The **Tech Sector Previews** set the scene for the leading-edge **Tech Sector Summits** hosted as part of the European Investment Forum, Copenhagen Nov 4-5. Three Summits will be hosted, bringing together leading companies and investors driving the present and the future of these sectors….

# TECH Sector SUMMIT *Previews*

The European Investment FORUM

The **Tech Sector Summits** are organised as part of The **European Investment Forum**

Copenhagen • **4-5 NOVEMBER 2002** • Hilton Airport Hotel

www.e-unlimited.com/sectorsummit **Register now!**

Published by TechnologyFinance

## Tech Sector Summit Preview
# Semi-Conductors & Optical Components

**The Tech Sector Previews * Setting the Scene for the Tech Sector Summits * COPENHAGEN * 4-5 NOVEMBER 2002….**

**Summit 1: Semi-Conductors & Optical Components**
**Summit 2: Business Application Software**
**Summit 3: Network Systems & Applications**

**Active in one of these Sectors as an entrepreneur, investor or specialist ?**
**Don't miss this leading investment and intelligence-sharing platform….**
**To register, goto: www.e-unlimited.com/sectorsummit**

For other SECTOR PREVIEWS featuring
- Business Application Software
- Network Systems & Applications

goto: www.e-unlimited.com/sectorsummit

Organised by

Europe Unlimited
*Connecting Entrepreneurs & Capital*

EUROPE unlimited

Supported by

Information Society Technologies

Sponsors

PLATINUM

Ernst & Young

GOLD

euronext

MoFo

3i

Deutsche Venture Capital DVC

SILVER

KENNET VENTURE PARTNERS

CapMan

VÆKSTFONDEN

TVM

EUREKA

In association with

FIRST TUESDAY CZECH REPUBLIC

IESE

For more information: www.e-unlimited.com/sectorsummit

# Table of Contents



**Features:**

**Investors seek action on telecoms edge**
VCs are hungry for the right chip startups, especially those cooking up technologies outside the telecoms realm. For the optical components industry they have a longer term approach - but are still backing companies from certain hotter sector areas. Pages 2-4

**Bumper round for CoreOptics**
For the latest financing news on the optical components and semiconductor sectors turn to *pages 4-7*



# Investors seek action on telecoms edge

Venture capitalists are taking a long term approach to investment into the optical components industry - but that does not mean they are not willing to back the right business through the current telecoms slump. For the semiconductor industry, especially those developing technologies outside the telecoms realm, investors are much more optimistic and see exciting potential in the startup sector.

**More positive about semiconductors**

Both Apax Partners and Carlyle Europe expressed their enthusiasm for the semiconductor sectors – especially those businesses that are not tied solely to the telecoms industry.
Apax's Christian Reitberger claims to be looking closely at investing in a number of semiconductor industry plays at the moment. He commented on being particularly interested in manufacturers of leading edge fab equipment, though he suggested Europe has more opportunities in fabless semiconductor application developers. One recent Apax investment, **Wisair** from Israel, develops chipsets with ultra wideband spectrum. A low power bluetooth succession technology. The firm is aiming to revolutionise the wireless home entertainment communications market. Reitberger said: "The major factor is time. Small companies have the advantage of speed of execution, but this first mover advantage will disappear if they can not make the most of it fairly quickly."
At Carlyle Europe, managing director Wolfgang Hanrieder said: "We are more actively looking at the semiconductor space…especially technology with a dramatic advantage that solves an existing problem in the industry, such as the low power capacity for mobile phones and headsets." A range of consumer goods described as exciting include wireless headsets, PDAs and wireless linked games. Hanrieder commented that he was particularly keen to target devices aimed at professional users who are becoming increasingly mobile and less and less wired.

**New optics investment for Carlyle**

Carlyle Europe may not be so optimistic in the short term for the optical components sector but it is still actively making late and early stage investments into the sector. Technology Finance can reveal that Carlyle is currently in the process of completing a new investment into **CubeOptics** of Germany. The startup, which has developed a manufacturing and packaging process that enables it to produce extremely small and highly flexible optical components the size of sugar cubes, is putting the final touches to a double digit millions of Euros round.

