industry experience in Energy and Oil & Gas, Mr. Engle provides strategic direction for Multicore Photonics Inc.'s long-term growth, which includes establishing customer loyalty, securing intellectual capital, building intellectual property, increasing brand recognition and maximizing earning potential. His responsibilities range from day to day finance and operations to business development, equity fund raising and legal oversight. Mr. Engle's extensive industry experience, financial expertise, and strategic skills positioned him well for his post.

Mr. Engle was honored by being selected as a participant in the 2011 NREL Executive Energy Leadership program (Energy Execs), a premier leadership program at the National Renewable Energy Laboratory in Denver, CO focused on delivering clean energy solutions. He holds a Masters of Business Administration and a Bachelor of Science in Mechanical Engineering from the University of Central Florida. In addition to his studies, Mr. Engle proudly participates in local and international philanthropy projects. He is known by many to be an entrepreneur, inventor, philanthropist, and adventurer.

Here are some excerpts of our discussion...

Alex Fong: Can you tell us about your company/background/history?

Darren Engle: Founded in 2015, Multicore Photonics, Inc. is a for profit corporation located in Orlando, Florida that develops next generation "smart" fiber optic sensors, systems and platforms for

industrial applications using a novel multicore fiber (MCF) technology exclusively licensed from CREOL.

CREOL, the College of Optics and Photonics at the University of Central Florida, is one of the world's foremost institutions for research and education in optical and photonic science and engineering.

In addition to the licensed MCF IP, since formation we have filed 6 patents around MCF to include sensor embodiments as well as methods and approaches thereby further expanding our portfolio. I envision the size and value of IP surrounding MCF to exceed that of fiber Bragg grating (FBG).

AF: What are some challenges you face today? How are you coping with the current economic conditions?

DE: The biggest challenge is penetrating the proverbial veil of industrial sensing as this is an area of sensing that has historically been relegated to electrical based sensors, systems and platforms.

Economically, the area of industrial sensing is starting to gain momentum. It is being driven by the movement called Industry 4.0, a changing of paradigms. Leveraging the Industrial Internet of Things (IIoT) to expand the capability and most important profitably of a globally deployed industrial asset base worth well over a 100 trillion dollars. Most of which have been in operation for over two decades and will require upgrading with a next generation of sensors and sensing platforms. The upgrade and replacement of existing legacy sensors and sensing platforms for these in place heavy assets will, over the next 20 years, dwarf the sales of yearly new builds.

AF: What distinguishes your company/organization from your competitors or other, similar organizations?

DE: We are the first company to offer a complete optical monitoring platform in which the sensors are seamlessly *integratable* with legacy control systems. This gives the Owner/Operator the ability to take a risk adverse controlled approach to expanding their assets capabilities.

This is only made possible though the utilization of multicore fiber technology (MCF) as it allows us to be able to use the same fiber sensing element and interrogator packaged in different form-factors to monitor all required physical responses and environmental conditions of an industrial asset.

AF: Do you seek to partner/collaborate with other organizations: universities, companies, other? If so, is it for research, marketing, manufacturing, other?

DE: We currently are partnered with UCF as well as a few key optics companies however we are always looking for solid organizations in which a win/win relationship can be established.

AF: Do you have a memorable success story you'd like to share?

DE: We have successfully demonstrated as part of Phase I National Science Foundation (NSF) SBIR grant the novelty of a multi-species gas sensor, i.e. a chemical sensor, calibrated to measure and monitor levels of NO_x. The NSF SBIR Phase I program was titled "Fiber Optic Based Nitrogen Oxides Sensor", reference https://www.nsf.gov/awardsearch/showAward?AWD_ID=1548591

AF: What are your future plans?

DE: Multicore is currently focused on the chemical sensing vertical for the Automotive Industry, developing a NO_x sensor that can successfully generate the data needed to support the emissions control industry's goal of lowering NO_x emissions standards while simultaneously meeting their needs of robust operation and economical implementation.

Multicore is focused specifically on the market made up of man-made NO_x emissions including high-temperature combustion processes such as those occurring in automobiles, heavy construction equipment and power plants.

The broad market for Multicore's NO_x sensor is the Global Emission Controls Market which consists of emissions including Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Hydrocarbons (C_nH_{2n}), Sulfur Oxides (SO_x), Volatile Organic Compounds (VOC's) and Particulate Matter (PM).

However, it is worth noting that the novelty of this sensor as aforementioned gives us the ability to reconfigure the sensor with software alone to measure and monitor concentration levers of other gases.

