



HAPPY NEW YEAR !

Dear readers,
The team at YOLE Développement would like to wish you a Happy New

Year. Micronews is now entering its third year of publication. The number of readers has increased constantly over the past two years. Several thousands of readers all over the world read it every month. Thanks to this success, you now have the possibility to advertise your products and services every month to a very focused community. The Microtechnology section has matured and the Nanotechnology section will develop along with the business. We are very pleased to announce our collaboration with the Institute of Nanotechnology in Scotland for this section. There is a lot of enthusiasm right now in our environment. 2004 seems to be "business promising" not only in America or Asia but also in Europe (the 2003 loser according to macro-economical figures) ! As a market analyst, I keep observing and now understand that, with effort, creativity and confidence, the sky is the limit.

Therefore, at the start of this new year, I can not help but remind you once more that there are infinite needs that need infinite ideas, investments and innovations to fulfill them. May your professional and personal projects come true and develop successfully in 2004 all over the world!

A VERY HAPPY NEW YEAR.

Pascal Boulon
Deputy manager
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EDITORIAL

MEMS

TRACIT Technologies secures first round funding of 2.5 M to speed up marketing of new products obtained by its layer transfer technology

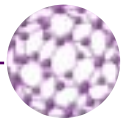
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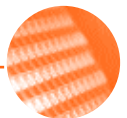
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Micronews is free of charge and available to you. Register online to have free access every month to Micronews at http://extranet.yole.fr/micronews/micronews_form.html



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The nanotechnology column is done in collaboration with the IoN. If you have some news that may be relevant to these columns, please contact Ottilia Saxl at the Institute, o.saxl@nano.org.uk

List of companies cited in "Micronews"

MEMS ComLab, Corning Intellisense, Coventor, CSEM, EV Group, Intellisense Software, Lionix, MEMSCAP, Micralyne, Phoenix, University of Neuchâtel, Wispry **NANO** Degussa, BASF, Volkswagen, NanoMaterials, Cerulean International Limited, Stagecoach, IBM, Infineon, Nanogen **OPTICS** Alcatel, Pirelli, ADVA, Koncent Communication, Shanghai Uniwave Technologies, Fujian Sandgy Optronics, Fuzhou Microlattice Semiconductor, DuPont Photonics, Palomar Technologies, WSI, Aixtron, Infonetics Research, CIR, CIENA, Corning, FastWeb, Honeywell, ULM Photonics GmbH, Mitsubishi **BIO** Advion BioSciences, Affymetrix, Allegro Technologies, Applied Biosystems, Cantion, Cepheid, CIPHERGEN, Debiotech, DNA Chip Research, Exiqon, GE Medical Systems, Gyros, Hitachi Software Engineering, Integrated DNA Technologies, MWG Biotech, Nanotype, North Carolina State University, Protiveris, SMC, Swiss Medical Care, Sophion Biosciences, The Alimentary Pharmabiotic Centre, University College Cork, Ireland **SEMICONDUCTORS** AMO, ASML, ASML Masktools, Austriamicrosystems, Communicant, ESEC, EV Group, Filtronic, FSA, IMEC, Infineon, Intel, MEDEA+, Photonics, Rasco, Seika, SEZ, SIA, Soitec, ST Microelectronics, Suss Microtec, Texas Instruments, Unaxis, VLSI Research, Wacker Siltronic, Wolfson Microelectronics

Global semiconductor sales rise record 6.8% in October

According to the Semiconductor Industry Association (SIA), the worldwide sales of semiconductors rose to \$15.4 billion in October 2003, a 6.8 percent increase from the \$14.4 billion recorded in September, and a 23.3 percent rise from October of 2002. With the October 2003 gain, the strongest since 1990, industry revenue has grown 16.4% in the year to date,).

October 2003 (Billions)			
Month-to-Month Sales	Last Month	Current Month	% Change
Market			
Americas	2,75	2,94	6,7%
Europe	2,72	2,97	9,3%
Japan	3,36	3,56	5,9%
Asia Pacific	5,62	5,97	6,2%
TOTAL	14,45	15,43	6,8%
Year-to-Year Sales	Market Last Year	Current Month	% Change
Americas	2,65	2,94	10,9%
Europe	2,46	2,97	20,8%
Japan	2,85	3,56	24,8%
Asia Pacific	4,56	5,97	31,0%
TOTAL	12,51	15,43	23,3%

"October is always a strong month for our industry, but this exceeds historical norms," stated SIA President George Scalise. "This growth cycle is dynamic and broadly-based, drawing strength from all geographic markets, all product sectors and all end markets, especially computation, communications and global consumer". "Revised Q3 U.S. GDP growth of 8.2% was driven by strong consumer spending of 6.4% and an upwardly revised increase of 18.4% in business spending on computers and software, providing additional evidence that business investment is now recovering," Scalise added. PC's drove semiconductor growth in October, with DRAMS up 8.0 percent in the month and Microprocessors up 6.6 percent.

November's Book to Bill ratio hit 1.11

The Worldwide Semiconductor Equipment Book-to-Bill ratio reached 1.11 in November 2003 according to the market research company VLSI Research Inc. Worldwide Bookings amounted to \$3009M, while Billings were at \$2712M. Of the Billings, \$1405M were for Wafer Processing equipment, \$752M for Test and Related Equipment, \$206M for Assembly, and \$348M for Service and Spares. The front-end capacity utilization rate reached 98.8% in November, according to the market research company, and is expected to decrease to the level of 97.1%.

Million USD

	Billings (3 month avg.)	Bookings (3 month avg.)	Book-to-Bill
October 2003 (final)	2634,0	2718,5	1,03
November 2003 (prelim.)	2712,0	3009,3	1,11
December 2003 (Forecast)	2754,3	3184,1	1,16

Billion USD

Source: VLSI Research, December 2003

	Billings (3 month avg.)	Bookings (3 month avg.)	Book-to-Bill
November 2003 (prelim.)	13,91	16,47	1,18

<http://www.vlsiresearch.com>

Carrier Capex Set for 2004 Rebound

Analysts at Lehman Brothers are forecasting a "sharp rebound" in European capex "that paints an upbeat outlook for equipment vendors." The Lehman telecom team believes total operator capital expenditure will rise by 9.9 percent in 2004 compared with 2003, to total 23.08 billion (US\$28.66 billion) compared with 20.99 billion (\$26.06 billion) this year, following two years of capex cuts. The analysts expect that the upturn will continue in 2005 and 2006, though the increases in those years will not be as dramatic as the leap in 2004; they're forecasting barely better than flat revenue growth for fixed-line carriers.

<http://www.lehman.com/>

	2002	2003	2004	2005	2006
Total Capex (Millions Euros)	23,102	20,994	23,080	23,872	25,035
Change in Total Capex	-17,2%	-9,1%	9,9%	3,4%	4,9%
Total Capex (as a % of sales)	12,3%	11,0%	11,8%	12,0%	12,4%

European Total Capex Source: Lehman Brothers

Micromachined accelerometers: market and players

Today, the accelerometers market is one of the largest MEMS market. This is due to the maturity of the technology and the large volume applications targeted. Accelerometers are used in automotive, defense, medical, consumer and seismic applications. The automotive market segment including applications for airbag and suspension, is the largest market. This report reviews the accelerometers market, the main players and manufacturing technologies.

A market of \$559 millions in 2005 !

The following table and graph (Figure 1 and Figure 2) show the accelerometers market forecast for the 2002 – 2005 time period. The total market has been estimated to be \$420 million in 2002 and \$559 million in 2005. This is a 13% CAGR. Today, the automotive application is 90% of the overall market for airbag deployment sensing and active suspension. The main characteristics of the automotive field is that it requires low cost chips in the range \$3 to \$5 per component. In the accelerometers field, main manufacturers are Bosch, Analog Devices and Motorola.

With a yearly production of cars of 40 millions units (CAGR of 0.36 %), we estimate that 180 million of accelerometers will be necessary in 2005 for the automotive field only.