CubeOptics is a very different proposition to **OptoSpeed** of Switzerland, the other optics play Carlyle backed in a big way earlier in the year. Whereas OptoSpeed already claims a world market leading position in sales for its specific product area, CubeOptics is very much at the development phase. Hanrieder explained that for OptoSpeed the funding is to maintain its lead while the market is slow, whereas with CubeOptics the firm is being supported to solve new problems. The optics sector is still a fledgling market and Carlyle is backing both ends of the spectrum. Carlyle is actively syndicating with other players who are interested in this space. This strategy is also indicative of Carlyle's continuing efforts to balance its portfolio across geographies, sectors and stages.

**VCs will still back optics**

Carlyle may be the busiest late stage technology investor in Europe over the last 12 months, according to Technology Finance data, but it is not alone in backing the optics sector. Venture capitalists remain willing to back exciting new technology which has good management, and the optics sector is no exception.

On September 10 this year **CoreOptics** of Germany secured the biggest fundraising by a European optical components business for nine months, when it announced that it had raised an impressive US$21.5m in second-round funding. This was an internally led round with existing investors TVM and Crescendo stumping up the lion's share of the cash, but the confidence expressed was sufficient to bring in new investors, who were also attracted by an impressive management team. The previous largest round in this sector this year was the US$27.6m **Highwave Optical Technologies** of France raised in January. Other optical component startups that have received significant venture backing in 2002 include optical semiconductors developer **OptoSpeed** of Switzerland, (see above) which raised around E20m in a round led by Carlyle; **Lumentis** of Sweden, which bagged a E19m second round led by new strategic investor Santec, an optical component vendor based in Japan, and including existing investor Deutsche Bank Industrial; photonic switch developer **Polatis** of the UK, which secured US$8.4m in its second round funding led by new investor Prelude Trust**;** and **VertiLas** of Munich, which raised an undisclosed amount of funding from Equinet Venture Partners and High Tech Private Equity.

**COMPONENTS DIVISIONS FOR SALE**

In the US, publicly listed **Agere Systems** and **ADC Telecommunications**, as well as **Nortel Networks** of Canada, are all seeking buyers for their optical components units,

Bookham Technology bought Marconi's division, **Marconi Optical Components** (MOC), for £19.7m in an all-share deal in late 2001. *Lehman Brothers* advised Bookham and *Morgan Stanley* advised Marconi. The Management Buy Out (MBO) of **Alcatel Optronics Netherlands** took place in July 2002. The new entity, called C2V, is independently owned and financially supported by Dutch private equity firm Greenfield Capital Partners.

* Optical components player **Bookham Technology** sold its Canada-based R&D subsidiary, **Measurement Microsystems A-Z** (MM) to a company backed by former management of MM. Bookham has retained a 25% shareholding in MM and will continue to use MM's patented opto-electronic technology. *Lehman Brothers* advised Bookham's last sale.

**A four year plan**

These investors are unlikely to be expecting any of their chickens to hatch any time soon. There has been a massive decline in demand from telecoms operators for optical components in the past 18 months, and predicting an upturn is not easy.

Carlyle's Hanrieder feels the optical sector will take several years before it can benefit from the whole telecom space recovering in terms of spending on new systems. His prediction of developments for the systems sector is: "2003 will see some new technology initiatives but not much overall activity and in 2004 there will start to be enquiries by systems operators for roll outs in 2006. They will go to systems vendors and give specifications for next generation roll outs, which will start the ball rolling for a two to three year cycle of development. Only in 2006 will operators be likely to go back to systems and actually expand them - and then at the edge but not at the core."

The component vendors have to design in to the new systems with some lead time relative to the systems vendors so they would be expected to follow this same cycle but one year earlier. Hanrieder added "I think that design ins of components into new systems need to happen next year to make this timeline for new systems realistic."