Once adequate market share of the chemical sensing vertical has been established, Multicore will expand into other sensing verticals, e.g. Temperature, Pressure, Flow, etc.

AF: Thanks for your time!

DE: Most welcome.

UCF is Number One supplier of engineers to the aerospace and defense industries

The University of Central Florida produces more graduates who get jobs in aerospace and defense companies than any other university in the nation, according to an annual workforce survey conducted by the top aviation industry publication in the U.S.. See <http://today.ucf.edu/ucf-is-1-supplier-of-engineers-to-aerospace-and-defense-industries/> for more on this fine achievement.

FPC General Members meeting at Sanford Burnham Prebys (SBP) Sept. 21, 2016

There were many interesting presentations at the recent FPC meeting. Here is a brief summary:

1) Dr. Chrys Panayiotou gave a brief update on the NSF-ATE LASER-TEC program (www.laser-tec.org) at Indian River State College that is developing new photonics technician resources for the 8 Southeast region states. In addition to the 21 schools in the Southeast region currently being addressed by the program, Spokane Community College in Washington and Puerto Rico Photonics Institute are partner schools. The program is also working with Irvine College in California to start a program in southern California.

2) Chip Roberts, Asst. V.P. for Development, UCF College of Medicine gave an overview of work at UCF College of Medicine and School of Biomedical Sciences. A few highlights:

-- The College of Medicine now has 5 locations, 686 faculty and staff, and 11 specialty areas.

-- They currently have 480 MD students and 126 residency people.

-- The students have done very well compared to national averages in Step 1 (basic) exams and Step 2 (specialty) exams.

3) Dr. Bahaa Saleh, Dean & Director of CREOL, The College of Optics and Photonics, and Professor of Optics & Photonics, gave an overview of the ongoing biophotonics research at the college. A few highlights:

-- The college currently has 34 faculty members, 17 faculty with joint appointments, 6 emeritus professors, 76 research scientists, 152 graduate students and 90 undergraduate students. They are looking for a senior faculty member in the area of biomedical optics and photonics.

-- The key research areas at CREOL that are very important for many therapeutic and surgical applications in biology and medicine include: a) lasers for their tunability,

depth of penetration, power concentration, variable pulse duration; b) sensors, particularly integrated and nano devices; c) imaging and fluorescence generation.

4) Dr. Stephen Gardell, Sr. Director, Scientific Resources & Assoc. Professor, Cardiovascular Metabolism Program, Center for Metabolic Origins of Disease, gave an overview of SBP. A few highlights:

-- The Florida operation of SBP was started as a Center for Metabolic Origins of Disease. The areas of emphasis now also include disease research and drug discovery science.

-- The SBP has 250 staff, 185 of whom are scientists. These staff have received \$112M in research grants so far and published 300 scientific papers.

-- A major emphasis among the staff is teamwork and collaboration.

5) The program concluded with a very interesting tour of the SBP facilities.

MJ Soileau is honored by the FL Inventors Hall of Fame

Dr. MJ Soileau, UCF University Distinguished Professor of Optics and Photonics, Electrical and Computer Engineering, and Physics was honored on September 16, 2016 by induction into the Florida Inventors Hall of Fame. He was cited for putting the University of Central Florida on the high-tech map through his inaugural leadership of the Center for Research and Education in Optics and Lasers (CREOL), his vision for a College of Optics and Photonics, and, as Vice President for Research and Commercialization, his stewardship of a 260 percent growth of sponsored research funding, and the establishment of a nationally recognized commercialization ecosystem. The full citation can be seen on page 19 of the [Induction Ceremony program](#).



MJ and Shin-Tson Wu of CREOL
(ST was 2014 Inductee)

FPC supports DoL O*NET update for Photonics Technicians

The FPC was recently contacted by and has been working with RTI International to help them identify Occupational Experts (OEs) that can assist with the 2016 update of the Department of Labor (DoL) listing for photonics technicians [17-3029.08 - Photonics Technicians - O*NET OnLine](#) . O*NET is the nation's primary source of occupational information and is used by millions for career exploration and job analysis at www.onetonline.org. The

FPC also assisted with the last update of this information in 2010.

CREOL Bachelor of Science program gets excellent ABET review

On Sept. 26, ABET reviewed the CREOL Bachelor of Science in Photonic Science and Engineering, which is led by Mike McKee with great support from the rest of the CREOL staff and faculty. [ABET](#) is a nonprofit, non-governmental organization, recognized by the Council for Higher Education Accreditation, that accredits college and university programs in the disciplines of applied science, computing, engineering, and engineering technology at the associate, bachelor, and master degree levels.

