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**OSA**  
Executive  
Forum

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23 March 2015 • Los Angeles, CA, USA

Collocated with OFC

FEATURED SPEAKER:



**Jeff Cox**

*Sr. Director of Network  
Architecture, Microsoft*

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# **EXECUTIVE FORUM 2015**

## **The Premier Event for Leaders in Optical Networking and Communications**

Petree Hall  
Los Angeles, California, USA  
23 March 2015

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The 2015 Executive Forum, held in conjunction with OFC, provides industry executives with networking opportunities, insights, and analyses from the field's leading business and financial experts on tomorrow's trends and opportunities.

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### **TABLE OF CONTENTS**

|                              |    |
|------------------------------|----|
| Acknowledgments              | 2  |
| Agenda At-A-Glance           | 4  |
| Keynote Presentation         | 5  |
| Panel Discussions            | 6  |
| Fireside Chat                | 10 |
| Speaker and Company Profiles | 11 |

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- ❖ Bill Gartner, Vice President /General Manager, Cisco
- ❖ Eve Griliches, Director Solutions Marketing, *BTI Systems*
- ❖ Stephen Hardy, Editorial Director/Associate Publisher, *Lightwave*
- ❖ Tom Issenhuth, Optical Network Architect, *Microsoft*
- ❖ Chris Pfistner, Senior Director, Marketing, *Finisar*
- ❖ Gurinder Parhar, Director, Product Line Management, *Emcore*
- ❖ Natarajan 'Subu' Subrahmanyam, Senior Managing Director, *The Juda Group*

***Thank you to the dedicated committee for their time and efforts in developing an outstanding program.***

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***The 2015 Executive Forum is produced by OSA***

### **The Optical Society**

#### **About OSA**

Founded in 1916, The Optical Society (OSA) is the leading professional organization for scientists, engineers, students and entrepreneurs who fuel discoveries, shape real-life applications and accelerate achievements in the science of light. Through world-renowned publications, meetings and membership initiatives, OSA provides quality research, inspired interactions and dedicated resources for its extensive global network of optics and photonics experts. OSA is a founding partner of the National Photonics Initiative and the 2015 International Year of Light. For more information, visit [www.osa.org](http://www.osa.org).

## **AGENDA AT-A-GLANCE**

**23 March 2015**

|                      |   |
|----------------------|---|
| <i>07:00 – 12:00</i> | Registration  |
| <i>07:30 – 08:30</i> | Breakfast   |
| <i>08:30 – 08:45</i> | Welcome and Opening Remarks   |
| <i>08:45 – 09:30</i> | Featured Presentation: Jeff Cox, Sr. Director of Network Architecture, Microsoft        |
| <i>09:30 – 10:45</i> | Panel 1: Why the Data Center Requirement Needs a Different Approach                     |
| <i>10:45 – 11:00</i> | Coffee Break  |
| <i>11:00 – 12:15</i> | Panel 2: Global Perspective on the Future of Optical Communication                      |
| <i>12:15 – 13:30</i> | Networking Lunch  |
| <i>13:30 – 15:00</i> | Panel 3: Reshaping Standards for Today's Realities                                      |
| <i>15:00 – 15:30</i> | Coffee Break  |
| <i>15:30 – 16:45</i> | Panel 4: The New Drives for R&D Investment  |
| <i>16:45 – 17:50</i> | Fireside Chat: The Roadmap to Next-Gen Network Innovation – Financing Leaders Speak Out |
| <i>17:50</i>         | Closing Comments  |
| <i>18:00 – 19:30</i> | Networking Reception – Sponsored by: Picometrix   |

## **FEATURED PRESENTATION**

23 March 2015; 08:45 – 09:30

### **Moderator**

- ❖ Eve Griliches, Director Solutions Marketing, *BTI Systems*

### **Speaker**

- ❖ **Jeff Cox, Sr. Director Network Architecture, Microsoft**

### **Speaker Biography**

Jeffrey L. Cox leads the Architecture, Testing and Standards (ATS) team in Azure GNS whose focus is on developing future end-to-end network infrastructure architectures supporting all of Microsoft's online and cloud services.

For almost 30 years, Jeff has been involved in architecting, designing, and operating some of the largest scale network infrastructures ever built. Jeff has also led the development of hardware systems in the packet switching/optical transmission space, built datacenters, developed protocols, and has taught numerous networking courses.

Prior to joining Microsoft, Jeff was Director of Engineering in the Core Business Unit of Juniper Networks focusing on developing next-generation integrated packet-optical technologies at 100Gb/s and beyond. Prior to Juniper, Jeff was the Director of Research & Technology at BT (British Telecom) leading a group of over 100 researches investigating various networking technologies from physical infrastructure up through end-to-end network architectures. Prior to BT, Jeff was involved in network architecture at JP Morgan Chase focused on MPLS and optical network deployment.

For five years beginning in 2000, Jeff started Celion Networks, an optical DWDM transmission system company. Jeff was the Chief Systems Architect for the Celion systems and was responsible for overall product design of the systems. Prior to Celion, Jeff was Sr. Director of Global Data Architecture for Level(3) Communications and was responsible for overall end-to-end architecture for the various packet network infrastructures with a focus on Ethernet and MPLS technologies. For most of the 1990s, Jeff built large-scale enterprise networks for various large corporations. Jeff began his networking career in the 1980s at Texas A&M University where he was responsible for the campus academic computing centers and networking infrastructure..