Hanrieder was quick to stress that this was a realistically optimistic view, emphasising that it could well be a lot longer. He said: "We don't think the sector is dead – it's just in a coma. Our strategy is to stay in the

game, because it will come back to life and we want to be in a position where we will have critical mass." As previously mentioned Carlyle has demonstrated this long term view with two investments in companies at very different ends of the development cycle. "These companies need backing from the financial community long term to survive because they cannot get the capital from the business community at this stage," said Hanrieder.
Christian Reitberger of **Apax Partners** is also concerned about the prospects for the telecoms-related optics market. "No one really knows the full picture so we have to take a very long term view of this landscape. We know it's pretty bad but it could be even tougher," he warned.
The industry is particularly wary that if there is a major collapse from one of the core equipment manufacturers, such as Lucent, Siemens or Nokia, then things could escalate. The knock-on effect for suppliers of optical components could be catastrophic. Reitberger stressed the need for startups to make sure they keep enough capital available to survive all eventualities.

**Steer clear of telecoms?**

Apax has not made any very new investments in the optics field of late but Reitberger is very positive about the firms already in its portfolio. These include **IPG Photonics**, which already claims to be the world's largest ultra high power fibre amplifiers supplier.
IPG is working in one of the worst market areas to be in at the moment but Reitberger says he is very happy with the amount of success they are still having. Reitberger puts this success down to the firm's ability to also manufacture equipment for industries outside of telecoms - such as the automotive industry. Reitberger stressed that the ability to make your product portfolio available for companies outside the telecoms industry is vital at the moment. It is true that even JDS Uniphase is quietly moving a large amount of its business away from telecoms. An increasing amount of optical product lines are also being aimed at the healthcare industry.

**The edge before the core**

In such a downtrodden market, investors are less likely to be looking for exceptionally forward thinking technology. "We have to choose who will be the winners in the next three years time but we don't believe there is room for a completely new technology at this stage. We believe [the winners] will be incrementally based on today's technology with added functionality," said Hanrieder. JDS Uniphase's products are all based on the first generation of products. Hanrieder is particularly bullish about technology operating "on the edge of the network, as opposed to the core, where we think carrier spending will resume first.
The other Apax company in the optical components space is **GWS Photonics**. It deploys tunable filter products in the access and metro segments in the market, an area which Reitberger is optimistic is still growing. It was suggested that consumer and enterprise activity on the edge of the network will need to mushroom before demand can feed growth on the backbone itself.

**Confidence in talent**

As a final word Reitberger expressed his belief in the talent in the industry as an overriding factor for confidence. "I'm still optimistic because if you sit with the many leading edge technology companies in this sector you gain a lot of confidence in their ability to come up with great new stuff. Capex may not increase for the next 4 years, but still many good people don't want to work for big companies, and it would surprise me greatly if these businesses did not create something very successful.

## Semiconductors and Optics News

### Bumper round for CoreOptics

**CoreOptics** of Germany bagged the biggest fundraising by a European optical components business in 2002, by hauling in US$21.5m in second-round funding.
This was an internally led round with existing investors TVM and Crescendo stumping up the lion's share of the cash, but the confidence expressed was sufficient to bring in new investors Switzerland-based Atila Ventures, which works out of a fund of around E200m, and Germany-based High Tech Private Equity, which operates from a fund of around E150m. The new investors are though to have brought in close to US$5m new cash in each and were attracted by an impressive management team. *Edwards & Angel* provided legal advice to CoreOptics.
CoreOptics raised the cash from Crescendo Ventures, TVM Techno Venture Management, Atila Ventures, High Tech Private Equity and an unnamed North American corporation
The valuation has not been disclosed. CoreOptics' first round private placement raised US$15m from Crescendo Ventures, TVM, European Venture Partners, Fujitsu Quantum Devices of Tokyo and the German government.
CoreOptics said that European Venture Partners contribution to the first round was through a form of venture leasing and was consequently not expected to participate in this round. The German government fund also did not get involved again because its fund is focused on early stage investing only.
CoreOptics produces 10-gigabit and 40-gigabit transponders subsystems which claim to enable reductions in size, power consumption and cost while improving the performance of network equipment for long-haul distances in metro and transport networks.
Competitors include US-based Big Bear Networks, which itself raised a second round of US$40m led by Austin Ventures and Menlo Ventures earlier this year.

