



***Workshop on Optical Startups
- 10 Years After the Bubble***

***Thursday, March 10, 2011
11:00 a.m. - 12:15 p.m.
Expo Theater II***



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It looks as if, 10 years after the bubble, fiber optics is still a very dynamic space with an amazing amount of new technology much of which is coming from startups. This workshop aims to discuss the current state of venture capital and photonic startups from a number of perspectives, such as from an investor, from an acquirer, and from young as well as mature startups. The workshop will feature a number of presentations that focus on insights and key lessons learned and will conclude with a panel discussion that leaves ample room for questions.

Moderator/Organizer

Erik Pennings, GM and Principal, 7 Pennies Consulting

Speakers/Panelists

Simon Poole, Director New Business Ventures, Finisar Australia

Salam El-Ahmadi, Founder & CTO, Menara Networks

Milton Chang, Managing Director, Incubic

Yves LeMaitre, Executive VP of Strategy and Corporate Development, Oclaro

Andreas Umbach, CEO, u²t Photonics AG



Handouts sponsored by a financial contribution
from Menara Networks, 7 Pennies Consulting, and Oclaro



Moderator/Organizer

Erik Pennings, GM and Principal, 7 Pennies Consulting




Erik Pennings started his career in R&D working at Bellcore (now Telcordia) and at Royal Philips Electronics where he pioneered several optoelectronic components and during which time he published around 70 papers. In 1995, he moved to sales and marketing at Philips Optoelectronics, where he was responsible for the business development for WDM lasers, tunable lasers, and high-speed EML's. Partly as a result of the growth that was achieved, Philips sold this business unit in 1998 to JDSU for well over \$1 billion. Dr. Pennings continued his career being responsible for sales and marketing at ThreeFive Photonics, which grew through a number of mergers into ASIP, then into Apogee Photonics, and finally into CyOptics. During this time, he grew revenues by 50% or more each quarter. In 2007, Dr. Pennings joined Eudyna Devices Inc. where he was responsible for marketing in the U.S. In 2009, Dr. Pennings started his own consulting company (www.7pennies.com) specializing in sales, marketing, and business development. He is working with high-tech startups as well as large corporations in order to grow their business and/or by providing targeted advice. Dr. Pennings has a M.S. in Physics (cum laude) from Groningen University, a Ph.D. (distinction) from Delft University of Technology, and an executive MBA from the Simon Business School in Rochester.

OFC Startup Workshop


March 10, 2011




Role of startups in photonics...

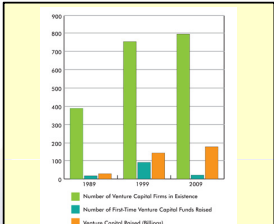


- Similar startup workshops held at ECOC 2001/02/03
 - At the peak of the bubble, interest in startups was obvious
- So in 2011, ten years after the bubble, question is:
 - Is there a fundamental need for photonic startups?
- However:
 - Economists (e.g. Schumpeter) believe in fundamental churn
 - There are always entrepreneurs that like to start companies
 - The “American” dream, i.e. to be the next HP, Intel, Google, ...
 - Maybe startups are fundamental for (high-tech) change
 - In 40G, there are Stratalight, Mintera, Core Optics, U2T, etc
 - In 100G, there is yet another generation of startups

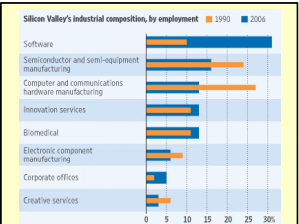
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The investment climate changed






May there is just as much VC...



But it goes to different areas...

- For photonics, question is which areas are attractive
 - Silicon photonics, 100G, FTTH networks...?

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Workshop contents



- Five distinguished speakers:
 - Simon Poole (Finisar)
 - Salam El-Ahmadi (Menara)
 - Milton Chang (Incubic)
 - Yves LeMaitre (Oclaro)
 - Andreas Umbach (u²t)
- Panel session
- Please note:
 - There are printed handouts
 - If you want a softcopy, please leave your business card
 - If you like to discuss more, please stay afterward

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Thanks!

