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Start-up pitches

COLD SPLIT - a laser sabor for crystal it is

W. Drescher
Managing Director
Siltectra GmbH, Dresden, Germany

Abstract
Crystalline materials are grown in large slabs of material, so-called ingots, while industry processes often require wafers, material slices of varying thickness and surface quality. Wafering of brittle semiconductor materials is frequently achieved using diamond- or slurry-based wire sawing processes. These sawing processes not only lead to kerf-loss of potentially precious material, but also impart surface roughness and subsurface damage to the crystal. These aspects of wafering using sawing processes lead to required polishing and grinding steps in the wafer manufacturing process, causing additional material losses and processing costs.
In order to address these issues with conventional semiconductor material wafering, kerf-free technologies have been developed that promise to reduce - if not eliminate - kerf-loss, subsurface damage and grinding steps. In particular, so-called spalling processes use temperature-induced stresses to separate crystalline materials along crystal planes with well-defined thickness. We have developed the COLD SPLIT process that makes use of differences in coefficients of thermal expansion between a brittle material and a polymer adhering to the material surface. Cooling the conjoined materials below the glass transition temperature of the polymer induces stresses that lead to lateral material separation.
Spalling processes, however, tend to be limited in their control of the achieved wafer thicknesses, and tuning the vertical location of crack propagation is complicated. As a solution, Siltectra has developed a laser conditioning process that can be easily integrated into the process chain. Here, the lateral plane of crack propagation is defined through laser conditioning of the material using short laser pulses and high-numericalaperture optics. The plane of laser conditioning can be arbitrarily set and is defined through the focal plane of the focusing optics, which allows for single-micron-precision.

Biography
Dr. Wolfram Drescher received his doctorate at Dresden Technical University's Faculty of Electrical Engineering. He gained his initial experience in industry at Applied Materials Inc. of Santa Clara, California. In 1999, he founded Systemonic AG Dresden, which was later acquired by Philips Semiconductors (now NXP). There, Dr. Drescher held the position of Advance Development Director, and made major contributions to the research, development and market placement of a wide variety of commercial chip sets in the field of mobile communications systems. In 2008, he established the start-up Blue Wonder Communications GmbH, where he held the position of the managing director. The fast growing LTE-chipset developer was acquired by Infineon Technologies AG, respectively Intel Corp. By end of 2012 Dr. Drescher joined Siltectra GmbH, Dresden, as CEO. Under his leadership Siltectra's "Cold Split" process evolved beyond PV application towards utilization in the optoelectronics and high-power semiconductors industries.

Multi Beam Sputtering: the vulgarization of ion beam deposition of thin films

P. Sortais
Ingeneer
Polygon Physics, GRENOBLE, France

Abstract
Polygon Physics introduces a new approach to Physical Vapor Deposition to tackle the growing demand for more complex thin films (multicomponent, magnetic, very smooth & dense, on fragile substrates, etc). Key to bringing the production of such layers from the lab to industrial production are versatile, robust and high throughput systems. Existing technologies are mature and therefore struggle to adapt. With a new technology based on Ion Beam Deposition (IBD) we can offer an extremely versatile system that in addition is up to ten times smaller and cheaper than conventional IBD systems.
Key to our technical solution is a miniaturized low-power ion source (patented). This reliable and maintenance-free source type enables the use of source arrays to create spatially separated and individually controlled sputtering points, instead of a single large one. Each point can thus be a different target material, and in combination with a smart geometry this enables full control of the deposition profile, in thickness and in composition.
The use of a multitude of small sources instead of a single large one also generates an enormous flexibility in terms of the size and geometry of the samples that can be coated with this technology (from wafers to roll-to-roll, from wires to tube interiors).

Biography
Pascal Sortais is an internationally recognized ion source expert and co-author of ten patents. His approach illustrates his passion for creating bridges between basic research and industry. In parallel to a career in accelerator physics at CNRS (France), Pascal Sortais has been consultant for various companies, is before becoming an entrepreneur. Polygon Physics, founded in 2014, is his second company.