### **About Microsoft**

Founded in 1975, Microsoft (Nasdaq "MSFT") is the worldwide leader in software, services, devices and solutions that help people and businesses realize their full potential.

## **PANEL DISCUSSIONS**

### **Panel 1: Why the Data Center Requirement Needs a Different Approach**

23 March 2015; 09:30 – 10:45

#### **Moderator**

- ❖ Natarajan 'Subu' Subrahmanyam, Senior Managing Director, *The Jada Group*

#### **Speakers**

- ❖ James Feger, Vice president, Network Strategy and Development, *CenturyLink*
- ❖ Mitch Fields, Product Strategy and Architecture, *Avago Technologies*
- ❖ Rao Lingampalli, Optical Network Architect in the CTO Group, *Equinix*
- ❖ Xuezhe Zheng, Director, Photonics, *Oracle Corporation*

#### **Panel Description**

Among service providers, colocation providers, Web 2.0 companies and large enterprises, data centers are set to drive massive investments in infrastructure over the next 3-5 years. What kind of new optical network architectures and optical modules will be triggered by the explosive growth in data center build outs and how will they contribute to the growth of next generation optical networks?

What will be the key requirements for optical equipment linking data centers vs the one providing the internal infrastructure? Will innovation and growth be primarily driven by the data center interconnect market including submarine links? Or will they come from inside the data centers as providers struggle with fiber management and increasing internal bandwidth demands? Are the internal optical requirements for data centers completely different or just new variations on the existing datacom requirements? How quickly will vendors be able to fulfill these requirements? Will CDN players help reduce the bandwidth needs or are they actually contributing to it? Come join in this exciting panel where industry executives will share their views on these key questions and more.



## Panel 2: Global Perspective on the Future of Optical Communication?

23 March 2015; 11:00 – 12:15

### Moderator

- ❖ TBD

### Speakers

- ❖ Yiran Ma, Engineer, *China Telecom*
- ❖ Juan Pedro, Project Manager, *Telefonica*
- ❖ Glenn Wellbrock, Director of Optical Transport Planning, *Verizon*

### Panel Description

Understanding capex spending patterns and adoption of next gen architectures in the telecom infrastructure industry today requires a truly global perspective - ubiquitous, reliable high speed wireline and wireless connectivity is becoming a worldwide requirement and we are seeing carriers across the world invest in innovative solutions to satisfy this requirement. This panel focuses on understanding perspectives from global Tier 1 carriers on several key topics in communications infrastructure including i) key innovations carriers are implementing today or expecting from their vendors over the next couple of years; ii) evolving network traffic patterns and investment priorities in the transport network – 100G, long haul/metro, packet/optical; iii) role of SDN/NFV in carrier networks; iv) how is the move to cloud progressing and what is the impact on DC builds and carrier networks? Executives from global Tier 1 carriers will share their insights on these topics.

## Panel 3: Reshaping Standards for Today's Realities

23 March 2015; 13:30 – 15:00

### Moderator

- ❖ Bill Gartner, Vice President/General Manager, *Cisco*

### Speakers

- ❖ Najam Ahmad, Director, Network Engineering, *Facebook*
- ❖ Joe Berthold, Vice President of Network Architecture, *Ciena*
- ❖ John D'Ambrosia, Chief Ethernet Evangelist, *Dell*
- ❖ Cedric Lam, Engineering Director, Google Fiber Platforms, *Google*
- ❖ Randy Nicklas, Executive Vice President and Chief Technology Officer, *Windstream Communications*

### Panel Description

Standards bodies, many of them, exist today to ensure interoperability between hardware vendors and to leverage early designs to standardize on a single approach in order to reach volume shipments that will ultimately deliver lower product pricing. However, non-standard hardware deployments are being deployed by many of the newer network operators today. What is driving the non-standard approach, and will it eclipse the standards bodies or be a temporary solution that only improves time to market?

## Panel 4: The New Drivers for R&D Investment

23 March 2015; 15:30 – 16:45

### Moderator

- ❖ Chris Pfistner, Senior Director, Marketing, *Finisar*

### Speakers

- ❖ Brandon Collings, Chief Technology Officer, Communications and Consumer Optical Products, *JDSU*
- ❖ Osa Mok, Chief Marketing Officer, *InnoLight Technology Corporation*
- ❖ Rajiv Ramaswami, Executive Vice President & General Manager, Infrastructure and Networking Group, *Broadcom*
- ❖ Julie Sheridan Eng, Senior Vice President of Transceiver Engineering, *Finisar*

### Panel Description

Innovations at the optical and electrical component level, such as optical layer innovations (e.g. FlexSpectrum ROADMs), and different forms of photonic integration (PIC) and digital signal processing (DSP) in coherent detection, have been key enablers for significant performance advancements in optical networking. This panel focuses on areas of investment, research and development for leading component vendors across i) different network segments including datacenter, access, metro/edge and ULH; ii) technology choices such as single mode optics versus multimode optics or InP based integration versus silicon photonics; iii) standards & MSA based developments vs proprietary products. In this panel, executives from key suppliers in the industry will share their views on these topics and more.