### CSFB closes in on bumper Bluetooth round

Cambridge based Bluetooth chip company **Cambridge Silicon Radio** (CSR) is believed to be close to completing a £25m private placement, with a large US VC coming in as a new lead investor. *CSFB*, which has also worked on previous CSR financing rounds, is believed to be advising.

Technology Finance reported that CSR would need to raise fresh finance before the end of 2002 back in October. CSR has raised over US$70m in three private rounds so far. Investors include Sony, Compaq, Philips, Intel, ARM, ALPS, 3I, Amadeus Capital Partners, Capital Research, Mustang Ventures, Razorfish, Wavecom, Virata , Gilde and Yasuda Enterprise of Japan.

The company has grown to around 200 people and has offices in the UK, US, Japan, Singapore and Denmark. CSR also has sales representatives across Europe, Asia and the US. (www.csr.com)

### Acuid prepares new private round

Edinburgh-based chip technology developer **Acuid** is believed to be looking to raise a second round of private equity funding. A source outside the company suggested that the firm's last round, which raised US$8m in May 2001 from HgCapital (formerly Mercury Private Equity), valued the business at around US$50m.

Acuid is developing a chip to chip communication technology which claims to be ten times faster than existing technologies. The cash from the last round was largely used to establish a second design centre in Scotland and the firm remains very much focused on IP development. Stewart Goudie, chief engineer of the UK design centre, said: "PCs are currently being restricted in their performance of data transfer rates and we can boost this by a factor of ten" The company claims to be able to facilitate the implementation of 10 gigabit communications systems far more cheaply than current technologies.

Acuid is about to manufacture its first demonstrator chip and claims to have a number of communication companies showing interest in its products. Goudie said that there are no direct competitors to the product at this stage adding "We expect most prospective competitors to be our customers."

Acuid started out as a management buy-out of a design facility in 1996. Mosaid became a trade investor in Acuid in June 2000. The firm now has 70 employees, a large number of which are located in St Petersburg. Acuid also generates some revenues from its low cost solutions for automatic testing equipment for memory chips, although Goudie said that this was only around 10% of the business' focus.

Hans Rohrer, formerly president of TSMC Europe, was appointed president and CEO of Acuid in March of this year. (www.acuid.com)

### Chips sales climb

The worldwide semiconductor manufacturing industry is on track for between 7% and 9% sequential growth in sales for the third quarter of this year according to statistics from the Semiconductor Industry Association.

Global semiconductor sales increased by 8% in July, the first year-on-year jump since February 2001. The July growth, which was strongest in Japan and Asia, was driven mainly by consumer electronics with particularly high demand for new wireless devices.

### Teem negotiates on, makes buy

**Teem Photonics** is still being advised by *CSFB* on a significant private placement. The bank has been trying to put the deal together for over 18 months with a number of rumours surfacing around its imminent completion. However sources close to the deal say a lead investor is in place and there is confidence that the deal will get done.

The startup demonstrated its own confidence in August by snapping up the intellectual property of its former competitor Northstar Photonics Inc of the US for an undisclosed amount of cash. Northstar is still operational "for tax reasons," says James MacKenzie, VP of business development and marketing for Teem Photonics, but will wind down its activity soon.

A spin-off from Schneider Electric in 1998, Teem develops erbium doped waveguide amplifiers (EDWA). It has been shipping components and modules since 1999. The Northstar acquisition strengthens Teem's patent base. Other startups developing EDWA technology are Cisilias, Inplane Photonics, Molecular OptoElectronics Corp (MOEC) and Redfern Integrated Optics.

### Intense placing for optics firm

Integrated optical components developer **Intense Photonics** of Scotland secured a US$16m series B funding round led by Cazenove Private Equity. A syndicate containing first round investors, 3i and ACT Venture Capital, together with two further European venture capital funds, FNI Venture Capital and TTP Ventures also chipped in. The valuation of the round was not released although the company is now majority-owned by its institutional backers.