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Speaker/Panelist

Simon Poole, Director New Business Ventures, Finisar Australia



Dr Simon Poole is an engineer, innovator and entrepreneur with over 30 years experience in communications and photonics technologies in academia and industry. As a researcher he was a member of the team at Southampton University in the UK that, in 1986, invented the Erbium-Doped Fibre Amplifier (EDFA). In 1988, Simon moved to Australia where he was a founder of the Optical Fibre Technology Centre (OFTC) at Sydney University and also of the Australian Photonics CRC.

He is Australia's leading entrepreneur in the area of optical communications, having personally founded and sold two extremely successful photonics companies, Indx and Engana, and being closely involved in many others.

Engana developed LCoS-based Wavelength Selective Switching (WSS) technologies, and in 2006 was acquired by Optium Corporation (now Finisar) for \$US43million. Finisar Australia is now located in Waterloo focusing on the development and manufacturing of WSS-based products.

As Director, New Business Ventures, of Finisar Australia Dr Poole is now leading an internal start-up to expand Finisar Australia's core activities into the field of Optical Instrumentation.

Dr Poole is a Fellow of the IEEE.

What would make someone buy your company?

Area	Why	Indx/Uniphase (1997)	Engana/Optium (2006)
Portfolio Gap	"Is this a product/technology we don't currently have?"	Uniphase = Lasers, LiNbO ₃ Indx = FBG	Optium = Transceivers Engana = WSS
Technology Maturity	"We're not interested in developing new technology..."	Already shipping submarine-qualified gratings to Japanese customer	Prototypes with multiple customers. Starting to build out manufacturing
Cultural Fit	Important but not essential	West Coast US = Australia	East Coast US ≠ Australia
People	"Do we trust them?"	Existing relationship between Indx CEO/Uniphase CTO.	Existing relationships between CEOs, investors. Companies worked together in sales channel prior to acquisition
Valuation	Realistic	\$6m on revenues of \$1m	\$42m pre-revenue

*Fiber Optic Solutions
for High-Speed Networks*

Thank you



Speaker/Panelist

Salam El-Ahmadi, Founder & CTO, Menara Networks



Salam Elahmadi received his Ph.D. in electrical engineering from Southern Methodist University, Dallas, Texas , in 2009. From 1995 to 2003, he was an R&D manager with Nortel Networks where he led various wireless system integration projects. From 1999 to 2002, he was a project leader with Qtera (later acquired by Nortel) where he contributed to the development of ultralong haul WDM systems. In 2004, He co-founded Menara Networks where he led ASIC and Transceiver development teams as the company's chief technology officer. Dr Elahmadi, has more than 16 years of experience in design, test, and deployment of various wireline and wireless communications systems. His background includes in-depth knowledge of signal-processing techniques, digital communication theory, nonlinear fiber optics, and high-speed electronics. He holds numerous patents and has authored several peer reviewed publications.

Startup Workshop

Salam Elahmadi
Founder & CTO

OFC/NFOEC 2011



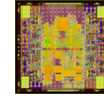
OFC/NFOEC 2011

Menara - What we're about ...

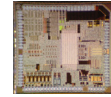
- A VC-backed startup found in 2004
- Headquartered in Dallas, TX
- Employs about 30+ employees
- Designs, manufactures, and deploys high-end distortion tolerant optical transceivers
- Successful launch of unique solutions, deployed worldwide