	Units	2002 ASP(\$)	Market	Units	2005 ASP(\$)	Market
Airbag	90	3	270	120	2,5	300
Suspension	23	5	115	60	3	180
Defense	0,02	800	16	0,1	500	50
Medical	0,16	70	11	0,3	50	15
Pacemaker						
Consumer	0,02	3	0,06	2	1,5	3
Seismic	0,01	800	8	0,015	700	11
TOTAL			420			559

Figure 1: Accelerometers market forecasts in million units and \$ million market (Yole source)

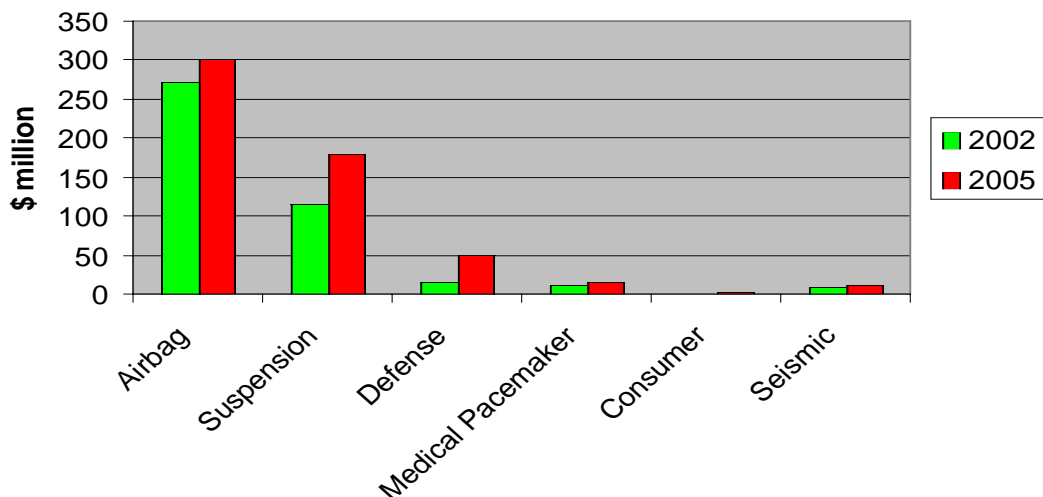


Figure 2: Market volume in \$ million for the different applications over 2002-2005

New offer from Yole Développement:
the World MEMS Inertial Sensor Markets report.

The MEMS gyroscopes markets will exceed the MEMS acceleration sensors markets in 2005.

The inertial sensor applications are the most buoyant of the MEMS markets. Yole Développement evaluated that, between 2002 and 2005, the compound annual growth rate (CAGR) of gyroscopes will exceed 25%, growing from 314 M\$ in 2002 to 649 M\$ in 2005. As a comparison, the CAGR of acceleration sensors will be 15%, growing from 420 M\$ to 550 M\$ over 2002-2005. **For the first time, the markets for micromachined gyroscope will exceed acceleration sensor markets in 2005.** Both markets are dominated by automotive applications

This new report provides a complete in-depth analysis of the micromachined acceleration sensors and gyroscopes applications and markets. Yole Développement also describes for the first time **the market shares in the automotive fields of the different manufacturers**, a comparison of the different devices available on the market, complete profiles of all the worldwide manufacturers (including manufacturing facilities) and a clear analysis of the technology trends.

Report name	WISM
Publication date	January 2004
Number of pages	80
Price	2.900 Euro/3.800 US\$

Contact for more information or for purchasing the report :
JC ELOY
Tel : +33 472 83 01 82
Email : eloy@yole.fr

CONTENT OF THE REPORT:

- Executive summary
- Methodology
- Overview of MEMS markets and importance of the inertial sensor business
- Presentation of the manufacturing technologies for gyroscopes and acceleration sensors (flowcharts)
- Presentation of the different sensing principle for gyroscopes and acceleration sensors
- Analysis of the applications and linked markets in the automotive, consumer, medical and defence business
- Comparison of the products on the markets for gyroscopes and acceleration sensors (specifications and prices)
- Forecasts of the applications and markets
- Focus on the automotive market: market shares of the devices manufacturers in the automotive fields, both for gyroscopes and acceleration sensors
- Analysis of the strategies of the major players
- Presentation and analysis of the manufacturing facilities of the major 20 major inertial sensor manufacturers and complete profiles
- Synthesis and conclusion

Company profiles included in the report : Analog Devices, Applied MEMS, BAE/SSS, BEI Systron Donner, Bosch, Colibrys, Conti-Temic, Dalsa Semiconductor, Delphi, Denso, Honeywell, IMT, Murata, Matsushita, Samsung, Sensoror/Infineon, STMicroelectronics, Tronic's Microsystems, VTI Technologies, X-Fab

The 8 first manufacturers of accelerometers represents more than 90% of the total market share in number of components. Main manufacturers are Bosch, Analog Devices, Motorola (part of the production is sub-contracted to Dalsa), VTI Hamlin, X Fab, Denso, Delphi-Delco and SensoNor (now Infineon). In 2002, the total volume for automotive was 113 millions of components for a \$338 million market. We should note that Infineon also uses pressure sensors as side airbag sensors placed inside the door structure.

A large part of the production is using DRIE

Regarding the accelerometers micro-structure, 40 % of total production are comb-drive accelerometers (which represents 45 millions units). The companies manufacturing comb-drive accelerometers are Delphi Delco (less than 10 million units per year), Denso (10 million units per year) and Bosch. Matsushita also develops comb-drive accelerometers. Today, these accelerometers are at the feasibility stage.

The production yield is in the range 70% to 80% for accelerometers and about 1800 accelerometers are manufactured on a 6" wafer with an average size of 8 mm². We estimate that 56 % of accelerometers are surface micromachined and 44 % of accelerometers are bulk micromachined. But, some players (such as Bosch, AD...) are using Deep RIE equipments in surface micromachining process in order to benefit from the high etch rate. Figure 6 shows the process characteristics for the main manu-

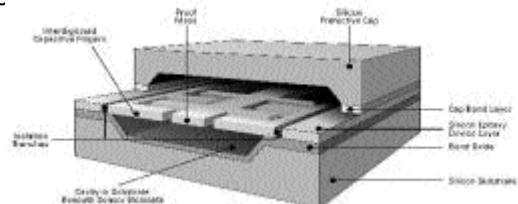


Figure 3: Delphi Delco accelerometer

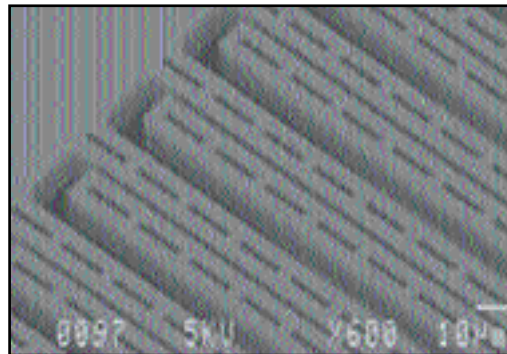


Figure 4: Denso accelerometer

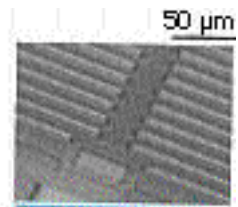


Figure 5: Bosch accelerometer



	Bosch	AD	Motorola	VTI	X Fab	Denso	DelphiDelco
Wafer size (inches)	6	6 and 8	4 and 6	NA	6(mainly for Temic components)	5	5
Estimated 2002 productions in millions	25	20	15	10	10	10	<10
Technology	Surface (using DRIE equipments)	Surface (using DRIE equipments)	Bulk (done by Dalsa)	Bulk (wet)	DRIE	Bulk (DRIE)	Bulk (DRIE)

Figure 6: Accelerometers companies processes

In conclusion, accelerometers is one of the most important volume market for MEMS (\$420 millions out of \$ 3 600 millions), mainly for the automotive field. It is also the MEMS devices which is mainly made by DRIE equipment. In the Special Reports to come in further issue of Micronews, one will especially dedicated to DRIE.

Yole Développement has just released the World Inertial Sensors Market study. If you are interested, please contact Jean-Christophe Eloy at eloy@yole.fr

One application: MEMS accelerometers for the geophysical industry

The French company, Tronic's Microsystems announced at the end of 2003 a collaboration with Sercel, the world leader in the development and manufacturing of seismic data acquisition. Geophones are ultra-sensitive sensors that detect vibrations of less than a millionth of the earth's gravitational acceleration. During exploration, an array of geophones is deployed over the ground in order to gather measurements from a wide range points. Geophones measure the reflection of the waves sent on the surface by vibrating trucks. This technology allows to draw a subsurface geological map indicating the location and size of oil and gas reserves. The device is the result of co-development between Tronic's, CEA and Sercel. It is based on silicon micromachining and protected by ceramic packaging.