Nano and macro porous membranes à la carte

M. Lelonek
CEO
SmartMembranes GmbH, Halle, Germany

Abstract
Nano porous anodic alumina is a widely studied material that is used for corrosion protection of aluminum sur-faces or as dielectric material in microelectronics applications. For more than 40 years porous alumina has been the subject of investigations. It exhibits a homogeneous morphology of parallel pores which grow perpendicular to the surface with a narrow distribution of diameters and interpore spacings, the size of which can easily be controlled between 20 and 400 nm. Monodomain porous alumina templates with very high aspect ratios can also be synthesized by using lithographic preparation. The combination of self-assembly and lithography allows the preparation of porous alumina templates with various configurations of pore arrangement that are not accessible by other state-of-the-art methods.

Macro porous silicon, prepared by an electrochemical process, has also gained interest in research for many applications which have a demand for mechanical and chemical stability as well as a high order of the pores. The pore diameters can differ from 700 nm up to 10 µm using lithographic pre-structuring. The standard deviation of pore diameter and interpore distance is lower than 5 %. Because of the lithographic pre-structuring technique macro porous silicon with its high ordered structure represents an ideal 2-D photonic crystal (PC) exhibiting novel properties for the propagation of infrared light within the pores.

Because of the above mentioned unique properties, nano porous alumina and macro porous silicon can be used in a wide range of applications, such as filters, as platforms for multi-functional and micro mechanical sensors, for fuels cells, as platform for microsystems technology and microfluidics, and especially as templates for the fabrication of nanometer-scale composites, such as nanotubes or nanowires by electrochemical deposition or by using polymer melts.

Biography
About the presenter:
Monika Lelonek studied chemistry at the Westphalian Wilhelms-University in Muenster. She focused on physical chemistry and started to work on her PhD thesis in the fields on nano porous alumina layers and their behavior on non-planar surfaces. During that time she founded the company SmartMembranes with Dr. Petra Goering in the city of Halle. As the CEO of that company she is responsible for the finances and sales.

About SmartMembranes:
SmartMembranes was founded by Dr. Petra Goering und Monika Lelonek in Halle (Saale) on 20th July 2009 as a spin-off from the Fraunhofer Institute for Mechanics of Materials. The company is the leading manufacturer of high-ordered porous materials from alumina and silicon with defined and adjustable membrane properties and structure parameters. SmartMembranes manufactures not only membranes on customers' request, they also develop new processes and products around the core business.

The Ferroelectric Memory Company: Bringing Ferroelectrics to Fabs

S. Müller
Co-founder
The Ferroelectric Memory Company (i.G.), Dresden, Germany

Abstract
FMC will be formed to commercialize a groundbreaking material innovation to build next generation embedded memory products. Our proprietary technology enables customers to plug-in FMC memory IP right in their advanced System-on-Chip architectures.

Today, Fabless Chip Companies and IDMs are not able to scale down their System-on-Chip (SoC) designs in the same way as transistor logic is surging ahead. This is due to the fact that all current non-volatile memory solutions have scaling problems, so that SoCs cannot be manufactured in a cost- and area efficient way. The customer problem is therefore a lack of scaling and cost reduction in the embedded memory sector.

FMC will offer an embedded memory solution at 28 nm and beyond uniquely addressing the scaling issues in advanced system-on-chip architectures. Our single-transistor FeFET solution based on ferroelectric hafnia enables chip manufacturers to implement embedded memory blocks at the latest SoC technology nodes. FMC will deliver IP products (IP cores) to fabless customers and Integrated Device Manufacturers (IDM) around the world.

For 2018 YOLE is reporting that the emerging nonvolatile memory (NVM) market is crushing the 2 Billion USD line. The market will grow at a CAGR of + 46% with mobile phones, smart card and enterprise storage as main growth drivers. FMC will enter this market with products that ideally meet the growth driving applications by focusing on advanced energy efficiency standards and currently unresolved scaling issues.

