

**Optics, Photonics, and Advanced Instruments Roundtable Executive Summary**  
**October 18, 2011 – Ozzy Properties, 1600 Osgood Street, North Andover**

**Anchors:**

<b>Name</b>	<b>Position</b>	<b>Representing</b>
John Dexheimer	President	<a href="#">LightWave Advisors</a>
Dennis Cope	President	<a href="#">Ophir Optics</a>
Dennis Merrill	Senior Director	<a href="#">Thermo-Fisher Scientific</a>
Karen Scammell	Global Sales Director	<a href="#">Axsun Technologies</a>

**Anchors Opening Remarks:**

**John Dexheimer** began the session by providing an overview of his background and experience in the optics and photonics industries. John has had over 20 years of experience in investment banking, venture capitalism, consulting, and advising within the industry. He was involved in the establishment of the first photonics company, Physical Sciences, Inc., located in Andover. Much of John's work involves making recommendations to Congress and the Department of Energy regarding the state of the industry. He recently attended two summer sessions of the National Academy of Science committee that will issue a report in 2012 to provide a national update on the state of optics and photonics in the US. The main goals of the report are to prioritize research questions to fill identified technological gaps in pursuit of national competitiveness, and to recommend actions for the development and maintenance of global leadership in optics and photonics.

Unlike other regions of the USA and the world, the photonics industry in Massachusetts is highly fragmented. The five main sectors in which optics and photonics are implemented are **communications, healthcare and life sciences, sensing light, defense and military, and manufacturing**. According to John, there has been a significant advance in "green photonics," which involves the use and production of solar LEDs and fiber optics. The information gained from this emerging field will have a significant impact in the future of the industry.

**Dennis Cope** welcomed all attendees to the discussion and invited all to join a tour of Ophir Optics's facilities following the roundtable. Ophir Optics specializes in the production of infrared lenses for use in both military and commercial industries. Ophir will also be involved in the production of pedestrian detection systems by 2015, in response to growing demand in Europe. Dennis explained that the optics industry is a price competitive market, with the majority of products selling for under \$100. According to Dennis, Ophir Optics benefits greatly from doing business in the state of Massachusetts. Many of Ophir's customers are located in Massachusetts, including Raytheon and Visual Aids Electronics (VAE). The fact that Massachusetts is home to a well-educated and highly skilled workforce provides an additional incentive for doing business in the state.

**Dennis Merrill** provided an overview of Thermo-Fisher Scientific and its activities in Massachusetts. Headquartered in Waltham, Thermo-Fisher has nine sites around the state, including Wilmington and Franklin. The company is involved in the placement of optics into a variety of products and deals mainly with lower volume applications with a higher price point. One of the main products that the company manufactures is a chemical identification system, which Dennis Merrill identified is a growing technology and a continuing trend in the industry.

One of the main advantages of doing business in Massachusetts is the availability of engineers and highly skilled workers in the state. Massachusetts is home to several high-level technical universities, but Merrill stated that collaboration and partnerships between the company and its surrounding universities could be improved. Another advantage to doing business in Massachusetts is the close vicinity of defense companies. Some of the challenges of working in Massachusetts are the relatively high cost of living, which impacts budgets and high overhead rates. There is a global competition for manufacturing, which also leads to certain issues with state and federal regulation.

**Karen Scammell** provided an overview of Axsun Technologies, which was founded in 1998 in Billerica and posted **\$30M in sales** last year. Axsun's core technology is the production of an optical toolkit of micro-lenses, laser technologies, and optical coating and these devices are the platform for OEM Optical Engines. Axsun is also involved in the production and design of a carpet identification device, which is sold as an end-user product. The company is involved in a variety of market segments, each with noticeable trends and factors driving demand:

- **Telecommunications:** there has been significant price pressure from Axsun's customers – large telecom equipment suppliers, including Nokia Siemens, Ericsson, Alcatel-Lucent and Huawei – causing Axsun to invest in modifications to existing technology to meet new requirements for higher bandwidth at lower manufacturing cost.
- **Medical Imaging:** demand is being driven by the aging population. Axsun has been involved in the production of optical coherence tomography (OCT) devices, used for retinal imaging to diagnose several eye-related issues and other emerging medical applications in endoscopy and skin cancer detection.

70% of Axsun's products are sold overseas, with China representing 50% of the market. Due to the technical complexity and relatively low volume of products, all production is done in Massachusetts. Karen reiterated the advantages of working in Massachusetts, mentioning the talented pool of engineers in the state. Axsun's parent corporation relocated to Billerica from San Antonio in order to recruit talent necessary to bring its product to market. Karen also stated that companies can greatly benefit from state grants for product development. Some potential downsides are the costs of rent and electricity, but these issues are not to the point of impacting business.

### **Selected Q & A**

- Q – There is high level of R&D talent in the state, but do you foresee any shortage in the future? What are some problems you have come across with finding local talent and skilled workers?
- A – (Karen) Although Massachusetts is home to several technical universities and highly skilled workers, one of the challenges has been finding individuals with regulatory and program management experience.

(Dennis Merrill) It is at times difficult to find the right “fit” for a position. Thermo-Fisher Scientific searches for individuals with an entrepreneurial and creative mindset.

(Dennis Cope) Specialized fields may require more of a national search for talent and skilled workers.

Q – (Tom Dudley) What can universities do better to strengthen their partnerships with companies in the industry?

A – (Dennis Merrill) BU is a great example of a university with a world class photonics center that is open to different licensing models. Universities tend to have a strong licensing arm, which makes it difficult for companies to form partnerships because of the issues that arise with intellectual property rights for co-developed products.

(John Dexheimer) Many states have industry “clusters,” which are microcosms of companies and universities within the industry. Massachusetts can greatly benefit from an industry cluster in optics and photonics, because of the large number of universities in the state. An industry cluster would pull people together, provide networking forums, institute training programs at colleges, and attract companies to develop in the state.

Q – How can companies and the industry itself remain vibrant in the state of Massachusetts?

A – (Dennis Cope) Companies can remain vibrant by developing new concepts and increasing collaboration within the industry. Now that the military demand has decreased, firms should devote more of their focus to new programs in the commercial world. Massachusetts can also attract European offices because of the convenience of the state’s location in relation to Europe.  
(Dennis Merrill) Forecasting is a challenge in today’s world, with the uncertainty of military and commercial demand. With increased research and development, products like the chemical detectors and identification systems get smaller and more efficient, which decreases prices and opens up many avenues in the market.

#### **Attendees**

Steve St. Arnault	<i>Merrimack Valley EDC</i>
Jennifer Casasanto	<i>Harvard School of Engineering</i>
Thomas Dudley	<i>Boston University</i>
Mike Edward	<i>Grubb &amp; Ellis</i>
Bill Granchelli	<i>RBS Citizens Bank</i>
Fawwaz Habbal	<i>Harvard School of Engineering</i>
Joe Holland	<i>Eastern Bank</i>
Nick Masci	<i>Dacon Corporation</i>
George Nugent	<i>Grubb &amp; Ellis</i>
Kevin Quinn	<i>Dacon Corporation</i>
Kasey Russell	<i>Harvard School of Engineering</i>
Rich Ryan	<i>CBRB Relocation Services</i>
David Tibbetts	<i>Merrimack Valley EDC</i>

#### **MassEcon Staff**

Susan Houston  
Sean Getchell

#### **Ozzy Properties Staff**

Orit Goldstein  
Ellen Keller

A special thanks to Ozzy Properties for hosting this event.