<http://www.tronics-mst.com>

<http://www.sercel.com>



Life & Death

Wispry announced its first production available in second quarter of 2004

Wispry is a spin-out company formed from the RF/Wireless business unit of Coventor. WiSpry was formed in October 2002 and have closed their first outside round of venture funding. Wispry is a fabless product company targeting voice and data acquisition and communications applications with a focus on the wireless, broadband, and test and instrumentation markets. WiSpry will be ramping their first products into production in 2Q04 and then plan additional production releases on a quarterly basis. Early products include a SPDT relay pair, a family of 3V RF switches in configurations up to 6T and beyond, and a family of switchplexers and tunable filters. WiSpry have also built baluns, phase shifters, and crossbar switches.

<http://www.wispry.com>

ComLab, facilities for Micro and Nanotechnology

ComLab, created in 1998, is an initiative for coordinating complementary forces in production, development, research and education present at CSEM, at the University of Neuchâtel and at the EPFL in Lausanne. ComLab facilities are fully equipped to provide R&D activities in micro and nanotechnology such as mechanical components, and systems, electrochemical microsystems, biomicrosystems, micrototal analysis systems (μ TAS), tools for nanoscience and applied nanosystems, with complete technological support.

<http://www.csem.ch>

Techno News

EV Group has been selected to install equipment at Beijing's Tsinghua-Foxconn Nanotechnology Center

EV Group (EVG), manufacturer of MEMS and semiconductor wafer processing equipment announces the successful installation of several advanced wafer processing tools at Tsinghua-Foxconn Nanotechnology Center at National Tsinghua University (NTHU), located in Beijing - China. NTHU is well known for leading-edge education and serves as a knowledge site in the MEMS and Nanotechnology area throughout Asia. EVG has installed an EVG101 resist coating system, an EVG101 develop system, an EVG301 cleaner, an EVG620 precision alignment system for double-side lithography and an EVG520HE hot embossing and nanoimprinting system. Special tooling inside the embossing chamber performs the de-embossing process in a fully-automated manner. With the EVG520HE it is also possible to carry out a wide spectrum of bonding methods, which are necessary for MEMS fabrication, said the company.

Business News

TRACIT Technologies secures first round funding of 2.5 M to speed up marketing of new products obtained by its layer transfer technology

Tracit Technologies, a spin-off from the CEA-LETI, specialized in thin film transfer by molecular adhesion and mechanical and/or chemical thinning, has finalized a first round of financing of Eur. 2.5 million. This operation was led by ACE Management in partnership with Emertec Gestion. CEA Valorisation who has backed the company since its creation is also participating in this financing. Financial investors provide the company with the means to develop technology quickly to bring new products out on Tracit's markets, i.e. power electronics and micro-systems (MEMS), according to Bernard Aspar, founder, member and chairman of Tracit Technologies. This financing will also enable the company to build up its international sales network and to recruit key people, with acknowledged skills in the microelectronics world, to achieve its objectives

<http://www.tracit-tech.com>



Business News

Memscap confirms announcement

MEMSCAP, provider of innovative solutions based on micro-electro-mechanical technology (MEMS), confirms, as previously announced in a press release, that the Company Shareholder's meeting (convened by official publication on December 12, 2003) will deliberate on December 29, 2003, on two main topics that are: a new capital increase in cash of an amount in euros equivalent to 1.5 million US dollars and an issuance of free warrants ("BSA") for its shareholders.

<http://www.memscap.com>

Alliance & Mergers

Micralyne and LioniX into manufacturing relationship

Micralyne and LioniX announced that they have established a collaboration to better serve their customers worldwide with MEMS development and manufacturing services. Micralyne, a developer and OEM manufacturer of MEMS components, will offer volume-manufacturing capacity to LioniX customers that move beyond development quantities. In return, LioniX, a provider of solutions based on microsystem technology and MEMS, provides Micralyne with an additional gateway into Europe.

<http://www.micralyne.com>

<http://www.lionixbv.nl>

members of the IntelliSense Software team. IntelliSense Software Corporation is continuing the development of the leading CAD tool for MEMS. IntelliSense Software will provide all of the existing software customers continued support to the software products. In September, 2003 it was announced that Corning Intellisense would discontinue its business operations and seek a buyer for certain assets, including its software business. Corning Intellisense will close early this year.

<http://www.micralyne.com>

<http://www.lionixbv.nl>

LioniX starts Beta testing of Phoenix products

LioniX a successful spin off of MESA+ and the strategic partner of Phoenix, has started the Beta testing of Phoenix database products CoreDB, OperatorDB and ProcessFlowDB. These products serve LioniX to extensively secure their knowledge of microsystems in building new products. "This software enables us to implement integral quality control. We can now put more resources on the real design issues" said Albert Prak, COO of LioniX. According to CTO René Heideman of LioniX: "This software is truly unique in the Microsystems Field. This software will help us in further implementation of our 'first time right' design strategy".

<http://www.lionixbv.com>

Intellisense Software announced acquisition of Software assets of Corning Intellisense

IntelliSense Software Corporation announces that it has acquired the software business unit assets of Corning IntelliSense, a subsidiary of Corning Incorporated. The newly formed IntelliSense Software Corporation (ISC) is headed by the original

Events

MICRONORA

28 th September to 1 st October 2004, Besançon -France

Today microtechnology unmistakably forms part of worldwide industry. Every day, miniaturisation and high precision increasingly takes the lead in all sectors of cutting-edge industry. Micronora occupies this privileged niche and as the international microtechnology trade fair, it is a "lateral" trade fair covering all sectors of activity and all professions .

It will be held in Besançon - France from 28 th September to 1 st October 2004.

The concept and essence of Micronora is one of a kind and it will be the ideal opportunity for all those involved in the microtechnology sector, including electronics and microelectronics, to put to advantage their expertise and innovations. (Previous edition: 855 exhibitors of which 28% foreigners - 15,000 professional visitors.)

Over the past thirty years Micronora has become the largest European microtechnology trade fair and is recognised as one of the best developed professional trade fairs. It is a place where manufacturers can meet and interact and where prime manufacturers can spot various opportunities for new markets.

For further information : www.micronora.com/ contact@micronora.com Tel. + 33 (0) 3 81 52 17 35 Fax + 33 (0) 3 81 41 30 89



Events

The Micro & Nanotechnologies 2003 Synthesis Seminar: major achievements and future trends highlighted by 150 experts

The 2nd OMNT Synthesis Seminar on Micro and Nanotechnologies will be held the 29th of January 2004 at "Maison de la RATP", Paris. During this day, experts will address the latest intellectual achievements and valuable discoveries in the fields of nanotechnologies, molecular electronics, optical materials and components, instrumentation for biological applications and micro-sources of energy. The commercialization issues unique to these emerging and disruptive technologies will also be discussed. A Round Table on industrial applications on nanotechnologies will conclude the day. This synthesis seminar is open to everyone (but all oral presentations will be in French). Last year, the first OMNT Synthesis Seminar gathered 250 people. Do not hesitate to register now (at the web link below) as the number of available place is limited. The OMNT ("Observatoire des Micro & Nanotechnologies") is a French initiative gathering 150 experts analysing the latest achievements in micro and nanotechnologies.

<http://www.minatec.com/actualite/omnt2003.htm>

Venture Capitalist forum for the European MEMS projects

Europractice is a European Commission initiative, launched in 1995, aimed at stimulating a wider exploitation of state-of-the-art microtechnologies by the European industry.

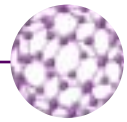
On December 16th, Europractice organized a forum in order to promote seven European selected MEMS projects to Venture Capitalist companies. Under this mission, Europractice also granted a business support to each MEMS projects : definition of the project, realization of a business plan ... The VC Forum took place in Frankfurt and invited 21 European investors. During the meeting, project leaders presented their project and their objectives of development.

For further information regarding this Europractice initiative on the MEMS projects:

Yole Développement, +33 472 83 01 89 / 41 15



Start-up	Project's Description	Company / contact
MCB (It)	Miniaturized bioreactors for the study of living cells under various chemical and physical conditions.	Arti Ahluwalia arti.ahluwalia@ing.unipi.it
Nanomi (NL)	Microstructured polymer membrane providing an improved filtration performance www.nanomi.com	Hans Vuik, CEO hansvuik@nanomi.com
dsTEC Ltd (UK)	An ultrasonic gas flow sensor for the accurate diagnosis of asthma and the management of its medication	David Hitchings daih@dstec.co.uk
Lein Applied Diagnostics (UK)	A low cost, non-invasive optical sensor for pain free blood glucose measurement for diabetics	Graeme Clark graeme.clark@lein-ad.com
Aisthis (G)	Miniature capacitive type SOI pressure sensors	Stravos Chatzandroulis, stravos@imel.demokritos.g
Longevyty (NO)	The Light Modulator "Relief" of third generation: a cost and performance effective core technology for photo finishing, display, mobile phone panel and telecom technologies.	r Yuri Guscho, yury@frisurf.no
West Micro Technologies (UK)	Ultrathick Su-8 Process (UTSP) technology for the production of high precision and thick microstructures www.wmtl.co.uk	Kyle Jiang kyle@wmtl.co.uk



SARS Viruses Deactivated by Silver-Coated Nanoparticles

Scientists in Marburg, Germany, have found that the viruses responsible for the severe acute respiratory syndrome (SARS) - as well as other pathogenic bacteria and fungi - are deactivated by silver-coated titanium dioxide nanoparticles. The nano-powder (brand name Nanozid), which is harmless to humans, can be used in coatings for applications in hospitals, in the food and beverage industries and in HVAC systems, often implicated in the spread of infectious diseases.