Mike reported after the review meeting, "ABET presented their summary report yesterday (Tuesday, Sept. 27) and the program was found to have only 1 concern listed. Concerns are the lowest level that can be documented and requires no action on our part before our next accreditation cycle in 4 years." Many congratulations to Mike and all of CREOL for this excellent result!

FPC member companies exhibiting at SPIE DCS-2017 in Anaheim, CA

Several FPC members will be exhibiting at the SPIE [Defense + Commercial Sensing Expo](#) 11-13 April 2017 in Anaheim, CA:

- [Analog Modules](#)
- [CREOL/UCF](#)
- [E. R. Precision Optical Corp.](#)
- [IMPERX Inc.](#)
- [JENOPTIK Optical Systems](#)
- [LightPath Technologies](#)
- [Ocean Optics, Inc.](#)
- [OptiGrate Corp.](#)

Companies electing location with the Florida cluster grouping receive a 10% discount on the first 10x10 booth space and the grouping gets a very good location on the exhibit floor, so if your company has not yet signed up to exhibit at this event, there is still time to do so even though the Early Bird discount is no longer available. The DCS meeting returns to Orlando, Florida in 2018 as part of a new 3-city rotation for the event. The FPC plans to work with CREOL again to organize a Florida cluster grouping in 2018 on the show floor.

Save the Date! Next FPC meeting December 8

The Florida Photonics Cluster will hold its next meeting on Thursday, Dec. 8 at the Heritage Club in Kissimmee. The agenda is still being finalized, but even though this is the official Annual Meeting of the association, all interested parties are welcome to attend with no registration fee. To receive the agenda and a full RSVP invitation, send an email to Jim Pearson, FPC Executive

Director, at jpearson@creol.ucf.edu.

WELCOME NEW FPC MEMBERS!

The FPC is delighted to recognize the companies that have joined the association since September 2015:

- [Mike Fenn](#), Asst Prof / Dir Center for Medical Materials and Biophotonics at Florida Institute of Technology
- [ICAMR, Inc.](#) - International Consortium for Advanced Manufacturing Research
- [iRep, Inc.](#) supporting Open Architecture Products, Rugged Systems and Test Equipment across the Southeastern United States.
- [Mangove Photonics](#), providing optics & photonics consulting services
- [Multicore Photonics](#), developing fiber optic sensors and instrumentation for industrial applications.
- [Laser Photonics Academy](#) at Wekiva High School providing an optics/photonics dual enrollment program in partnership with Valencia College
- [PhiLumina, LLC](#), specializing in imaging systems, software, services, and solutions.

Utilize the services and discounts provided by FPC member supplier companies!

One of the advantages of FPC membership is the network of suppliers to our industry, and particularly the suppliers who have joined the FPC and some of whom offer discounts to FPC members. Here is a brief list; further information is on the FPC website under the Members listing.

- [Bond, Schoeneck, & King, PLLC Attorneys](#). Provides a full range of Intellectual Property services
- [Coastal Cloud](#). Provides a 10% discount on their full range of services that include technology strategy & architecture, business process optimization, solution selection / configuration / implementation, user training & adoption as well as on-going solution administration.
- [Diamond Level Service](#). Event Design and Management services for trade shows, special events, conferences, and business presentations. Discounts are provided to FPC members.
- [Fowler, White, Burnett, Attorneys](#). Provides clients a talented roster of seasoned legal professionals who practice in numerous disciplines, including aviation, commercial litigation, corporate, bankruptcy and restructuring, maritime, health care, intellectual property, labor and employment, insurance defense, international, real estate, tax and white collar crime.
- [Laser Guardian](#). Provides a 10% discount on their full range of services that include testing laser systems for

emissions above safe limits as defined by the FDA under regulation 21CFR1040, and assisting in developing laser safety programs compliant to state and federal regulations through implementation of the ANSI Z136.1 standard for the safe use of lasers.

- [Laser Focus World & BioOptics World](#). Discounts provided to FPC members for ads in the magazines: 20% for print media, 15% for digital media.
- [Laser Institute of America](#). Discounts provided on LIA membership when joining for the first time, on ads in LIA media, and exhibit space at LIA meeting events.
- [OnTarget Web Solutions](#). Provider of internet marketing and web design services, including FPC web design and hosting.
- [Optics Professionals, LLC](#). Professional recruiting services, representing companies and individuals in optics and imaging technologies and related industries.
- [Williams & Associates](#). Provides wide range of promotional products and marketing services. 10% discount to FPC members.