## **Fireside Chat: The Roadmap to Next-Gen Network Innovation – Financing Leaders Speak Out**

23 March 2015; 16:45 – 17:50

### **Moderator**

- ❖ John Dexheimer, President, *Lightwave Advisors, Inc.*

### **Speaker**

- ❖ Hamid Arabzadeh, Founder/Funder of *Ranovus*, former CEO at *CoreOptics* (sold to *CISCO* in 2010), and angel investor (through *Purple Angel* and *Spoke Technologies*)
- ❖ Doug Busch, Vice President and General Manager, Fiber Optic Products, *Molex*
- ❖ Andrew Rickman, Founder, CEO and Chairman, *Rockley Photonics, Inc.*
- ❖ Nikos Theodosopoulos, *NT Advisors, LLC*

### **Session Description**

Where is investor capital flowing now and in the next several years? Get the insights of active investors that have helped create and fund the early ramp of some of the most innovative, high growth firms in the industry over the past 20 years--firms that have become the underpinnings of broadband infrastructure and the optical portfolios of Cisco, Ciena, Google, Broadcom, Motorola, Verizon, Intel, Mellanox, Oclaro and JDSU. Some of the questions they will be addressing are: 1) Where are the opportunities that they now have placed bets on and why? 2) Where are they advising portfolio firms to focus--in emerging technologies and firms or in large scale roll-outs? and 3) What are the next technical and market opportunities that interest them?

## **SPEAKER AND COMPANY PROFILES**

### **Najam Ahmad, Director Network Engineering, Facebook**

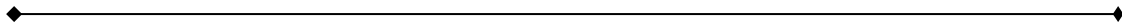
A director of engineering at Facebook, Najam Ahmad oversees all aspects of the development and operation of a global network infrastructure that serves more than a billion people around the world.

Prior to joining Facebook, Najam was the general manager of global networking services at Microsoft. In that role, he was responsible for the overall architecture, implementation, and operations of Microsoft's global online network. Najam's other experience includes management and engineering roles at MCI/UUNET and Netrix Corporation.

Najam holds an MS in telecommunication protocols and computer science from The George Washington University and a BE in Electrical Engineering from the NED University of Engineering and Technology.

### **About Facebook**

Founded in 2004, Facebook's mission is to make the world more open and connected. People use Facebook to stay connected with friends and family, to discover what's going on in the world, and to share and express what matters to them.



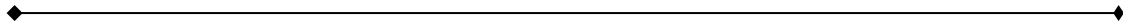
### **Hamid Arabzadeh, Founder/Funder of Ranovus, former CEO at CoreOptics (sold to CISCO in 2010), and angel investor (through Purple Angel and Spoke Technologies)**

Hamid Arabzadeh is an Information Technology and Telecommunication start-up executive with investment, operational and board level experience building market-leading businesses. He was the Chairman, President and CEO of CoreOptics (acquired by CISCO in 2010), a leading provider of 10/40/100Gbps DSPs and optical subsystems for high-speed networking applications in IT and Telecom. Previously, he held various management positions at Nortel Networks in Mexico, Brazil, England and Canada. He was VP & GM of Metro Optical with business responsibilities for SDH, DWDM (Cambrian Acquisition) and Multiservice OM6500 (Viking platform). Hamid holds a B.A.Sc. from University of Waterloo in Electrical and Computer Engineering and an MBA from McGill University in Strategic Management. In 2014 RANOVUS Inc., as a provider of multi-terabit interconnect solutions for datacenter and communications networks, completed a \$24 million round of financing lead by T-Venture, the Venture Capital Company of Deutsche Telekom and Azure Capital, an investment team that as investment bankers lead many of the major IPOs and M&A in the optical and internet infrastructure sector over the past 20 years.

### **About Ranovus**

RANOVUS is a solution provider for next generation interconnects for the telecommunications and information technology industries. RANOVUS' current disruptive portfolio includes Quantum Dot Multi-Wavelength Laser technology and advanced digital and photonics

integrated circuit technologies that are setting a new industry benchmark for the next generation of optical interconnect solutions.

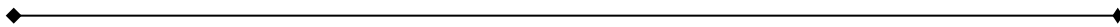


**Joseph Berthold**, *Vice President, Network Architecture, Office of the CTO, Ciena*

Joseph Berthold is Vice President, Network Architecture, in the Office of the CTO at Ciena, where he has worked since 1997. There he contributes to the understanding of future network architecture directions, the definition of CIENA's networking products, and is responsible for coordination of CIENA's work in industry standards. He is a Fellow of the IEEE. He is a member of the Board of Directors of ATIS (Alliance for Telecommunications Industry Solutions). He has been a long-term contributor to the Optical Fiber Communications Conference and currently supports its long range planning activity. He held a number of leadership positions in the Optical Internetworking Forum from 1998-2006, including 5 years as member of the Board of Directors and President. Prior to Ciena he held various research and development positions at Bell Labs and Bellcore from 1977-1997. He received a PhD in Physics from Brown University in 1976, and did postdoctoral research at Cornell University from 1975-1977.

**About Ciena**

Ciena is the network specialist. We collaborate with customers worldwide to unlock the strategic potential of their networks and fundamentally change the way they perform and compete. Ciena leverages its deep expertise in packet and optical networking and distributed software automation to deliver solutions in alignment with its OP<sup>n</sup> architecture for next-generation networks. We enable a high-scale, programmable infrastructure that can be controlled and adapted by network-level applications, and provide open interfaces to coordinate computing, storage and network resources in a unified, virtualized environment.



**Doug Busch**, *Vice President and General Manager, Fiber Optic Products, Molex*

Doug Busch has served as Vice President, General Manager of Molex's Optical Solutions Group since 2009. He leads the team that is responsible for the overall strategy, technology development, business development and operations for Molex's Optical business globally.