<http://www.itn-nanovation.com>

IBM Uses Nanotechnology to Build Chip Components

IBM announced it is the first to successfully create nanocrystal memory devices using molecular self assembly techniques, leading to critical device features that are smaller, denser, more precise and more uniform than those achieved using conventional methods. This will potentially enable continued device miniaturization and chip performance improvements. The technique is compatible with existing chip-making tools, so will avoid both the high cost of tooling changes and the risks associated with major process changes.

<http://www.ibm.com>

Infineon and the Use of Organic Materials for Next Generation Electronic Devices

Researchers at Infineon Technologies have announced that encouraging results have been demonstrated in the performance, reliability, and temperature behavior of transistors, circuits, and memories based on organic materials. Conventional depo-

sition processes and photolithographic patterning techniques will allow manufacturing of these devices in a cost effective manner.

<http://www.infineon.com/>

Chemical Industry Releases Roadmap for Nanomaterials

On 12 December 2003 the Chemical Industry R&D Roadmap for Nanomaterials By Design was released. It is designed to stimulate public and private investment, guide chemical industry R&D, and inform policy development, and help "accelerate delivery of enormous nanomaterial benefits to the U.S. economy and all of society".

The long-term goal is to develop the capability in designing nanomaterials tailored to specific end-use functions, and promises revolutionary advances in energy, computing, medicine, and other fields.

<http://www.chemi>

calvision2020.org/pdfs/nano_roadmap.pdf

Nanogen develops nanofabrication technologies

The US company has been issued a US patent No. 6,652,808, "Methods for the

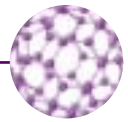
Electronic Assembly and Fabrication of Devices » for producing electronic and photonic devices using nanoscale components.

The new Nanogen patent describes a unique electric field 'pick and place' process that facilitates the bringing together or integration of diverse DNA nanocomponents, thereby helping solve difficult scaling issues. Combining the top-down electric field process with the bottom-up DNA self-assembly process enables more selective and higher precision incorporation of nanoscale components into higher order devices and structures," said Dr. Michael J. Heller, co-founder of Nanogen.

The new nanotechnology patent relates to a nanofabrication technology that combines an electric field assisted manufacturing platform and programmable self-assembling nanostructures (for example, DNA building blocks) for the fabrication of a wide range of unique higher-order nano and microscale devices, structures, and materials.

The company has now been issued nine patents during 2003, bringing the total number of patents issued in the U.S. to 56. <http://www.nanogen.com>





Business News

Nano tools – the next big market?

If the picks and shovels manufacturers made the real money in the Gold Rush; today's industrial equivalent are the 'tool' manufacturers that are enabling the nano revolution. Instrumentation and equipment manufacturers are already making money, fuelled by the billions of dollars available globally from government funding for R&D. Who will be the winners? IBM is still cashing in on their early work in microscope technology. Recently, Pacific Nanotechnology Inc. (PNI) announced it had licensed IBM's patent for the fundamental technology for the atomic force microscope. PNI has also embarked on an alliance with NanoFeel, a Swiss company which produces force feedback manipulators for AFM's

<http://www.pacificnanotech.com>

<http://www.nanofeel.com>

'Nanotechnology Tools Companies 2004', a new report from the Institute of Nanotechnology, <http://www.nano.org.uk> or contact andy@nano.org.uk

U.S. Government Confirms Nanotechnology Vital to U.S. Competitiveness

The United States Government passed the 21st Century Nanotechnology Research and Development Act (The Nanotechnology Act), which allocates \$3.7 billion for R&D over the next four years. The legislation is viewed by many as an important step in securing the U.S.'s position as the leader in what experts predict will be a trillion dollar industry within a decade, assuring U.S. economic growth and jobs across a wide spectrum of business and science sectors.

<http://www.nano.gov>

New strategy for BASF

The world's leading chemical company, BASF, announced it will focus more closely on its business areas that show the most promise in terms of market attractiveness and profitability when deciding on new investments. New areas of knowledge such as nanotechnology, materials science, energy management technologies and biotechnology play a particularly important role in BASF's strategy. These are the areas from which the company expects the most important impulses for the chemistry of the future.

<http://www.basf.de>

Degussa Advanced Nanomaterials inaugurates Pilot Reactor for Zinc Oxide

Degussa Advanced Nanomaterials has reached a milestone on its way to a profitable business with new nano-scaled products. The internal start-up, founded in January 2003, of Degussa AG, Düsseldorf, officially started its new pilot reactor for the production of nano-scaled zinc oxide in the industry park of Hanau-Wolfgang. The new reactor will provide yearly production capacity of pyrogenic zinc oxide in ton quantities.

<http://www.advanced-nano.com>

Alliances & Mergers

Volkswagen in trial cooperation with Israeli nano start-up

German automobile manufacturer Volkswagen has begun a trial cooperation with Israeli start-up Nano Materials. Nano Materials was set up just over 18 months ago to commercialise a dry lubrication material based on nanostructures developed by Prof. Reshef Tenne of the Weizmann Institute. This material clings to the mechanical parts of an automobile, reducing friction to a minimum. Consequently, the oil will not need changing, and other parts will not need replacing so frequently, making the vehicles of the future longer-lasting. It also offers exciting possibilities in the fields of space and avionics.

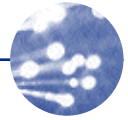
<http://www.apnano.com>

New fuel consumption-cutting product to be trialled by UK bus operator Stagecoach

Cerulean International Limited, the UK-based subsidiary of the British nanomaterials company Oxonica Limited, has announced that its new product Envirox is to be commercially evaluated by Stagecoach UK, with a view to adopting the product over Stagecoach's 7000 strong UK bus fleet. Envirox delivers 10% fuel economy benefits, as well as reducing carbon deposits in the engine and lowering emissions.

<http://www.oxonica.com/content/OX307010-Envirox.pdf>





Alliances & Mergers

Con Edison taps ADVA for wavelength service offering in metro NY

ADVA Optical Networking today announced Con Edison Communications (CEC) as a new carrier customer for its Fiber Service Platform (FSP) 3000. One of CEC's offerings is a managed wavelength service, the PowerWave Wavelength Service, which addresses the access and capacity constraints within the New York metro area. ADVA's FSP 3000 not only enables CEC to relieve capacity constraints, say ADVA representatives, but also offers premium storage transport capabilities. A subsidiary of Consolidated Edison Inc. (CEI), which is also the parent company of the large electric and gas utility Consolidated Edison Company of New York Inc., CEC, has built an extensive fiber network of more than 380-route miles utilizing primarily Con Edison of NY's conduits. The network interconnects over 100 commercial buildings and numerous major carrier points-of-presence (POPs) and central offices (COs) in New York City. The network design enables CEC to eliminate single points of failure and offer a competitive service to its customers in the financial services, healthcare, media and entertainment, and telecommunications sectors. CEC extensively tested ADVA's FSP 3000 product for network interoperability up to speeds of 10 Gbits/sec and has certified it now to support the PowerWave Wavelength Service. The FSP 3000 employs parallel use of DWDM and TDM technology to enable all protocols between 8 Mbits/sec and 10 Gbits/sec and up to 256 applications to be transported over one single fiber pair. The system's design supports point-to-point, linear add/drop, ring, and meshed network topologies of up to 10 nodes across distances up to 500 km without regeneration.