Intense claims the new cash will be sufficient to take the business through to profitability in 2004. It will use the funds to accelerate the development of its product range and strengthen its marketing effort. Large scale shipping of its devices is expected to begin by next summer.

Intense Photonics has a fully operational semiconductor fabrication facility and produces multi-function optical chips. (www.intensephotonics.com)

### Intune lights up with second round

Ireland-based **Intune Technologies**, which develops test and calibration applications, and specialised optical sub-systems, has completed a second financing round of E3m led by ICC Venture Capital and including existing investor Enterprise Ireland and new investors. *Merrion Corporate Finance* provided Intune with financial advice and *A&L Goodbody* was legal counsel.
Intune was spun out of University College Dublin and raised its first round of around E2.8m from Enterprise Ireland and 3i in December 2000 at a reported valuation of around E11m.
The new funds will be used to accelerate sales and marketing efforts in Europe and the US. Component manufacturers such as JDS Uniphase and Lucent Technologies are being targeted. (www.intune-technologies.com)

### Alpha Mosaic seeks new late stage investor

Alpha Mosaic will be opening a new round looking to raise E10-12m in Q4 this year. The Cambridge, UK-based business has the backing of current early stage investors Prelude Technology Trust, ACT Ventures and TTP, but the company also wants to find larger investors who can help it out with the exorbitant costs of semiconductor production.
Alpha Mosaic specialises in integrated circuits for the mobile video market, CEO Jalal Bagherli accepts that the whole semiconductor market is depressed at the moment but believes signs of recovery will start to show in the next twelve months. The current climate affects the larger companies more than the smaller ones according to Bagherli, and for a young company like Alpha Mosaic, still in the throes of developing its first project (manufacturing should start next month), the market could just pick up at the right time.
One of the main problems faced by the semiconductor industry is the vast amount of money required to access the latest technologies. If your area of interest is sub micron technology then only two or three foundries in the world will be of use, and these are based in Taiwan. Fabrication itself is phenomenally expensive, and if an error is made this can cost as much as US$1m immediately. Bagherli points out that this inhibits experimentation and is slowing down the industry - particularly as the technology involved becomes more complex.
There are no real solutions for those in Europe right now– some foundries do offer experimental runs on fabrication but these tend to be shared with other companies leaving little real room for experimentation. The CEO of Alpha Mosaic would be keen to see funding from the UK government for manufacturing, however, he admits that he is unaware of any plans in this direction, and went on to say that, in reality, there are no grounds for the government to shell out US$1m on chip experimentation.
Another very real threat looming over the European semiconductor industry, particularly related to mobile phones, is the speed of development in the Far East. Activity in the wireless market in Japan and Korea is much greater. Technology developments for third generation mobile phones in the Far East are up to two years ahead of those in Europe. Bagherli is concerned that if Europeans do not move quickly then they will face a serious challenge from their Asian competitors, already well versed in the art of 3G, when the phenomenon finally hits Europe.
Start ups in particular are struggling at the moment, as venture capitalists are looking for guaranteed return on investment before they commit to funding. The problem is, Bagherli says, that as a semiconductor company you have to make the chip to prove yourself before you can expect funding. Taking this gamble can be risky, as it is so expensive and does not guarantee results. And even if a phone company does take on your technology after an evaluation period that can last up to three months, then it can still be two years before the product is safely installed in a phone. Such drawn out timetables are the enemy of so many start-ups and methods of overcoming such obstacles must be found.