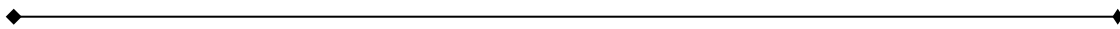
In his 21st year with the company, Doug has served in a variety of positions of progressive responsibility including Sales, Product Marketing, Product Development, Sales Management, Global Account Management and General Management. In these roles, he has served in 3 of Molex's 4 major Divisions and has worked extensively with Molex's customers and employees around the world.

He serves in a variety of other roles in the company, including the Director & Manager Transformation Programs and as a member of the advisory board for Molex's Young Professionals Group. In each of his roles, his passion is to rally great people to fulfill the Molex vision and build effective, driven teams that deliver growth and innovation.

Married to Crystal and father of Claire and Jack, he invests his time outside of work coaching his kids in sports and life and serving in his church. He earned his undergraduate degree from Cornerstone University and his MBA from the University of Notre Dame.

### **About Molex**

Molex solves complex technical and business challenges for the world's innovators, by anticipating and delivering what our customers need most. From a globally integrated approach to collaboration, we bring people and technology together to help bring your product vision to reality. With manufacturing and design centers around the world, our operations work closely with yours to deliver results wherever you are — results that leverage our heritage of innovation in interconnect technology, and bring integration expertise to the complex electronic solutions of tomorrow.

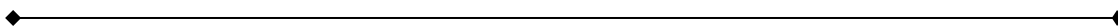


### **Brandon Collings**, *Chief Technology Officer, Communications and Consumer Optical Products, JDSU*

Brandon Collings is responsible for defining and driving the product and technology roadmaps and strategies for optical communications solutions at JDSU. Prior to JDSU, he held optical network design and development positions at Ciena and Internet Photonics, and was a Member of the Technical Staff at Bell Labs performing research on advanced optical communication network designs and non-linear performance impairments. He holds a Ph.D. from Princeton University in Electrical Engineering.

### **About JDSU**

JDSU (NASDAQ: JDSU) innovates and collaborates with customers to build and operate the highest-performing and highest-value networks in the world. Our diverse technology portfolio also fights counterfeiting and enables high-powered commercial lasers for a range of applications. Learn more about JDSU at [www.jdsu.com](http://www.jdsu.com) and follow us on JDSU Perspectives, Twitter, Facebook and LinkedIn.



### **John D'Ambrosia**, *Chief Ethernet Evangelist in the CTO Office of Dell*

John D'Ambrosia is the Chief Ethernet Evangelist in the CTO Office of Dell. For the past 15 years he has been an industry advocate for pushing Ethernet to ever increasing rates. Currently, he is chairing the IEEE P802.3bs 400GbE Task Force. Previously, D'Ambrosia chaired the IEEE 802.3ba Task Force that developed 40GbE and 100GbE that is being widely deployed today. D'Ambrosia's work is not limited to higher speeds, however, as he is a member of the IEEE 802 Executive Committee. Outside of standards development, he is the Chairman of the Ethernet Alliance, an organization dedicated to the promotion of all IEEE 802 Ethernet Technologies. In this role as well as an industry blogger, D'Ambrosia evangelizes all Ethernet technologies. For his role in developing Ethernet standards, D'Ambrosia was awarded the IEEE-SA 2013 Standards Medallion, as well as inducted as part of the 2013 class into the Light Reading Hall of Fame.

## About Dell

Dell empowers countries, communities, customers and people everywhere to use technology to realize their dreams. Customers trust us to deliver technology solutions that help them do and achieve more, whether they're at home, work, school or anywhere in their world.

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## **Julie Sheridan Eng**, *Senior Vice President of Transceiver Engineering, Finisar*

Julie Sheridan Eng is Senior Vice President of Transceiver Engineering for Finisar. She has held various senior management positions within Finisar's engineering organization since joining in 2003. From 1995 to 2003, Dr. Eng was part of AT&T/Lucent/Agere, primarily leading Agere's transmitter, receiver, and transceiver design for telecom and datacom markets. Dr. Eng holds a B.A. degree summa cum laude in Physics from Bryn Mawr College and a BSEE degree with Honors from the California Institute of Technology. She earned an MSEE and PhD in Electrical Engineering from Stanford University. She has published over a dozen papers and holds 7 patents.

## About Finisar

Finisar Corporation is a global technology leader in optical communications components and subsystems. These products enable high-speed voice, video and data communications for networking, storage, wireless, and cable TV applications. Over the past two decades, Finisar has provided critical breakthroughs in optics technologies and has supplied system manufacturers with the production volumes needed to meet the exploding demand for network bandwidth and storage. Finisar's industry-leading optical products include transceivers/transponders, active cables, WSS ROADMs, optical instruments, and active and passive components. In 2008, Finisar merged with Optium Corporation, creating the world's largest supplier of optical communication components and subsystems. The company now delivers the industry's broadest product portfolio backed by world-class quality and reliability. Finisar's vertically integrated business model is ideally suited for delivering massive production volumes while providing ready access to most of the critical technologies needed to develop the next generation of products.

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## **James Feger**, *VP Network Strategy and Development, CenturyLink*

Vice President of Network Strategy and Development James Feger currently oversees CenturyLink's overall network strategy and evolution. His responsibilities include standards, architecture, labs, product development and all other aspects of the CenturyLink network. Through his leadership, the Network Strategy and Development organization evolves the CenturyLink network to facilitate the continued growth and enablement of the company's vast product offerings.