<http://www.advaoptical.com/>
<http://www.electricfiber.com/>

Alcatel and Pirelli develop "Radio over Fiber" module for 3G mobile networks

Alcatel has signed an agreement with Pirelli to integrate an optoelectronic module developed by Pirelli Labs and Telecom Italia Lab in its Evolium multi-standard Remote Radio Units solution, designed to reduce costs and electromagnetic emissions of 3G networks. Evolving from a centralized Base Station platform architecture to the concept of multiple distributed radio access points all connected to one common central unit, the Alcatel Evolium multi-standard radio solution will integrate Pirelli's "Radio over Fiber" module. It will allow a smooth physical split between the central unit and multiple remote radio access heads by using direct optical fiber transmission. Integrating the "Radio over Fiber" solution of Pirelli will provide Alcatel with a significant competi-

tive advantage when compared with other available solutions in the marketplace, allowing increased cost efficiency and easier combination of multiple access technologies in mobile networks, say Pirelli representatives. In addition, the Alcatel Evolium solution will make site acquisition much easier, allowing the re-use of existing 2G sites for 3G while simplifying the operation and maintenance of hybrid networks.

<http://www.alcatel.com>
<http://www.pirelli.com>

WSI orders Aixtron MOCVD system for VCSELs

The Walter Schottky Institute (WSI), a central institute of the Technische Universität München, has placed an order with Aixtron for an AIX 200/4 MOCVD system. The Semiconductor Technology group at WSI concentrates on VCSELs and edge-emitting lasers in the wavelength region up to 10µm as well as millimeter wave devices. The group will utilize the new system for studies on long wavelength VCSEL layer structures with its unique buried tunnel junction (BTJ) technology. Based on the (InGa-Al) (As-P-Sb) material system, lasers with a wavelength of 1.55 µm to 2.0 µm will be manufactured. These devices are regarded as key components of future fiber optic communication systems.

<http://www.aixtron.com>

Chinese component group is thinking global

Four Chinese optical component vendors have merged to create a diversified optics and photonics manufacturing company called Photop Technologies. Four Chinese optical component vendors have merged to create Photop Technologies. With headquarters in Fuzhou, Fujian, China, and Milpitas, California, the new operation employs more than 1000 staff and has access to 40 000 sq. m of facilities. The consolidated company - which comprises Koncent Communication (Koncent), Shanghai Uniwave Technologies (Suwtech), Fujian Sandgy Optronics (Sandgy) and Fuzhou Microlattice Semiconductor (Microlattice) - will offer products and related services in the following core areas:

- passive and active components and modules for optical communications
- diode-pumped solid-state green/infrared lasers for display, entertainment, pointing and laboratory applications
- high-precision optical components and crystals for instrumentation, fiber-optic and communication lasers
- compound semiconductor crystals (GaAs and InP) as substrates for LED, laser-diode and wireless communication components.

<http://www.photoptech.com>



Alliances & Mergers

DuPont Photonics selects optical alignment system from Palomar Technologies

DuPont Photonics Technologies LLC has selected Palomar Technologies' FAST 60 Optical Alignment System to automate the testing of manufactured planar integrated photonic devices for use in optical networks for the telecommunications industry. DuPont Photonics Technologies is a wholly owned subsidiary of DuPont located in the Boston suburb of Wilmington, MA. DuPont Photonics combines advanced materials and design expertise using a library of proven optical building blocks with fabrication know-how to create integrated photonic devices based on planar lightwave circuitry. Bookham Technologies as well, has selected Palomar Technologies for a system for optical components.

<http://www.palomartechnologies.com/>

Alcatel 's Indium Phosphide technology goes to OMMIC

Alcatel and OMMIC are collaborating on the transfer of Alcatel's advanced InP Heterojunction Bipolar Transistor (HBT) technology to OMMIC's Industrial Clean Rooms at its centre in Limeil-Brévannes, France. The transfer will complete OMMIC's commercial portfolio of III-V technologies and will provide Alcatel's system designers with a qualified source to develop 40 Gbit/s transmission systems for core networks. InP, now well established as the choice material for long wavelength (1.3 –1.6 μ m) optoelectronic devices, is receiving an increasing interest for its potential in microelectronic applications, ranging from millimetre-wave space and terrestrial communication systems, to very high bit rate fiber transmission systems (e.g. 10 and 40Gbit/s). The InP HBT technology was developed by the Alcatel Research & Innovation Department in the framework of its studies into 40 Gb/s transmission.

<http://www.ommic.com/>

Life and Death

Corning Closes Two Plants

Corning Incorporated announced that it will consolidate the manufacturing operations of its high purity fused silica (HPFS®) and fluoride crystal materials production into its Canton, N.Y., facility, and its fluoride crystals components finishing production into Corning Tropel's operation in Fairport, N.Y. These actions will result in the closure of Corning facilities in Charleston, S.C., and North Brookfield, Mass.

<http://www.corning.com/>

Business News

Optical spending is stabilizing, according to Infonetics Research

Worldwide optical network hardware revenue hit \$2 billion in 3Q03, a 3% decrease from 2Q03, according to Infonetics Research's quarterly worldwide market share and forecast service, Optical Network Hardware. After a decline in 2003, modest growth is projected through 2006, when the market will top \$10 billion. "The optical hardware market is stabilizing," said Michael Howard, principal analyst and co-founder of Infonetics Research. "The telecom service provider capex [capital expenditure] declines are finished or nearly finished, and they will maintain a flat-to-slow-growth in the future. We expect optical equipment spending worldwide to be relatively stable from 2003 through 2006, and in North America to level out during 2003 and then start slow growth."

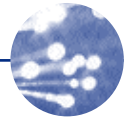
CIENA Posts Revenue of \$70.6 million, up 3% Sequentially

CIENA reported quarterly revenue of \$70.6 million, a 3% sequential increase and an increase of 14% from the same period a year ago. CIENA's reported net loss for the quarter was \$115.0 million, or a net loss of \$0.24 per share. For the full fiscal year ending 31-October-2003, revenue totaled \$283.1 million, a 22% decrease from fiscal 2002. On a GAAP basis, CIENA's net loss for the fiscal year was \$386.5 million, or a net loss of \$0.87 per share, compared to the previous year's GAAP net loss of \$1.6 billion, or \$4.37 per share.

Asia-Pacific service provider capex to reach \$30 billion in 2003

Asia-Pacific service provider revenue is increasing 15% from 2002 to 2003 to \$139 billion, and capital expenditures are rising 3% to \$30 billion, representing a capex-to-revenue ratio of 22%. The figures come from the Infonetics Research report Service Provider Roll Call and CapEx Analysis, Asia Pacific 2003.

<http://www.info.infonetics.com/>



Business News

A 16% growth rate forecast for 10-Gbit/sec components from 2004 to 2008, according to CIR report

The market for 10-Gbit/sec electronic and optical components and modules will grow to \$856 million by 2008, according to a new report from CIR, a telecommunications and semiconductor industry analyst firm based here. Average annual growth rate for the 10-Gbit/sec sector will be around 16% for the 2004 to 2008 period. Components and technology innovations are now the primary source of cost, performance and functionality advantage for 10-Gbit/sec equipment vendors. These are most likely to stem from improved packaging, bet-

ter power consumption and thermal control, as well as enhanced manufacturing processes. Components manufacturers that can demonstrate how their products will enable 10-Gbit/sec networks to have clear cost advantages over networks based on multiple lower-rate lines will quickly gain better margins and market share. Integration can be a differentiating feature and help hold down costs, but they must be oriented towards market needs. By 2008, WDM-related optics and electronics will represent almost two-thirds of the 10-Gbit/sec market. This is due to the fact that WDM systems are more likely to operate at 10 Gbit/sec than SONET/SDH or Ethernet systems and that some of the optics for WDM systems remain quite expensive.

<http://www.cir-inc.com/>

Profitability of optoelectronic component manufacturer impacted

According to Frost & Sullivan, new analysis on the world optoelectronics market, reveals that it generated revenues totalling \$4.23bn in 2002. Total market revenues are expected to reach \$7.22bn in 2009.

<http://www.electronics.frost.com>

Techno News

VCSELs fill the 10 to 100 mW power gap

ULM Photonics GmbH, Germany, recently sampled high power VCSELs in the 10..40 mW power range to selected customers. Today, a whole product family of high power VCSELs can be released, based on ULM Photonics' outstanding technology and matched to qualified response from the marketplace. These devices are built to fill the power gap between standard multimode VCSELs emitting below 5 mW and conventional edge emitting lasers emitting several 100 mW.

<http://www.ulm-photonics.de>

Honeywell introduces 4-Gig VCSEL

The VCSEL Optical Products Division of Honeywell announces availability of their new family of VCSELs (Vertical Cavity Surface Emitting Laser) and detectors targeted at 850nm fiber optic communication systems operating at speeds from 100Mbps to 4.25 Gbps over multimode fiber. The HFE4192-581 VCSEL and HFD3180-20x Detector are available in fiber sleeved components for small form factor LC interfaces. The HFD3180-20x detectors provide RSSI functionality in either 4 or 5 pin configurations.