### Chip finance makes progress

**Communicant Semiconductors Technologies AG** is gradually rounding up the E1.5bn needed for its chip plant at Frankfurt/Oder. In June it finalised the equity portion, with E374m coming from Intel and the Dubai Airport Free Zone Authority, and E38m from a bank owned by the State of Brandenburg. The balance will come in grants and guarantees worth up to E300m from the Brandenburg and federal governments, supplier credits, and bank loans. *Commerzbank* and *Gulf International Bank* are working on a US$650m loan, which will have substantial risk cover from the German authorities. EU approval for the public sector support of the project is expected this autumn.
Production is scheduled to begin in the first half of 2004, employing 1,300 staff. The project will produce low energy chips developed and patented by the Frankfurt Institute for Semiconductor Technology (IHP).
Communicant is claimed to be the world' s first communication-focused, pure-play integrated circuits foundry serving the wireless, broad-band and high-performance markets. It offers advanced modular SiGe:C BiCMOS and CMOS process technologies for high-speed, low-power applications and single-chip solutions. (www.communicant.de)

* Semiconductor manufacturer **Infineon Technologies** is lining up a E750m revolving credit via *Bank of America Securities*, *Citigroup SSB* and *Commerzbank*. Infineon announced revenues for the quarter ended June 30, 2002 of E1.4bn, down 10% on the previous year, and an EBIT loss of E107m. Ericsson and Infineon also received

antitrust authority approval for the sale of Ericsson's chip business to the German company. In connection with the sale Ericsson received 27.5 million new Infineon shares. Forward sales arranged by *Citigroup SSB* ensure Ericsson will receive E300m.

#### NemeriX develops location service

**NemeriX**, a Lugano, Switzerland-based fabless semiconductor company, began operations in June (website still under construction), with its eyes on the global satellite location-based services market. While its technology is aimed mostly at tracking mobile terrestrial objects, NemeriX may develop other revenue streams. One which could be announced in September is a European Space Agency contract to develop a satellite-based receiver using NemeriX's low power technology.

Despite the fact that three of NemeriX's four founders earned PhD degrees at ETH Zurich, they chose to develop their idea outside the university's spin-off programme. The entrepreneurs were reluctant to give up their IPR to the university, explained president and CEO Norman Thompson, and therefore chose to be independent.

NemeriX recently closed a round of venture capital with Swiss institutions Atila Ventures Beratungs GmbH and Venture Incubators. The two funds took a majority of the capital. "We expect to need more funds in 2004," said Thompson.

His timetable is to demonstrate NemeriX's low-power GPS system solutions in the first quarter 2003, and to enter production in the third quarter. All manufacturing will be outsourced. The product includes hardware (RF, digital) and software.

"It's like GSM in the late 1980s. Everyone wondered if the equipment would work, and if we could make it small enough," said Thompson.

The market for such services will include consumer-oriented services (navigation etc). But Thompson feels the driver could be government-dictated applications such as congestion charging, and emergency services. Terrestrial location services will serve important markets, but advocates of GPS assert that wide area applications, and certainly marine and aerial applications, need satellite support.

A further argument in favour of GPS is that it is free at the point of use. Terrestrial location functionality must be paid for by mobile operators, and passed on to users.

Furthermore, many countries are likely to follow the USA's E9-1-1 Initiative, which obliges all mobile telephones to be built with GPS functionality that allows emergency services to track to location of callers (in the same way they already can with fixed line emergency calls). The service works via a SMS message sent from the handset announcing the location of the user. In Korea, mobile handsets are supplied with GPS functionality. This functionality, once installed, could support other services.

The GNSS (Global Navigation Satellite System) market is expected to have greater quality and resilience in coming years. The existing US military-run GPS, and the Russian Glonass networks are being upgraded, and they should be joined in 2005 by the EU/ESA's Galileo system. "There's every chance there will be three complete systems by 2010," said Thompson.

In the mobile telephone market, NemeriX's small size suggests to Thompson that it will participate by licensing its IP to manufacturers. However, another viable market should be tracking and locating people (children, grandparents) and goods in transit. Here NemeriX could work with firms like Siemens Datatrack in Europe and SnapTrack in the USA.

Thompson boasts 30 years of experience in the semiconductor industry including Plessey Semiconductors, of which 14 years were in VLSI technology. He has also been involved in several startups. His three co-founders and graduates of ETH Zurich are Dr Francesco Piazza, Dr Paolo Orsatti, and Dr Marco Cavadini. (www.nemerix.com)