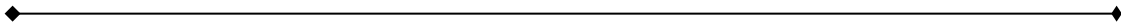
Feger had a leading role in the creation of CenturyTel's LightCore network and the integration of both the CenturyTel and Embarq and CenturyLink and Qwest networks.

With more than 19 years of industry experience, Feger has held several technical and leadership roles throughout his career. Prior to joining CenturyLink, Feger worked for AT&T.



## **About CenturyLink**

CenturyLink is the third largest telecommunications company in the United States and is recognized as a leader in the network services market by technology industry analyst firms. The Company is a global leader in cloud infrastructure and hosted IT solutions for enterprise customers. CenturyLink provides data, voice and managed services in local, national and select international markets through its high-quality advanced fiber optic network and multiple data centers for businesses and consumers. The company also offers advanced entertainment services under the CenturyLink® Prism™ TV and DIRECTV brands. Headquartered in Monroe, La., CenturyLink is an S&P 500 company and is included among the Fortune 500 list of America's largest corporations.



### **Mitchell Field**, *Senior Director of Product Marketing and Strategy, Fiber Optics Products Division, Avago Technologies*

Dr. Mitchell Fields is the Senior Director of Product Marketing and Strategy for Avago Technologies' Fiber Optics Products Division. He and his team have responsibility for promoting Avago's fiber optic portfolio and driving collaboration activities with industry partners, for establishing Division's technology and product roadmap, and for interfacing to standards and MSA organizations. With over 14 years of experience in the fiber-optic industry, Dr. Fields has presented multiple invited and contributed talks and participated in multiple workshops and panels at conferences around the world addressing poignant topics on fiber optics communications. Prior to joining Avago in 2005, Dr. Fields held research and architecture positions at MIT Lincoln Laboratory and Sycamore Networks. He has a B.S. in Mathematics from SUNY Binghamton and a Ph. D. in Physics from Yale.

## **About Avago Technologies**

Avago Technologies is a leading designer, developer and global supplier of a broad range of analog, digital, mixed signal and optoelectronics components and subsystems with a focus in III-V compound semiconductor design and processing. Backed by an extensive portfolio of intellectual property, Avago products serve four primary target markets: wireless communications, wired infrastructure, enterprise storage, and industrial and other. Applications for our products in these target markets include cellular phones and base stations, data networking, storage and telecommunications equipment, factory automation, power generation and alternative energy systems, and displays. The Fiber Optics Products Division is one of the world's largest suppliers of fiber optic components serving FTTH, Access, Storage, Data Center, Enterprise, Routing, Ethernet Switching, and Long Haul markets.



### **Juan Pedro Fernández-Palacios Giménez**, *Project Manager, Telefónica*

Juan Pedro Fernández-Palacios Giménez received the MS in Telecommunications Engineering from Polytechnic University of Valencia in 2000. In Sept. of 2000 he joined Telefónica I+D where he is currently leading the Core Network Evolution unit within Telefónica Global Chief Technical Office (GCTO). His responsibilities within Telefónica GCTO include the coordination of the innovation activities on transport networks, the definition of Technical

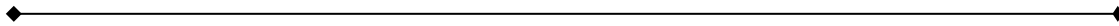
Guidelines for IP and DWDM transport networks in Telefónica Group and the specification of technical requirements in Telefónica global transport procurement processes. Currently, he is coordinating the European FP7 project IDEALIST (<http://www.ict-idealists.eu/>) focused on the development of elastic optical networks.

### **About Telefónica**

Telefónica is one of the largest telecommunications companies in the world in terms of market capitalization and number of customers. From this outstanding position in the industry, and with its mobile, fixed and broadband businesses as the key drivers of its growth, Telefónica has focused its strategy on becoming a leading company in the digital world.

The company has a significant presence in 25 countries and a customer base that amounts more than 309 million accesses around the world. Telefónica has a strong presence in Spain, Europe and Latin America, where the company focuses an important part of its growth strategy.

Telefónica is a 100% listed company, with more than 1.5 million direct shareholders. Its share capital currently comprises 4.551.024.586 ordinary shares traded on the Spanish Stock Market (Madrid, Barcelona, Bilbao and Valencia) and on those in London, New York, Lima, and Buenos Aires.



### **Cedric Lam, Engineering Director, Google Fiber Platforms, Google**

Cedric F. Lam is currently Director of Engineering at Google. He manages the Platforms Group of Google Fiber to develop scalable and cost-effective next generation FTTH technologies to fulfill Google's mission of deploying 1 Gb/s access to broadband customer. Before joining Google, Dr. Lam was Chief System Architect at Opvista which made ultra-high density WDM transport systems. Prior to Opvista, Dr. Lam was Senior Technical Staff Member at AT&T Labs, Broadband Access Research Department. Dr. Lam has a PhD from UCLA and B. Eng. (First Class Honors) from University of Hong Kong, both in Electrical Engineering. His current interests include broadband access network architectures, technologies, and datacenter networking.

### **About Google**

Google Fiber starts with a connection that is up to 100 times faster than today's average broadband speeds. Instant downloads. Crystal clear high definition TV. And endless possibilities.