<http://www.honeywell.com/>

Mitsubishi develops 10 Gbit/s uncooled DFB

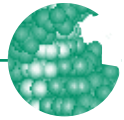
Mitsubishi Electric has successfully developed a directly-modulated 10 Gbit/s DFB laser diode that will be used for 10 Gbit/s optical telecommunications. The Japanese company reports that the laser operates at 10 Gbit/s at temperatures of up to and including 120 degrees C without the need for a cooling element. The new devices are expected to lower the cost of high-capacity 10 Gbit/s networks, while their low power consumption should make them ideal for metro networks that combine high-speed FTTH (Fiber To The Home) and intranet LAN (Local Area Networks) with backbone lines.

<http://global.mitsubishielectric.com/>

Biscom's FastWeb to build fiber network in Venice

FastWeb, e.Biscom's telecom company, has begun installing a fiberoptic network in northeastern Italy that will cover the cities of Venice and Mestre and the lagoon islands. The three-year project, which is part of e.Biscom's recently announced strategic plan, will cost 60 million euros and use a 150-km duct system in Venice that e.Biscom received from Telecom Italia when it bought Telecom Italia's Socrate's cable television assets. In addition to fiber-based access services, FastWeb will offer ADSL service including television over ADSL. FastWeb expects to connect 40% of its customers using FTTx technology and 60% using ADSL. During the initial rollout in 2004, FastWeb will pass 80,000 potential customers. Both access technologies allow FastWeb to offer bundled voice, high-speed Internet access and television services.

<http://www.ebiscom.it>



Alliances & Mergers

Hitachi and DNA Chip Research Inc have jointly developed a DNA chip

Hitachi Software Engineering Co. Ltd, and DNA Chip Research Inc. co-develop a DNA chip embedded with oligonucleotides corresponding to 30,000 genes, which cover almost all human genes. This product will be marketed in early September. The two partners have attempted to cut costs by using "Oligos" instead of the conventional cDNA as gene fragments to be embedded in the DNA chip.

<http://www.hitachi-soft.com>

<http://www.dna-chip.co.jp>

Ciphergen announced services alliance

Ciphergen signed contract of collaboration with GE Medical Systems Trade and Development Co. Ltd. This agreement is an exclusive post-sale service partnership for ProteinChip™ systems to hospitals in China, Hong Kong and Taiwan. The two companies have already worked together last year. Financial and others terms were not disclosed.

<http://www.ciphergen.com>

<http://www.gemedicalsystem.com>

License agreement between Exiqon and Integrated DNA Technologies

The collaboration regards Exiqon's Locked Nucleic Acid (LNAT) technology. Integrated DNA Technologies HAS acquired non-exclusive rights to manufacture and sell LNAT oligonucleotides for the genomics research market and will receive from Exiqon know-how regarding LNA. Financial terms of the agreement were not disclosed.

<http://www.exiqon.com>

<http://www.idtdna.com>

Partnership between MWG Biotech and University College Cork

The German company, MWB Biotech AG based in Ebersberg, announced a long-term agreement with the Alimentary Pharmabiotic Centre (APC) at University College Cork (UCC) and Teagasc, Ireland, a new Science Foundation Ireland research centre. With this collaboration, MWB Biotech will supply the full range of its products and services to support APC in the creation of a new state-of-the-art microarray facility. The partners expect series of orders in substantial volume in the forthcoming months.

<http://www.mwg-biotech.com>

<http://apc.ucc.ie>

A multimillion dollar service contract for Advion BioSciences

The company signed a three-year contract to provide bioanalytical services for an unnamed, top-ten pharmaceutical company. Under the terms of the agreement, Advion will provide scientists and instrumentation to support the pharmaceutical client's bioanalytical method development, method validation, and sample analysis programs.

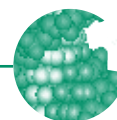
Business News

Gyros closes third funding round

The company, based in Sweden, announced mid-December the success of their third round funding. The total amount reaches approximately 20 Million, coming from the largest private venture capital biotech investment in Scandinavian this year: Scandinavian Life Science Venture (SLSV), Investor Growth Capital, Schroder Ventures Life Sciences, 3i, Etna Forvaltning AB, Swedish Industrial Development Fund, InnovationsKapital, Health & Brand Capital and Life Equity Sweden. At the same time, the company announced the collaboration with George Washington University to evaluate and develop the recently launched Gyrolab Bioaffy™.

Cantion will continue its development work

In July 2003, NKT Holdings decided to stop involvements in its life science subsidiary Cantion in a sole ownership capacity. Today a new ownership structure for Cantion has been created. New investors include Incuba Ventures, InnFond, Vaekstfonden, CAT-Seed and NKT. By return of its new investments, NKT will receive 20% ownership share in the new Cantion. Cantion develops a chip-based measuring system for molecule detection.



Business News

Sophion Bioscience closes investment round

The company has completed its third financing round of 3.4 Million to secure the required capital for the commercialization of QPatch 16, the company's first ion-channel screening system. Main investors are: NeuroSearch, SLS Venture, Dansk Kapitalanlaeg, Dansk Erhvervsinvestering and Vaekstfonden. Sophion has been created in 2000 and it is a spin-off of NeuroSearch. The technology of high throughput screening of ion-channel modulators has been transferred to the company. This technology, "Patch clamping", is well known in drug discovery applications. The commercialization is expected to start in second quarter 2004. <http://www.sophion.dk>

Allegro Technologies supply spot-on™ nanolitre dispensing technology to Beckman Coulter Inc.

In early 2003, Allegro Technologies, based in Dublin, Ireland, announced an agreement with Beckman Coulter to supply its innovative spot-on™ technology for dispensing nano- and micro-volumes of liquids. This technology forms the basis of simple and controllable systems capable of delivering accurate and precise volumes from as low as 50nL to 20 mL. It enables the development of liquid handling tools that will dramatically impact on drug discovery, high throughput analytical techniques and diagnostics.

A spin-off from Debiotech

As announced at the end of 2003, the Swiss company Debiotech presents its spin-off, SMC, Swiss Medical Care SA. This creation follows 13 years of numerous developments of medical devices and successful license agreements with major companies. With this step, Debiotech is entering for the first time into direct marketing and sales for one of its developments, CT Express™.

<http://www.debiotech.com>

<http://www.swissmedicalcare.com>

Techno News

Cepheid announced MEMS patent

The US company presented U.S. patent No. 6,664,104 "Device Incorporating a Microfluidic Chip for Separating Analyte from a Sample". Cepheid develops the design of a sample preparation cartridge containing a microfluidic chip for extraction and purification of multiple DNA targets simultaneously. The innovation of this technology is that it may enable the integration of Cepheid's automated cartridge sample preparation capability with a high number of genetic targets using solid-state components. "The microfluidic technology is one of the first to enable sample preparation, particularly the capture and concentration of nucleic acids from row biological samples on silicon chips" said Mr Kurt Petersen, Cepheid's President and Chief Technical Officer. This technology presented high cost of development. However because of the use of MEMS technology, Cepheid proposes today a reliable, efficient and low cost product.

<http://www.cepheid.com>

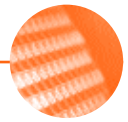
Protiveris acquires sensor's technologies

Protiveris commercializes bioMEMS technologies to develop protein research and discovery of new pharmaceuticals. The US company announced the finalization of an agreement with UT-Battelle to acquire the worldwide commercial rights to proprietary sensor technologies. The sensor's technologies have been developed by scientists of Oak Ridge National Laboratory (ORNL). Protiveris expects to apply the technologies to microcantilever measurements of biomolecular interactions.

<http://www.protiveris.com>

New MEMS developments for the North Carolina State University

NCSU scientists propose using electric fields rather than channels to manipulate liquids and develops microfluidic structures. The NCSU lab-on-chip devices are able to manipulate water of dodecane microdroplets floating freely on a surface of fluorinated oil. Identified applications are material synthesis and biological assays.