Biography
Stefan Mueller received the joint master's degree in Microelectronics from the Technical University Munich, Germany, and Nanyang Technological University Singapore in 2011. He also holds a diploma degree in Mechatronics and Information Technology as well as a bachelor's degree in Mechanical Engineering both from Technical University Munich, Germany (2011/2008). In 2011, he joined NaMLab gGmbH, Dresden, Germany, as a PhD student working on ferroelectric devices. Since 2015 he is project leader of a publicly funded research transfer project which will result in the formation of FMC, "The Ferroelectric Memory Company".

UVphotonics - Design, development and marketing of UV LED-Chips & packaged LEDs

N. Lobo-Ploch
Wissenschaftliche Mitarbeiterin
Ferdinand-Braun-Institut Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany

Abstract
The focus of UVphotonics is the design, development, and marketing of highly efficient and reliable UV-B and UV-C LEDs for applications in disinfection, medicine, sensing and industrial production. The product portfolio comprises standardized products as well as UV LEDs tailored to customer-specific demands. The profound technological expertise of the UVphotonics team ensures that customers are provided with the most suitable and efficient LEDs for their applications. UVphotonics is in the process of being founded as a spin-off from the Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik and the Technische Universitaet Berlin, and is supported by the German Federal Ministry for Economic Affairs and Energy.

Biography
Neysha Lobo-Ploch has been working on the development of UV LEDs since 2008. Initially as a scientist in the work group of Prof. Dr. Michael Kneissl at the Technische Universitaet Berlin, her work focused on the development of new chip-designs to increase the light extraction efficiency of UV LEDs and to improve the thermal management of the devices. Since April 2014, she has been working at the Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik on the chip design and packaging of UV LEDs and is also responsible for customer inquiries. Her technological expertise in the field of LEDs enables her to design customer specific solutions. In the spin-off UVphotonics, Neysha Lobo-Ploch will be the Chief Executive Officer and will be responsible for the marketing and sales of UV LEDs.

An Integrated Electroluminescence, Photoluminescence and Thermography Inspection Tool for Wafer and Semiconductor Characterisation

M. Regehly
CEO
greateyes GmbH, Berlin, Germany

Abstract
Luminescence imaging has become a powerful tool for quality control of wafers, processed solar cells and thinfilm substrates. Electroluminescence (EL), Photoluminescence (PL) and Dark Lock-In Thermography (DLIT) are the most common imaging methods,delivering spatially resolved informations about material parameters and allowing to detect cracks, hot spots, impurities and shunts fastly and in a non invasive fashion.
Typically EL and PL measurement capability are integrated in the same instrument, a powerful laser source serves for optical excitation of the sample in case of PL characterization. DLIT requires an alternating current, an thermal infrared sensitive camera and a precise synchronization between image acquisition and driving current. For the reason of complexity and different requirements of the individual methods, a unified tool has not been proposed. On the other side, the gathered information from EL, PL and DLIT are complementary and can provide a more comprehensive understanding of the device under study.
The presented system integrates EL, PL and DLIT measurement capability with a low number of components. It employs a HighPower LED based light source instead of a laser for excitation, making the system more flexible, safe in its usage and cost-effective. We report about the design of the system and example characterisation of preprocessed wafers and finished solar cells.

Biography
Mr. Regehly studied Physics at University of Ilmenau and at Humboldt-University Berlin. He wrote his diploma thesis about the HDAC instrument onboard the Cassini spacecraft. For this purpose he had worked at German Aerospace Center (DLR) in Berlin und at Laboratory of Atmospheric and Space Physics (LASP) in Boulder, Colorado. In the following he did a doctoral degree in physics at Humboldt-University Berlin about photodynamic cancer therapy. In 2007 he founded greateyes, a company developing and manufacturing scientific cameras and optical inspection systems. In his current position as CEO, Mr. Regehly directs the activities of the innovative, growth-oriented high tec company.