World's 1st and only 10G OTN Pluggables



World's 1st and only serial 12G OTN transceiver ASIC



Best-in-class 400km 12G EDC
World's first 12G Analog FRML ASIC



My Encounter with the Startup World

- First happened when I joined Qtera in 99
- Left the slowly-moving corporate world of Nortel where
- Going from problem identification and/or market definitions to problem resolution and/or product deployment could take months/years
- To a fast-pace environment where
- speed & accuracy is the name of the game
 - available cash is extremely limited & pressure for 3-5 year ROI is intense
 - Development cycle substantially reduced
 - Unique never-designed-before products must be designed, tested and deployed in 2-3 years
 - Qtera had to deploy novel ULH systems within 2 years vs. Established system vendors (Nortel, others) have been working on similar solution (even less-performing) for years.
 - Menara shrunk entire Transponders into a small-form-factor XFP pluggable (slightly bigger than a USB dongle)
 - Team productivity dramatically higher
 - the size of the entire company (including R&D, production, ops, sales&marketing, etc...) less than that of Nortel's "Documentation department"
 - Laser-like focus on execution
 - startups benefits, as opposed to bigger corporations, from 1-product-at-a-time mentality



My Recommendations

- Experience is necessary but ...Vision & leadership matters even more - Why?
 - Experience often acts a "low-pass filter" of entrepreneurs disruptive solutions
 - Experience resists paradigm-shift necessary for innovation
- Entrepreneurs should rely on their instinct & vision to define disruptive solutions free of "experienced judgment", then ...
 - Draw from experience & expertise to augment their vision with a laser-like focus on execution
- Flatten your organization as much as possible
 - eliminate unnecessary hierarchy
- create efficient junior-engineer-to-executive channel of communications
- Veer away from micromanaging, dress-code, and strict work schedules -
 - they kill motivation & hurt productivity
 - There are other ways of assessing employees performance & maintaining professional attitude
- Always have a back-up plan
 - Designing industry-first products is no trivial matter and has risks
 - A similar, less ambitious solution should be considered in parallel
 - ideally re-utilizing as much as possible from "ideas" & resources of the more-ambitious solution. Also serves to increase your portfolio



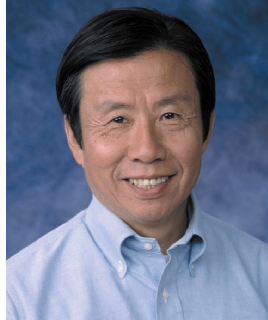
Startups Impact

- Staunch drivers for innovation
 - Technology that empowers the internet, mobile phones, display, green energy, biomed, automotive, etc ...
- Main cause of existence of about \$20+ billion of VC money annually injected in the economy
- Huge job creators
 - Startups and small businesses have generated 60 to 80 percent of net new jobs annually over the last decade.
- Unlike "financial innovation", startups high-tech innovations directly contribute to growth of world economies and thus to the well-being of society
 - In the startup world, the phrase "greed is good" is a true statement.



Speaker/Panelist

Milton Chang, Managing Director, Incubic



Milton Chang is Managing Director of Incubic Management and is semi-retired. He was CEO and President of Newport Corporation and New Focus, both of which he took public. He was also actively involved in founding a number of startup companies, six of which went public. He has been writing a monthly business/career column for the Laser Focus World for more than 15 years and is completing a book titled, “Towards Entrepreneurship—Lowering The Risk of Starting and Running a Technology Business.”

Milton is a Fellow of the IEEE, Laser Institute of America (LIA), and Optical Society of America. He was past president of LIA and the Photonics Society of the IEEE. He has received a number of awards, including Distinguished Alumni Award from Caltech and the University of Illinois. Also, Milton is a Caltech Trustee and member of the Committee of 100. Currently, he currently sits on the board of Precision Photonics and mBio.

Towards Entrepreneurship

Lowering the risk of Starting Company

OFC 2011
Panel

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Backdrop

- Laser is 50, opportunities are abundant, business competes on muscle and execution, financing is challenge, IPO hurdle is high.

INCUBIC

A dream startup scenario

- Find a “hot” idea
- Take the plunge
- Get VC funding to get going
- Develop the business quickly to gain first-mover advantage
- Get to a big exit in a short time

INCUBIC

But...