In addition, if not yet a member, please urge your company to become a member of our partner associations:

- [Florida Defense Contractors Association](#). A statewide, state-focused advocacy and networking group with the mission to promote the business interests of Florida defense contractors and defense economic stakeholders.
- [Laser Institute of America](#). Corporate Members receive quantity discounts on all LIA products and services, reduced advertising rates in LIA's Journal of Laser Applications®, Membership Directory and LIA TODAY, a free web link from LIA's website to the web address, and a complimentary fifty word listing with company logo in LIA's annual Membership Directory.
- [Manufacturers Assoc. of Central Florida](#). A non-profit organization enhancing the manufacturing industry in Central Florida.
- [Orlando Economic Development Commission](#). The EDC provides key services and support, which range from relocation and expansion expertise to export counsel to long-term planning with our community partners.
- [OSA Industry Development Associates](#). OIDA provides a wide range of programs and services including: workshops, industry/roadmap reports, policy and funding advocacy, idea exchange sessions, professional networking activities, a multi-media publication and presentation archive, and exclusive member benefits.
- [SPIE 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.
- [CREOL Industrial Affiliates](#). The Industrial Affiliates program provides to industrial corporations, organizations, and

individuals many benefits. FPC members receive a discount when joining the Affiliates with a cash donation.

JOIN THE FPC TODAY!



[Enjoy the benefits of FPC membership!](#)

Why Join FPC? To Make Money!

Benefits of FPC Membership:

- Identify common needs and interests
- Leverage to develop opportunities through joint efforts, pooled resources and knowledge
- Regional, Statewide, National and International Reach
Small, Medium, Large Corporations, Academe, and Government all Benefit!

FPC Membership Benefits Include:

The strength of a unified industry voice for:

- Marketing and increased visibility of the photonics industry and FPC members through strategic marketing efforts
- Developing local and state executive and legislative support
- Interaction with economic development groups
- Workforce development, and advancement and improvement of educational infrastructure
- Obtaining group discounts
- Opportunities to participate in state and national sales and marketing efforts

And even more:

- Visibility for and ready access to your company through links from FPC's website, marketing literature, and trade show displays.
- An expansive resource network that includes partnerships with Enterprise Florida, area economic development organizations, the Florida High Tech Corridor Council, and UCF's CREOL, The College of Optics & Photonics to provide access to incentives, business development programs, research, and education.
- Annual and regional meetings of membership for

- networking
- Participation in optics/photronics-focused data collection with an annual survey monitoring the pulse of the industry
- Opportunities designed to develop Florida photronics companies into worldwide market participants
- Opportunities to participate in curriculum development at state universities and colleges
- Facilitated access to Florida's best and brightest students and the additional ability to recruit nationwide through the FPC website
- Membership Directory
- Visibility to potential customers
- Access to service providers that can assist your company and provide discounts
- Spotlight on member companies and products through periodic newsletter
- Several FPC member discount opportunities from photronics professional organizations, publishers, and service providers.

[Join FPC today and enjoy the benefits of membership!](http://www.floridaphotonicscluster.org)
[For more information, visit](http://www.floridaphotonicscluster.org)
[http://www.floridaphotonicscluster.org.](http://www.floridaphotonicscluster.org)

Greetings FPC Members and Friends,

The Florida Photonics Cluster is designed to support the growth and profitability of the Florida photronics industry through the strength of a unified voice to make Florida the place to go for photronics solutions. The FPC is dedicated to enhancing the industry through effective collaboration by bringing together the knowledge, expertise, and service that each of its members organizations has to offer.

FPC Goals

- Foster the expansion and growth of Florida's optics and photronics industry by partnering with economic development organizations, the state universities, and community colleges, and local and state governments.
- Market Florida's optics and photronics companies worldwide.
- Facilitate and provide a means of communication within the business community.
- Partner with the Florida education community to enhance and develop a competent statewide optics and photronics-based workforce.
- The FPC is a 501c(6) not-for-profit corporation, registered with the Florida State Division of Corporations.

For more information, visit www.floridaphotonicscluster.org

Sincerely,

Alexandre Fong, President
Florida Photonics Cluster

Jim Pearson, Executive Director

Florida Photonics Cluster, 12424 Research Pkwy, Ste 100, Orlando, FL 32826