Ultra Sniffer - New atmospheric leak detection method

R. Brockmann
Dipl.-Ing. (FH)
Dipl.-Ing. (FH) Robert Brockmann, UST-Verfahren, Greifswald, Germany

Abstract
The test sensitivity of classic sniffer test methods is limited by the helium noise in the air, but by reducing the atmospheric helium noise from 5 ppm to 10 ppt the test sensitivity of the classic sniffer test method can be significantly improved by the factor 500.000.

The at the at the Max Planck Institute for Plasma Physics (IPP) developed Ultra Sniffer Testgas method (UST) has successfully been applied in the Nuclear Fusion domain. In particular it was used for tests during the construction of the Wendelstein 7-X fusion experiment at the Max Planck Institute for Plasma Physics (IPP) in Greifswald. It was shown that leaks at normal pressure (1013 mbar and 20°C) up to 10^{-9} mbar*l/sec are easily detectable. This means that, with the UST-Method, leaks with a theoretical loss of gas of 5 cm^3 in 30 years are well within the detectable range. The UST method is ready for use in the non-fusion domain. New application areas are for example in the area of material sciences and electronic devices. However, the application in all industry domains requiring leak detection and localization in pre-production seems promising, in particular for ad hoc testing.

Biography
Former employees at the Max Planck Institute of Plasma Physics in Munich and Greifswald and project manager of a start-up from the Max Planck Institute.

How More-Than-Moore technologies impact every day applications

J. Wetzel
Distinguished Member of Technical Staff
Novati Technologies, Austin, United States

Abstract
Many of today's systems are beginning to hit their performance limits based on conventional packaging. Platforms in medical electronics, exa-scale computing, telecommunications, night vision and wearable electronics are all key platforms that will be significantly impacted by the implementation of 2.5 and 3D packaging. As sensors are integrated into more applications, the need for a higher level of integration becomes even more important. Novati's emerging packaging capabilities are a national asset that promises to become key in addressing many of these current and future needs.
Novati has developed world leading expertise in 2.5 and 3D packaging. This includes integrated circuits and platforms requiring mixed technologies & heterogeneous materials such as III-V on silicon, etc. Further, by leveraging its advanced copper backend, Novati is able to take incoming wafers before interconnect, complete the metal routing interconnection and perform the wafer-scale packaging. This direct from foundry to packaging capability is an exceptional advantage within the U.S. allowing more advanced packaging solutions to be utilized while maintaining quality, yield and security.
In addition to copper backend process, Novati has three, unique, first-in-country packaging technology elements that are enabling for 2.5D/3D packaging:
1. FaStack® stacking technology
2. Direct Bond Interconnect (DBI®) technology
3. ZiBond® Direct Wafer Bonding
Using these elements, Novati is able to integrate with vertical interconnects and pitch far in excess of the rest of the industry having assembled devices with more than 10 million vertical interconnects per layer and up to 9 device layers within a 3D architecture. This presentation is designed to summarize each of these enabling technologies, and the value they provide for advanced 2.5/3D packaging, today.

Biography
Author's name: Jeff Wetzel, Ph.D.
Title: Distinguished Member of Technical Staff
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jeff.wetzel@novati-tech.com

Dr. Jeff Wetzel is the Senior Staff Technologist responsible for technical inputs for business development and identification of new process technology to enhance Novati's capability. He performed Technical/Project mentoring of Advanced Memory, BioMEMS and 3D TSV programs at SVTC. Technical Management of advanced transistor programs in ATDF/SeMaTech including MUGFET, mobility enhancement, 3D TSV, Dual Work Function/Metal Gate and Phase Change memories. Experienced in introducing new materials/processes in CMOS fabs from Proof of Concept Phase through Manufacturing Transfer. Experienced with Design of Experiments methodology for process integration/development and yield enhancement. With more than 25 years experience in leading and managing advanced CMOS process technology development at IBM, Motorola, Tokyo Electron and SeMaTech.

Dr. Wetzel completed his Post Doctoral Research at IBM T.J. Watson Research Laboratories, Yorktown Heights, NY. His Ph.D. in Metallurgical Engineering, M.S. in Metallurgical Engineering, and B.S. in Chemical Engineering, all from Columbia University, NY, NY.