- A typical VC funds about 1% of the business plans and less than 50% of the investments succeed
- Many startup companies with good ideas and valuable technology languish because they start off on the wrong foot

INCUBIC

Capital Efficiency Is A Necessary Condition

- An entrepreneur by definition is a person who uses resources effectively to create value.
- Translation: To succeed, a business must create value efficiently in order to provide its investors and stakeholders an attractive return

INCUBIC

Stating the obvious...

- Technological competitive advantage is a necessary BUT insufficient condition.
- Find a business idea you can succeed at... make a business case... take into considerations of the opportunity, environment, resource availability, AND your ability and level of commitment...decide on a business approach and set realistic goals... get adequate resources from the right investor...and be prepared to work!

INCUBIC

Most Business Can Be Built Over time

Launch a niche business within your field of expertise and grow it over time

- You'll have industry insider insight and expertise to provide built-in competitive advantages
- Initial capital required for a niche business is low
- You can manage a niche business by using common sense and gain experience as you go
- Growth is low-risk with a loyal customer base & is capital efficient using existing infrastructure
- You can raise money at an attractive valuation when you encounter a big opportunity

INCUBIC

Hot Product with narrow market window

Develop the business in logical steps to avoid haste-makes-waste mistakes. Instead of betting on assumptions, first develop a prototype business

- Verify assumptions to refine strategy before making a major commitment: Technology, customer response, market size, strategy, organization...Everything.
- Make some sales
- You may then decide to build out the company quickly, develop the business over time, or to work towards an acquisition

INCUBIC

A Tale of Two Startups

- Jim and Janet Baker founded Dragon System, a speech recognition company in 1982...Acquired in year 2000 with 350 employees...whereas all other high-flying startup companies in this field failed.
- Segway, the personal transporter startup burnt \$150M of investor money.

INCUBIC

Advocating Early Acquisition

An early acquisition is good for all involved:

For the company

- Stakeholders get a higher ROI without taking further risks because a (verified*) dream can get you as much as reality

For the acquiring company

- A cost capital efficient way to pursue new products

For the Photonics industry

- Growing photonics companies = stronger photonics industry

*Not likely to occur until you have a well proven prototype business...in the mean time focus on building a great business to keep your options open

INCUBIC

Take home message to think about...

- Be well prepared and proceed only when you have the capability to put in place *all* the necessary ingredients.
- ...and when you do start, strive for capital efficiency and ROI
 - Build a prototype business to verify the market potential, and then proceed with an appropriate model.
 - Start a niche business within your field of expertise and grow the business over time to lower risk
 - Work towards an early acquisition

INCUBIC

INCUBIC | venture capital

Milton Chang
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Speaker/Panelist

Yves LeMaitre, Executive VP of Strategy and Corporate Development, Oclaro



Yves LeMaitre has been with Oclaro since February 2008. Before being appointed to his current position, he was Executive Vice President and General Manager of the Company's Advanced Photonic Solutions Division. Prior to joining Oclaro, Yves was with Avanex Corporation, most recently serving as Chief Marketing Officer in charge of worldwide sales and marketing. Previously, he was President and Chief Executive Officer of Lightconnect, a leading supplier of optical MEMS components and modules. In addition, Yves worked for Alcatel and its joint venture with Sprint International in a variety of general management, senior marketing and engineering positions in the United States, France, the Netherlands and Italy. Yves earned a master's degree in mathematics and computer science from Nantes University in France. He also holds an engineering degree from Ecole Nationale Supérieure des Telecommunications (ENST) in Paris.