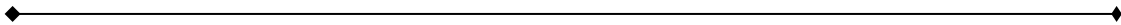
### **Rao Lingampalli, Optical Network Architect, Equinix, Inc.**

Rao Lingampalli is the Optical Network Architect at Equinix. His current role is network architecture and solutions development for inside and outside fiber plant including DWDM transport and switching systems and optical layer SDN for Equinix global data center networks. He has nearly 25 years of experience in optical and data network technologies, systems, networks, and services. His past experience includes R&D, systems engineering, technical sales and marketing, and product/program management at telecom service providers

(MCI/WorldCom now part of Verizon) and optical system vendors (Ciena, Fujitsu, and Calient Networks). He has about sixteen conference and trade journal publications to his credit in several optical technologies and networks. He holds Master of Engineering in Electrical Engineering from Stevens Institute of Technology with fiber optical communications specialization.

### **About Equinix**

Equinix, Inc. provides data center services to protect and connect the information assets for the enterprises, financial services companies, and content and network providers primarily in the Americas, Europe, the Middle East, Africa, and the Asia-Pacific. It connects companies directly to their customers and partners in networked data centers through the Equinix interconnection platform. The company provides colocation services and related offerings, including operations space, storage space, cabinets, and power for customers' colocation needs; interconnection services comprising physical cross connect/direct interconnections, Equinix Cloud Exchange, Equinix Internet Exchange, Equinix Metro Connect, Internet connectivity services, and Ethernet exchange services; and managed IT infrastructure services, including installation of customer equipment and cabling, as well as equipment rebooting and power cycling, card swapping, and emergency equipment replacement services. It connects approximately 4,500 companies, which comprise cloud and IT services providers, content providers, financial companies, global enterprises, carriers, and mobility and other bandwidth providers. Equinix, Inc. was founded in 1998 and is headquartered in Redwood City, California.



### **Yiran Ma, Engineer, China Telecom**

Yiran Ma, Ph.D, graduated from The University of Melbourne then joined China Telecom Co. Ltd. Beijing Research Institute. Now he is responsible for standardization, planning, technology innovation of transport and access network in China Telecom. His main interest includes 100G and beyond 100G, transport SDN and NG-PON2.

### **About China Telecom**

China Telecom group was founded in 2000 with annual revenues of 65 billion US dollars. China telecom is one of the three leading telecom operators in China, ranked 182th of the Fortune Global Top 500 in 2013. As a comprehensive information service provider, China Telecom provides integrated information solutions including mobile, broadband Internet access, ICT services and fixed line telephone, etc. China Telecom has branches in 31 domestic provinces, Asia-Pacific, Europe and North America. China Telecom has the world's largest broadband network and huge customer resource. By the end of 2014, there are more than 100 million broadband Internet subscribers, 186 million mobile subscribers and 144 million fixed line telephone subscribers.



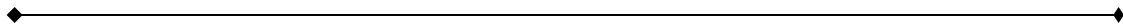
**Osa C.S. Mok, Co-founder and Chief Marketing Officer of InnoLight Technology Corp.**

Mr. Mok is an international marketing executive in the Telecommunications Industry with over thirty years of experience in both Fortune 500 and start-up companies. He joined Hambrecht and Quist (now JP Morgan Chase) in the early 1980's as a Communications Technology Analyst. From 1985 to 1992, he was Director of International Marketing for GTE (now Verizon). He won outstanding sales achievement awards and received several President's quality awards for distinguished management achievements. From 1993 to 1999, he worked as an International Business Development Executive assisting several Fortune 500 companies to develop communications business in Asia and South America. Mr. Mok co-founded Pine Photonics, an optical transceiver startup, in April 2000. He grew the company significantly despite a severe industry downturn and sold the company to Opnext in 2003. In 2008, Mr. Mok co-founded InnoLight Technology Corporation. In just 6 years, InnoLight has successfully become a leader in 40G data center business for optical transceivers and has sales presence in all major continents of the world. Mr. Mok received a MBA degree from University of Santa Clara, and a M.S. from Texas A&M University.

**About InnoLight**

InnoLight Technology Corporation designs, builds and markets high speed optical transceivers that enable rapid bandwidth expansion of the cloud computing market. Our solutions offer superior technical performance, compelling value proposition, and time to market advantage that are critical for the sustaining growth of next generation data centers.

InnoLight was founded in April 2008 and now has over 1,000 employees. Headquartered in Suzhou, China, InnoLight has sale offices and R&D centers in China, the US, and Taiwan. Customers include major Web 2.0 cloud operators, tier-one equipment OEMs, and leading system integrators in North America, Europe, and Asia.



**Randy Nicklas, Executive Vice President – Engineering & Chief Technology Officer**

Randy Nicklas is executive vice president of engineering and chief technology officer for Windstream. Nicklas is responsible for network planning and engineering, outside plant, records and capital management.

Prior to joining Windstream in May 2013, Nicklas was senior vice president of engineering and chief technology officer for XO Communications. He had previously held engineering and technical management positions at Intelsat, Cisco, and MCI. He has also worked in the areas of software development and systems engineering on a variety of aerospace programs for NASA, Los Alamos National Laboratory and Computer Sciences Corporation. Nicklas holds bachelor's and master's degrees in applied mathematics and a master's degree in physics, all from the Georgia Institute of Technology.

**About Windstream**

Windstream Corp. (Nasdaq: WIN), a FORTUNE 500 and S&P 500 company, is a leading provider of advanced network communications, including cloud computing and managed

services, to businesses nationwide. The company also offers broadband, phone and digital TV services to consumers primarily in rural areas.