Smart basestation antenna for next generation mobile communication

P. Meyer
Managing Director
Airrays GmbH, Dresden, Germany

Abstract
Driven by the rise of smartphones and the mobile internet, the transmitted data volume is doubling every eighteen months while the revenue of the operators remains flat. Airrays addresses this problem with a game changing radio technology for mobile communication base stations. Instead of broadcasting a signal to a complete cell, Airrays antennas are focusing the radiated signal directly to the user leading to 10 fold lower radiated power. Additionally multiples of such beams can be created from the same antenna leading to a 10 fold better capacity of the cellular system. Airrays has found a unique modular approach to create these complex antennas which can be connected to the network via a digital interface. Airrays is planning to create, produce and sell complete antennas units or its key components to antenna manufacturers or cellular infrastructure provider. This new kind of base station antenna can already be used now but will ultimately replace current systems when the next generation mobile standard, 5G is deployed. This will become a multi-billion euro market. Airrays is currently in the seed phase and will create a first prototype within one year and a sellable product one year later. Revenue will be around 3 Million Euro in 2018 and reach more than 100 Million Euro in 2020 when 5G will start to be deployed. The Airrays team consist of serial entrepreneurs that have already done two other start-up companies in the field of wireless communication and have up to 25 year experience in this field as well as in semiconductors. These experiences founders are supplemented by three PhD graduates from the Vodafone Chair of the Technical University of Dresden. It is planned to grow the team to 30 employees within the next two years.

Biography
Before founding Airrays, Peter worked as managing director and VP of the Dresden Design Center at Intel Mobile Communications. He was co-founder and managing director of Blue Wonder Communications GmbH where he and his team developed leading edge LTE IP before the company was acquired by Infineon and later by Intel. Having held leading positions at Intel, NXP, and Philips, Peter brings more than 25 years' experience in wireless communications and digital signal processing to Airrays. He received his diploma and PhD both in physics from University of Göttingen in 1983 and 1987, respectively.

Easy Smart Grid - opportunities in energy system transformation

T. Walter
Managing Director
Easy Smart Grid GmbH, Karlsruhe, Germany

Abstract

Background

Our energy system is based on fossils. Coal, oil and gas accounted for 68% of electricity and 81% of primary energy in 2012/13 (IEA 2014). Coal, oil and gas companies were valued at 5 Trillion $ in 2014. De-carbonization starts now (G7: 100% by 2100).

Transformation

Fossils provided energy and storage. Tomorrow energy will be supplied by solar, wind, hydro and biomass, and storage by pumped hydro, P2G, batteries and customer flexibility. A new (smart) grid operating system is needed.

Positioning

We focus on creating high added value in the first market segment to be transformed. Transformation of grid islands and island grids creates value as renewables are cheaper than oil, and our technology coordinates all grid actors. Future extension to cellular grids can be expected.

Solution

We create a real time market and price in a grid cell, the most efficient way to establish balance by influencing production and consumption. Our patented technology ensures real time performance and stability, data protection and resiliency, and minimum investment in ICT infrastructure. Most intelligence resides in the controllers of user devices ("Smart Grid on a chip"). Our solution is more efficient and cost effective than any other smart grid technology.

Products

We develop and sell the "Operating System" plus Smart Controllers for Automated Demand Response and ESG meters for billing. We plan to cover market by partnerships and licensing. In the long term, every flexible device (fridges, laptops) will include the function under our license for this energy IOT (Internet Of Things) technology.

Status

Easy Smart Grid was founded in 2014 and won 3rd prize as European Smart energy start-up from EIT ICT. Technology risk is low, IP has been filed in 2015, and pilot partners are being developed.

We plan to implement the business plan in two phases: Development and pilot demonstration 2016/17, industrialization and rollout 2018/19.

We look for partners for investment and business development.