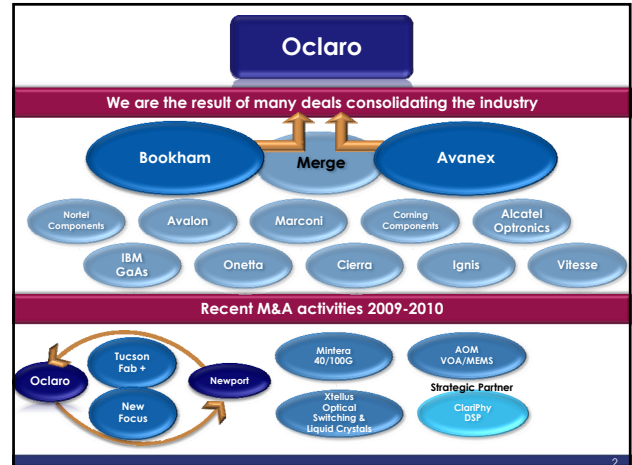
oclaro™

Shining light on photonic innovation

OFC Workshop on Optical Startups: 10 Years After the Bubble

Yves LeMaitre
EVP, Strategy and Corporate Development

MARCH 2011



Optics is an exciting world ... **oclaro**

... with so many opportunities for startups

Telecom	Datacom & Optical Interconnect	Laser Beam Applications
Total \$3B	Total \$2B	Total \$1B
FIBER		BEAM

The Perspective of a Potential Acquirer **oclaro**

Bubble era born startups	<ul style="list-style-type: none"> Limited exit options (IPO unlikely, few buyers) Tired VC base closing year 2000/2004 funds Turning into slightly profitable small/mid size businesses Focused on few products/niches...high risk exposure
New startups	<ul style="list-style-type: none"> Lack of support from VC...needs to change Most exciting areas in optics (photonics integration, consumer lasers, high speed transmission) require significant funding to bring product to market Lots of technology incubation, few real companies
Deal making	<ul style="list-style-type: none"> Mature industry, well defined multiples, less speculative Few buyers operating within rigid valuation brackets Diverging interest of VCs vs. management
Post-deal integration	<ul style="list-style-type: none"> Plan before you act People, people, people...


Speaker/Panelist

Andreas Umbach, CEO, u²t Photonics AG




Andreas Umbach is the CEO and co-founder of u2t Photonics AG, leading supplier for ultrafast devices for optical fiber communications. Today the company based in Berlin, Germany; employs 150 people. Andreas Umbach was born in October 1961 in Offenbach/Main, Germany. He studied physics at Technische Hochschule Darmstadt and at Technische Universität Berlin, where he received his Dipl. Phys. degree. His studies concentrated on applied solid state physics. His diploma thesis was carried out at the Fraunhofer Institut für Mikrostruktur-Technologie on the spatial resolution of scanning Auger microscopy. In 1989 he joins the Heinrich-Hertz-Institut in Berlin. His work in the department of microfabrication technology concentrated on design and technology of HEMTs and high-speed integrated photodetectors.

u²t – from Start-Up to Market Leader



why keep her waiting?
innovating faster

Andreas Umbach
Workshop on Optical Startups, March 10th, OFC 2011, Los Angeles, CA.



u²t – at a glance



- Based on technology spun out from world renowned Heinrich-Hertz-Institut (HHI) in Berlin in 1998
- ... by 3 physicists:
 - Andreas Umbach
 - Günter Unterbörsh
 - Dirk Trommer
- Privately owned – no Venture Capital funding
- Facilities:
 - InP based Receivers: Berlin
 - GaAs based Modulators: UK
- ISO9001:2008 certified and customer approved
- Market leaders in 40G and 100G receivers
- Profitable, continuing record of fast growth





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Keys to Success – Best Practice



- Know and build-upon your strengths
no me-too strategy

u²t as a case study:

- Core skills:
 - design and development of optoelectronic devices on InP
 - rf-design, packaging and test expertise
 - application know-how of advanced optical fiber communications
 - excellent network with key customers of high-data rate systems


→ Well differentiated portfolio of leading-edge ultrafast optoelectronic components:



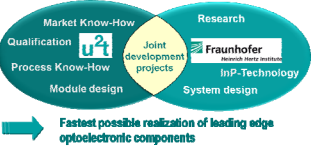
100GHz Photodetectors 40G Photoreceivers Integrated Receivers GaAs Modulators

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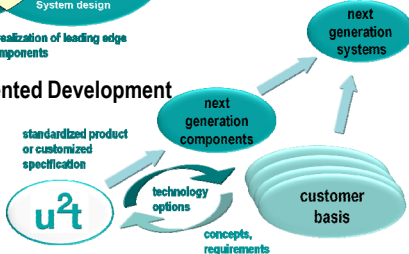
Innovation Partnerships