**Rajiv Ramaswami**, *Executive Vice President and General Manager, Broadcom*

Rajiv Ramaswami serves as Broadcom's Executive Vice President and General Manager of the Infrastructure & Networking Group (ING). In this role, he is responsible for all Ethernet controller, switching and physical layer products, optical solutions, storage products, security and embedded processors. ING's products and technologies are targeted at enterprise, service provider and data center markets. Products offered by this group include Ethernet controllers for notebooks, desktops and servers, physical layer devices for copper, optical and microwave links, switches and embedded processors for Layer 2 to Layer 7 switches, routers and security appliances — equipment that delivers and manages the flow of voice, video and data services within and across networks.

Mr. Ramaswami joined Broadcom in 2010 after serving as Vice President and General Manager of the Cloud Services and Switching Technology Group at Cisco Systems, Inc., where he also served as Vice President and General Manager for a variety of business units in Optical, Switching and Storage Networking.

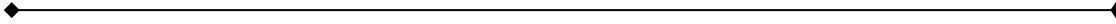
Prior to joining Cisco, he served in various technical and leadership positions at Xros, Tellabs and IBM's T.J. Watson Research Center.

Mr. Ramaswami holds M.S. and Ph.D. degrees in Electrical Engineering from the University of California, Berkeley and a B. Tech. degree from the Indian Institute of Technology in Madras. He holds 34 U.S. patents primarily in optical networking and has coauthored a textbook, "Optical Networks: A Practical Perspective." He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and a Distinguished Alumnus of the Indian Institute of Technology.

**About Broadcom**

Broadcom Corporation provides semiconductor solutions for wired and wireless communications. Its products offer voice, video, data, and multimedia connectivity in the home, office, and mobile environments. The company operates in three segments: Broadband Communications, Mobile and Wireless, and Infrastructure and Networking. The Broadband Communications segment offers cable, satellite, IP, and terrestrial set-top boxes that enable service providers to deploy a range of features and services for consumers; DSL, cable, and fiber broadband access services; and wireless infrastructure solutions, such as femtocell to enhance cellular coverage and small cell low-powered radio access nodes. The Mobile and Wireless segment provides low-power, high-performance, and highly integrated solutions, including Wi-Fi and bluetooth, near field communications, wireless connectivity combo chips, and cellular SoCs, as well as location-based technologies and touch controllers. The Infrastructure and Networking segment offers Ethernet switching products for service provider networks, data center implementations, and enterprise and small-and-medium businesses; communication processors and wireless infrastructure, such as multicore communication processors, knowledge-based processors, and microwave modems and RF; Ethernet

controllers; and a range of custom application-specific integrated circuit solutions. The company markets and sells its products through direct sales force, distributors, and manufacturer's representatives in the United States; and through regional offices, as well as a network of independent and fulfillment distributors, and representatives primarily in Asia, Australia, Europe, and North America. Broadcom Corporation was founded in 1991 and is headquartered in Irvine, California.



**Andrew Rickman**, *Founder, CEO and Chairman, Rockley Photonics, Inc.*

Dr Andrew Rickman OBE is the founder, CEO and Chairman of Rockley Photonics based in the UK and Pasadena, CA. Rockley Photonics is a rapidly expanding company, formed with an experienced team of colleagues to develop novel optical communication systems and build on the success of previous technology ventures.

Andrew was previously the founder, CEO and Chairman of Bookham Inc. (now called Oclaro Inc. [NASDAQ: OCLR]) one of the world's largest fiber optics telecom component producer headquartered in San Jose, CA, USA. Andrew founded Bookham in 1988 and grew the company from a start-up to a FTSE100 company as CEO and latterly chaired the business through the consolidation of the telecoms industry.

More recently he was Chairman of Kotura Inc., a leader in the field of silicon photonics for fiber optic communications, high performance computing and sensing applications and was instrumental in its development and ultimately successful sale to Mellanox® Technologies, Ltd. (NASDAQ: MLNX; TASE: MLNX), a leading supplier of end-to-end interconnect solutions for servers and storage systems, for \$82 million on 15 August 2013.

Andrew has a mechanical engineering degree from Imperial College, London; a PhD in silicon photonics from Surrey University, an MBA from Cranfield University and honorary doctorates from Surrey, Edinburgh Napier and Kingston Universities. He is a chartered engineer and a Fellow of the Royal Academy of Engineering and the Institute of Physics.

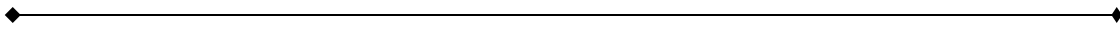
He was awarded an OBE in the Queen's Millennium Honors list for services to the telecommunications industry and is a winner of the prestigious Royal Academy of Engineering Silver medal for his outstanding contribution to British Engineering.

In 2000, Andrew was named UK's Technology and Communications Entrepreneur of the Year by Ernst and Young. In 2011, Andrew was awarded an Honorary Professorship at SIMIT, Chinese Academy of Sciences. Andrew has held advisory board positions with the East Asia Institute of the University of Cambridge and Applied Science and Technology Research Institute of Hong Kong. He was a Trustee of The Oxford Trust. He was previously a council member of the UK Government's Engineering and Physical Sciences Research Council (EPSRC).

**About Rockley Photonics**

Rockley Photonics was founded in August 2013 by an experienced management team with success in commercializing silicon photonics. Chairman and CEO, Dr Andrew Rickman, previously founded Bookham Technology in the UK and more recently acted as Chairman of

Kotura Inc. With offices in Oxford, UK and Pasadena, California, USA, the company has a fabless silicon photonics model and is developing novel optical communication systems.