Life & Death

Wacker Siltronic processed the first 300mm wafers in Freiberg facility

Wacker Siltronic, a supplier of hyperpure silicon wafers for the semiconductor industry, has successfully started the first processing step at its new 300 mm wafer fab in Freiberg (Saxony/Germany). The first 300 mm monocrystalline ingot was sliced into thin wafers on December 3rd 2003, as scheduled said the company. Bringing the state-of-the-art wiresaw equipment into operation was the first step in a complex series of dozens of more processes to follow. Gerhard Brehm, Project Manager for Wacker Siltronic's new high-volume 300 mm line in Freiberg said that the facility will ship first products to customers in June 2004. Final capacity in Freiberg is scheduled to be approximately 150.000 wafers a month in full built-out. With an investment of more than 400 million euros, WACKER expects to create approximately 600 new jobs in Freiberg. <http://www.wacker.com>

Wolfson receives outstanding financial performance award from the FSA

Wolfson Microelectronics plc announced it has received an award from the Fabless Semiconductor Association (FSA) at its annual awards dinner held in Santa Clara, Calif. on Thursday, 4th December. The award for outstanding financial performance by a private company is given to companies that demonstrated a doubling in either revenue or net-income over eight consecutive quarters ending September 2003. Winning two consecutive awards means achieving very high growth over three successive years. This is outstanding in any circumstance, and truly exceptional considering the economic climate over the last few years," said Jodi Shelton, co-founder and executive director of the FSA.

<http://www.wacker.com>

Sources said Infineon may equip Richmond fab in 2006

Infineon Technologies may begin to install equipment in its empty fab shell in Richmond, Virginia in 2006 at the earliest if supply from its own fabs and its Chinese and Taiwanese DRAM partners is insufficient, according to sources. According to the German company, the actual schedule will depend on the strength of DRAM demand and the supply of its partners in Asia. Currently the company has not determined which process technology will be installed in the fab. The empty shell was originally intended to start 12-inch wafer production in 2002, but the plan was shelved in 2001. According to CEO Ulrich Schumacher the project could be fitted out in six months, once Infineon sees some recovery in the DRAM market. Infineon has an 8-inch fab in Richmond that produces DRAM chips using 0.14-micron and some 0.11-micron processes. Infineon also makes DRAM chips at its 8- and 12-inch fabs in Dresden, Germany.

<http://www.infineon.com>

Soitec installs a complete epitaxial and smart cut production line

Soitec, producer of silicon-on-insulator (SOI) wafers and other engineered substrates for use in semiconductor manufacturing, announced it is expanding its manufacturing capabilities to ensure broad industrial availability of strained SOI wafers. Specifically, the company is installing epitaxial equipment in its pilot line facility and a full Smart Cut™ strained silicon germanium on insulator (SGOI) and strained silicon on insulator (sSOI) manufacturing line at its Bernin II site — both located at Soitec's headquarters in Bernin, France. SGOI early production is slated to commence in the fourth quarter of 2004. When at full capacity, the new line will run more than 60,000 200-mm-equivalent wafer starts per year.

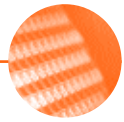
<http://www.soitec.com>

Business News

MEDEA+ faces cash crunch

Medea+, an industry-initiated pan-European program for microelectronics R&D, faces the cancellation or drastic curtailment of newly selected projects as deficit-squeezed European national governments threaten to choke off funding. "The future of next year's projects is in danger," according to Gerard Matheron, office director for the program. Uncertainties in the 2004 budgets of such participating countries as Germany, France, the Netherlands and Italy have thus far thrown 14 of the program's pending projects into limbo. The suspended projects were selected and labeled six months ago following an open call for new proposals. If no funding is forthcoming from the still-uncommitted countries by February, Medea+, according to its bylaws, may have to kill the projects. The 14 threatened projects include security- and safety-related research initiatives for smart cards and automotive applications; a chip set being defined for a global positioning system based on Europe's homegrown Galileo project; and research projects on advanced lithography using nonoptical-based, maskless technologies.

<http://www.medeo.org>



Business News

Intel updates Q4 expectations

Intel provided a scheduled update to the company's Business Outlook for the fourth quarter, which ends Dec. 27.

Intel expects revenue to be between \$8.5 billion and \$8.7 billion, as compared to the previous range of \$8.1 billion to \$8.7 billion. The gross margin percentage is expected to be 62 percent, plus or minus a point, as compared to the previous expectation of 60 percent, plus or minus a couple of points. The company's Intel Architecture business is experiencing solid seasonal growth while demand for communications products remains on track with the company's expectations for the quarter. Intel anticipates taking a fourth-quarter goodwill impairment charge evaluated at \$600 million, related to the Wireless Communications and Computing Group (WCCG). R&D spending is expected to be \$4.4 billion for the year, as compared to the previous expectation of \$4.3 billion. Expenses are expected to be approximately \$2.3 billion, at the high end of the previous

Alliances & Mergers

Merger of ESEC with Unaxis: appeal against lifting of company register injunction

On December 22, 2003, Classic Fund Management AG lodged an appeal with the Justice Commission of the Zug superior court against the judicial decree of December 9, lifting the injunction on entering the merger in the Company Register.

The appeal against lifting the Company Register injunction will have a postponing effect. This means that the merger of ESEC and Unaxis cannot be executed until the appeal hearing has reached a legally binding conclusion. This final decision is expected within the first 6 months of 2004. Unaxis and ESEC recorded this additional delay to the transaction, which was approved at the ESEC General Assembly on October 7, 2003 by 83% of the shares represented at the meeting. Both companies are convinced that the sought-after merger represents the best solution for employees and shareholders alike.

<http://www.unaxis.com>

<http://www.esec.com>

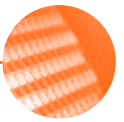
Filtronic into agreement to sell its Solid State business to Teledyne

Filtronic plc, designer and manufacturer of customised microwave electronic subsystems for the wireless telecommunications and defence industries, announces that it has entered into an agreement to sell certain assets of its Filtronic Solid State business, in Santa Clara, California, to Teledyne Wireless, Inc., a wholly-owned subsidiary of Teledyne Technologies Incorporated for approximately US\$12m. The transaction was expected to be closed on or about December 31, 2003 and was subject to customary closing conditions. The proceeds of the disposal, which is of the electronic warfare part of Solid State's business, will be used by Filtronic to accelerate repayment of its senior notes, of which US\$74m is currently outstanding. Filtronic has now bought and cancelled a total of US\$96m of its 10% Senior Notes due 1 December 2005 since 4 February 2002. Following the transaction, Filtronic will retain its Solid State compound semiconductor business in California and employ 19 people there.

<http://www.filtronic.com>

ASML and Photronics announced alliance

ASML MaskTools and Photronics, Inc., announced a strategic alliance to develop a production-ready, mask making infrastructure for ASML MaskTools' CPL™ Technology. CPL is a resolution enhancement technique that enables low k1 lithography at advanced technology nodes. Customers using CPL Technology have the potential to extend the lifecycle of their current 193 nm processes to 90 nm and 65 nm nodes and, thereby, maximize their investments, said both companies. Adoption of CPL technology by semiconductor manufacturers and foundries requires the availability of three critical components: leading edge software, advanced imaging systems and high-end photomasks. ASML MaskTools will deliver the software component through its LithoCruiser® (CPL imaging simulation) and MaskWeaver™ (full-chip CPL mask data conversion) products. ASML will deliver the imaging components through its KrF and ArF TWINSCAN™ platform including the recently announced XT:1250 scanner. Photronics will deliver the mask component through the delivery of high quality CPL



Alliances & Mergers

Soitec and Seika announced Soitec Asian Joint Venture

Soitec, manufacturer of silicon-on-insulator (SOI) wafers and other engineered substrates for use in semiconductor manufacturing, announced it will enter into an agreement with Seika Corporation, its longtime distribution partner in Japan, to form a Joint Venture. To be headquartered in Tokyo, Japan, the joint venture will provide UNIBOND™ SOI wafers—and other engineered substrates manufactured using Soitec's Smart Cut™ technology—to the Japanese marketplace via a full direct sales and support organization. The Soitec Asian JV will also serve both Korea and China.

Under terms of the agreement, Soitec will acquire 70-percent interest in the Soitec Asian JV, while Seika Corporation will retain 30-percent ownership of the new entity. The transaction is expected to be finalized by April 1, 2004—following the close of Soitec's current fiscal year. Together with Soitec's prior investments in the region, this venture ideally positions the company to help its Japanese, Chinese and Korean customers

quickly and easily move to SOI, and other engineered substrates such as strained SOI, as advanced technologies and device requirements continue to emerge.