- Co-operative Research with the Academic Community



- Customer-oriented Development



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Keys to Success




- Know and build-upon your strengths
no me-too strategy
- Identify (and foster) the right partners:
 - Customers, who really want your product
 - Technology providers, who are really leading-edge
 - Suppliers, who appreciate your (starting) business
 - Investors, who share your vision and ideals (in good times and in bad times)
 - Team members, who are infected by your dreams

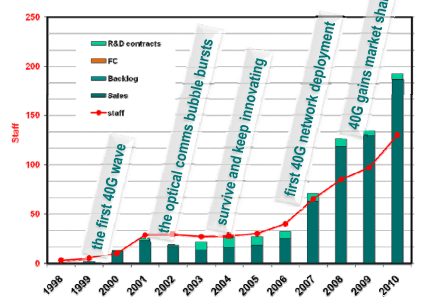




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A Strong Growing Business



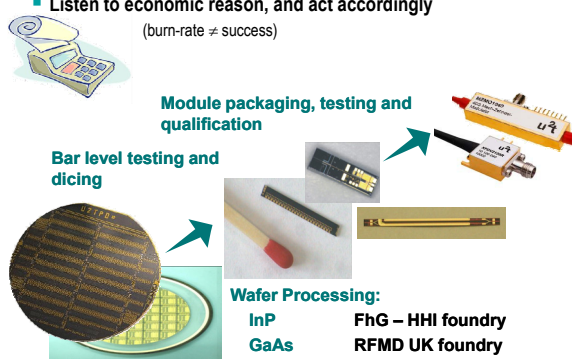
- Quite some stamina is required – not only financially (or should we call it stubbornness?)

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Vertically Integrated, but Fabless

- Listen to economic reason, and act accordingly (burn-rate \neq success)
 - Module packaging, testing and qualification
 - Bar level testing and dicing
 - Wafer Processing:
 - InP
 - GaAs
 - FhG – HHI foundry
 - RFMD UK foundry



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Keys to Success

- Know and build-upon your strengths (no me-too strategy)
- Identify (and foster) the right partners:
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 - Team members, who are infected by your dreams
- Quite some stamina is required – not only financially (or should we call it stubbornness?)
- Listen to economic reason, and act accordingly (burn-rate \neq success)

Good luck! You will still need it ...



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Optical Start-Ups, 1998 and 2011

Is today the right environment for optical start-ups? A set of critical questions:

- Strong growing markets?**
 - the bandwidth demand drives it all
 - today even more accepted to be sustainable
- Need for innovative solutions?**
 - 1998: the first 40G-hype, pioneers were required
 - 2011: 100G accepted as everybody's target, but what about the capacity-crunch?
- Do customers accept start-up suppliers?**
 - Market entry conditions more difficult today in a more consolidated industry
- What are the return-on-invest prospects for investors?**
 - How is innovation paid for across the value chain?
 - Cost is the major challenge to solve the carriers' dilemma, can start-ups really help solving that?
 - Profitably, with RoI of 10x?
 - At least, the financial markets finally appreciate our industry again

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Summary – Optical Start-ups 2011

- The market is still expanding very rapidly
- Innovation is needed, but how to finance it throughout the value chain?
- Can component vendors solutions really solve the carriers' challenge?
- Profitable business operations are a requirement for RoI perspective - no more tech hypes

→ Start-ups still have a chance with a well differentiated technology and skill set

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u²t – from Start-Up to Market Leader

Summary

- u²t at a glance – some key facts
- Keys to Success
 - "how to run an optical technology start-up": best practice guidelines
- Optical Start-Ups, 1998 and 2011
 - Is today the right environment for optical start-ups?
 - A set of critical questions

Thank you for your attention!

For further information please review:
www.u2t.com
 or contact me: umbach@u2t.de

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