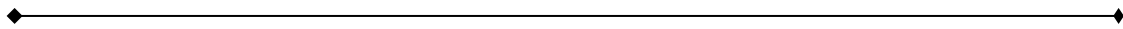


**Nikos Theodosopoulos, Founder, NT Advisors, LLC**

Nikos Theodosopoulos has 30 years of experience in the communications and finance industries and currently runs his own advisory and consulting practice, NT Advisors LLC. Previously, Nikos was a Managing Director at UBS Investment Research for 17 years where he served as Senior Research Analyst in the communications and networking industries, Global Technology Strategist and U.S. Technology Sector Head. His coverage included all the major optical networking component and communications systems firms. Nikos was voted to the All-American Team by Institutional Investor Magazine in 15 different years. He began his career at Bell Laboratories and AT&T where he held roles in engineering, project management and sales. He holds an MBA from New York University, an MS from Stanford University and a BS from Columbia University. Nikos is a member of the NY Angels, on the Columbia Engineering Entrepreneurship Advisory Board, on the board of Arista Networks and is the Chairman of the Supervisory Board of Adva Optical Networking.

**About NT Advisors**

NT Advisors LLC is a consulting firm focused on serving companies in the Technology, Venture Capital and Private Equity Industries. NT Advisors LLC was founded by Nikos Theodosopoulos in September of 2012. Since inception, NT Advisors LLC has provided consulting, independent board member and advisory board services to companies and financial institutions ranging from early stage technology start-ups to companies with annual revenues ranging from \$100 million to multiple billions. NT Advisors LLC has worked with clients primarily in the following areas: Investor Positioning, Corporate Strategy, M&A Vetting and Positioning, and Business Alliances.



**Glenn Wellbrock, Director of Optical Transport Planning, Verizon**

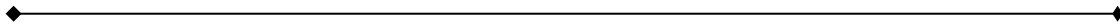
Glenn Wellbrock is the director of optical transport network architecture, design and planning at Verizon, where he is responsible for the development and deployment of new technologies for both the metro and long haul transport infrastructure.

Prior to this position, Wellbrock ran the advanced technology lab, established evaluation criteria and set engineering guidelines for all backbone transport equipment as well as various positions within network operations.

In addition to his more than 20 years at Verizon (1984-2001 and 2004-present), Wellbrock was responsible for product architecture within the U.S. optical networks group at Marconi and product planning at Qplus Networks with a specific focus on developing alternative modulation techniques.

## About Verizon

Verizon, headquartered in New York, is a global leader in delivering broadband and other wireless and wireline communications services to consumer, business, government and wholesale customers. Verizon Wireless operates America's most reliable wireless network, with more than 106 million retail connections nationwide. Verizon also provides converged communications, information and entertainment services over America's most advanced fiber-optic network, and delivers integrated business solutions to customers in more than 150 countries. A Dow 30 company with more than \$120 billion in 2013 revenues, Verizon employs a diverse workforce of 178,500. For more information, visit [www.verizon.com/news/](http://www.verizon.com/news/).



## **Xuezhe Zheng**, *Photonics Director, Oracle*

Xuezhe Zheng received the B.S., M.S. and Ph.D. degrees in optical instruments from Tsinghua University, Beijing, China in 1993 and 1997, respectively. He is currently a Photonics Director with the Netra System and Networking Group of Oracle after 3 years of research work in Oracle Labs as a Sr. Consulting Member of Technical Staff. Previously, he was with Sun Microsystems as a Senior Staff Engineer, working on advanced optical interconnects. Prior to that he was a manager of optical engineering at Calient Networks Incorporated, San Jose, CA, developing 3D MEMs based photonic switching products and applications in wavelength division multiplexing (WDM) networks. He has extensive experiences in photonic switching and optical cross-connect, fiber-optic components, dense wavelength division multiplexing (DWDM) optical networks, and optical interconnections. His current research interests are in WDM Si photonics for advanced inter/intra-chip interconnects.

Dr. Zheng is a recipient of the Science and Technology Development Award from the National Education Committee of China. He has author/coauthored more than 150 papers in technical journals and conferences and he holds 45 U.S. patents.

## About Oracle

Oracle Corporation develops, manufactures, markets, hosts, and supports database and middleware software, application software, cloud infrastructure, hardware systems, and related services worldwide. It provides software and hardware systems, and related services to manage their cloud-based or on-premise IT environments, as well as to deploy cloud software-as-a-service, platform-as-a-service, and infrastructure-as-a-service. The company offers software for mobile computing; database and middleware software that runs and manages business applications for midsize businesses and large enterprises; and Java, a software development language. It also provides applications software, such as human capital and talent management, customer experience and customer relationship management, financial management and governance, risk and compliance, procurement, project portfolio management, supply chain management, business analytics and enterprise performance management, and industry-specific applications software; and virtual machine instance, hardware and related support, and software and hardware management and maintenance services. In addition, the company offers customers with rights to software product upgrades and maintenance releases; patches released; and Internet access to technical content, as well as Internet and telephone access to technical support personnel. Further, it provides servers,



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storage, networking, virtualization software, operating systems, and management software to support various IT environments; and hardware systems support solutions, such as software updates for the software components. Additionally, the company offers consulting services, such as IT strategy alignment, enterprise architecture planning and design, initial product implementation and integration, and ongoing product enhancement and upgrade; customer support services; and education services. Oracle Corporation was founded in 1977 and is headquartered in Redwood City, California.



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