<http://www.soitec.com>
<http://www.seika.com>

EV Group and AMO GmbH in a nanoimprint lithography cooperation

EV Group (EVG), manufacturer of MEMS, nano and semiconductor wafer processing equipment has entered into a cooperation agreement with AMO GmbH (AMO), on advanced UV-Nanoimprint Lithography (UV-NIL). UV-NIL is a low cost, high resolution, large area patterning process and is competitive with next generation lithography methods. This cooperation will also be the basis of a consortium on UV-NIL with the goal of providing total high volume NIL solutions and infrastructure including equipment, process, and suppliers for chemicals, templates and major semiconductor companies. UV-NIL technology is a promising low-cost replication technology for arbitrary structures at the e-beam resolution limit, said both companies. It will be required to achieve

ever-smaller features sizes that go beyond the limits of conventional lithography techniques to enable "end of roadmap" devices today. research and industrial applications of UV-NIL are driven by emerging fields like chemical and bio sensors, photonics, genomics and especially nanoelectronics.

<http://www.evgroup.com>
<http://www.amo.de>

Communicant declares bankruptcy

The Communicant Semiconductor project has ground to a halt after investors decided to cut their losses.

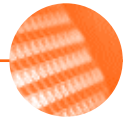
After months of uncertainty surrounding the future financing of Germany-based Communicant Semiconductor, it seems that the company, which never really got going, will be disbanded. The reasons for the collapse seem to be varied, but the venture's principle investors in Dubai appear to have been unwilling to put the further required funds into Communicant. Dubai is currently planning major investment in semiconductor manufacturing infrastructure within its own borders at the so-called Dubai Silicon Oasis. The very slow review process required by the European Union for such ventures has also been cited

Techno News

TI describes SETs to extend life of CMOS

Texas Instruments, working in conjunction with the Swiss Federal Institute of Technology of Lausanne, detailed a potential way to use single electron transistors (SETs) to perform logic functions and dramatically reduce the size and power consumption of future semiconductor devices. A paper presented at the prestigious International Electron Devices Meeting (IEDM) shown that a combination of SETs and standard CMOS transistors can provide enough gain and current drive to perform logic functions at a much smaller scale than will eventually be possible with CMOS alone. SETs can potentially take the industry all the way to the theoretical limit of electrons for computing applications by allowing the use of a single electron to represent a logic state.

Simulations presented at IEDM had been expected to show very encouraging results and addressed random background charges, an obstacle that had effectively stopped major research on SETs, by using a modulation technique that takes advantage of the periodic current voltage characteristic of SETs. The next challenge for researchers is to manufacture reliably many SETs in a CMOS compatible process on silicon. The first application for SETs could be for memory and special applications in metrology, such as primary thermometers and super sensitive electrometers.



Techno News

SEZ unveils new Galileo substrate-etch tool

The SEZ Group, innovator in single-wafer wet-processing technology for the semiconductor industry, announced it is expanding its portfolio of substrate-etch tools with a new system designed to address the growing demand for thinner, higher-performing IC packages. The new Galileo™ system, dubbed the GL-210, leverages SEZ's proven wet Spin-Processing technology in a single-wafer system that delivers superior wafer thinning, surface conditioning and stress relief for two key new sectors—back-end assembly/packaging, and front-end wafer manufacturing. Galileo was specifically designed to help boost device yields of ultra-thin wafers, said the company. In addition to delivering a 2X improvement in wafer/die strength, Galileo allows users to tailor and optimize surface-conditions for specific applications. Currently under evaluation by several key customers, the GL-210 is slated to commence production shipments in the second quarter of 2004.

<http://www.sez.com>

ST unveils new technology to eliminate "soft errors"

ST Microelectronics has announced a new semiconductor technology that virtually eliminates "soft errors" caused by ever-present nuclear particles. These particles increase vulnerability of silicon chips. Soft errors are that make up the earth's low intensity background radiation, they can potentially disrupt the operation of silicon chips and the electronic equipment that depends on them. ST's new technology, called rSRAM, developed at the Company's Central R&D site at Crolles, France, delivers greatly increased immunity to the effects of stray atomic particles without incurring significant cost or performance penalties.

ST has fabricated test chips in 120nm using the new rSRAM cells and subjected them to aggressive testing, which involves bombarding them with high levels of artificial radiation and measuring the resulting soft error rate. These tests (performed at the Los Alamos Neutron Science Centre) have confirmed that ST's rSRAM cells are around 250 times more resistant to soft errors than conventional SRAM cells.

ASML announces industry's first immersion lithography tool

ASML, provider of lithography systems for the semiconductor industry, announced the industry's first immersion lithography system – the TWINSCAN™ XT:1250i – a 0.85 NA, 193 nm pre-production lithography scanner that combines the improved depth of focus of immersion tools with the precision of "dry" lithography systems. ASML has already booked a customer order for the XT:1250i with initial delivery set for Q3 2004. The XT:1250i is the immersion version of ASML's recently announced TWINSCAN XT:1250. Both systems operate at the 65-nm node with half-pitch resolution at 70 nm. The XT:1250 is geared for advanced production, while the XT:1250i allows customers to test and qualify immersion processes, said ASML. The XT:1250 and XT:1250i come equipped with Ultra-k1™, a hardware and software portfolio that enables chipmakers to shrink circuit features, ensure high die yields and maximize bottom-line return.

<http://www.asml.com>

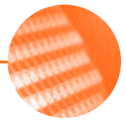
IMEC increases high k/metal gate performance

IMEC, Europe's largest independent microelectronics and nanotechnology research center, announces that they have successfully demonstrated the use of high-k dielectrics and metal gates to values below one nanometer. Achieving this level of electrical performance using materials other than the traditional polysilicon-based counterparts removes one of the industry's so-called 'red brick wall' barriers to advancing semiconductor technology. Using TiN or TaN gates and HfO₂ as dielectric, aggressive scaling down to an 0.8nm equivalent-oxide thickness (EOT) was demonstrated in both nMOS (8.2Å EOT) and pMOS (7.5Å EOT) transistors. The metal-gated devices outperformed their polysilicon-based counterparts in terms of electrical performance parameters, including high conductance, low leakage and reduced threshold-voltage instabilities. Besides the elimination of gate depletion, the metal gates enhanced high-k scalability and significantly reduced gate-leakage by up to three orders of magnitude. Transistor drive current also improved significant-

Intel to enter the television chip market

According to reports, the giant chip manufacturer Intel plans to announce it will enter the projection television chip market in 2004 with liquid crystal on silicon (LCOS), potentially cutting into Texas Instrument's (TI) stronghold on the projection TV market with its digital light projection (DLP) chip. Analysts claimed that Intel's LCOS technology might drop prices for projection TVs a year from now. For consumers, televisions that are now selling for about \$3,000 had been expected to drop to \$2,500 for the holiday season 2004. Now those same projection televisions are more likely to sell for \$2,000 next year, a price drop of a third, analysts said. The announcement is expected to occur during the Consumer Electronics Show (CES) in the USA in January 2004.

<http://www.intel.com>



Rasco and austriamicrosystems introduce 0.4mm Pitch QFN Package

Rasco tested together with austriamicrosystems the new 0.4mm pitch Pogo Pin Contactator and passed successfully the complete evaluation tests. The contact socket that was used for the evaluation has been designed for a QFN 6x6 mm device, running in a SO1000 kit. It contains 48 pogo pins for the contact pads of the device and 16 pogo pins for the big ground pad in the center of the device.

With 400 known devices the contact yield was at 100% and after long term tests of about 3,800 devices the yield still was at about 99.7%. The mechanical precision of the contacts had to be very tight to achieve such good results. The tolerances had to be within +/- 50 µm. The 0.4mm pogo pin contactors are available for all Rasco handlers now.

<http://www.austriamicrosystems.com>

<http://www.rasco.de>

Suss installs wafer bonder and wafer bumping lithography systems

SUSS MicroTec, a manufacturer of production and test equipment for the microelectronics and nano device markets, has recently installed its latest generation of wafer bonder at a leading North American chip manufacturer. The installation represents a noteworthy milestone with this strategic customer and a significant victory for SUSS resulting after vigorous head to head competitive comparisons, said the company. The shipments include key elements of SUSS's recently introduced enhanced bonding technology. Installations have already begun. Sooner in December; Suss Microtec announced that Advanced Semiconductor Engineering Inc (ASE), one of the world's largest semiconductor packaging and testing companies is currently installing multiple 300 mm SUSS lithography systems. The equipment package includes several MA300 Plus Full Field Lithography systems and several ACS300Plus Coat/Develop wafer-processing Clusters, which ASE will use to expand its 300 mm solder bumping capacity and advance its solder bumping technology. The shipments include key elements of SUSS's recently introduced SupraYield™ technology. Installations are scheduled to be completed in Q4 2003

<http://www.suss.com>

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