Biography

Thomas Walter studied electrical engineering at the Universities of Karlsruhe and Essex (Diploma in 1982) and earned a PhD (Dr.-Ing.) for sensor technology research from RWTH Aachen in 1989. From 1983 to 1989 he worked for Cambridge Consultants Ltd. (An Arthur D. Little Company) on breakthrough technology and innovation consulting. 1989 to 1993 he was a product manager and assistant to the MD at German Philips subsitiary BTS. 1994 to 2000 he worked at a Dresdner Bank consulting subsidiary on banking, innovation financing and business transformation projects. 2000 to 2011 he was Associate Director at engineering consultancy Altran Group, where his responsibility included all work for the semiconductor subsidiary of Carl Zeiss. 2011 to 2013 he started and managed a subsidiary of Wirsol Solar AG with a focus on diesel substitution (first 650 kW of PV on the Maldives) and PV integration. He manages Easy Smart Grid GmbH since its foundation in April 2014

Sovtest Micro LLC

T. Krekoten
General Director
Sovtest Micro, Moscow, Russian Federation

Abstract
Founded in 2009 as a hi-tech startup company with support of #1 test equipment supplier in Russia, Sovtest Micro LLC has become a commercially viable semiconductor test equipment designer and manufacturer in the Russian and CIS markets.

Located in Zelenograd, Moscow region, at the heart of Russian semiconductor industry, Sovtest Micro team has accumulated 250+ years of fruitful engineering experience and is ready to share it with the rest of the World.

Our invariable motto is WE DO LIKE WHAT WE DO!

Biography
General Director in LLC «Sovtest Micro»
Place of birth: Moscow, Russia
Date of birth: 21/03/1980
Education:
In 2002 graduated from the National Research University of Electronic Technology in Zelenograd, Moscow region, Russia
In 1997 graduated from secondary school with advanced study in physics and mathematics with silver medal award in Zelenograd, Moscow region, Russia

Career:
From 2011 till present - LLC Sovtest Micro: General Director, Co-owner, Zelenograd, Moscow region; business occupation - semiconductor test equipment
From 2002 to 2010 - OJSC Angstrem: last position held: Department head of manufacturing process automation

Wine fermentation without worries

M. Blazinsek
CEO
Enolyse d.o.o., Brežice, Slovenia

Abstract
Winemakers lack time to constantly measure sugar during wine fermentation, because they have to focus on the harvest. Average winemaker in our segment spends 3h per day just for measuring sugar. They hardly ever analyze their data after the harvest, because they keep it in their mind, notebooks or on tanks, which is really unordered. If winemakers not keep track of sugar levels during wine fermentation this can affect wine quality.

The solution is an IOT platform, which helps winemakers to track their work and measurements in the wine cellar quickly and easily. EnoMeter, smart sensor, helps them to track wine fermentation automatically and continuously by measuring sugar level and temperature every 2 hours. With EnoMeter they save time, improve wine quality and consequently increase wine price per bottle.

We've developed a mobile app for Android and iOS, which helps winemakers to easily enter and track manual measurements, fining agents, racking, filtrations and track wine fermentation during their work in the wine cellar. We've also invented our own method for measuring sugar in liquids, which we've implemented into our smart sensor EnoMeter. EnoMeter measures electro-chemical properties of wine. Sensor sends all the data to the EnoApp via Bluetooth communication.

Biography
Martin Blazinsek has graduated at Faculty of electrical engineering, University of Ljubljana in 2010. After his study he has been working 3 years at the same faculty as a researcher in Laboratory of Modelling, simulation and Control and has developed algorithm for auto-tuning PID controllers.

In 2013 he co-founded startup Enolyse, where he works as CEO and also works on marketing and sales.

Production of Carbon NanoTubes with defined electronic properties for innovative applications in microelectronics

V. Bezugly
CRO
ProNT, Dresden, Germany

Abstract
For the development of the semiconductor industry and novel applications there is an urgent need for new materials which allow further miniaturization of active elements and enable increased energy efficiency and reliability of devices operation. Carbon nanotubes (CNTs) are nanometer-size objects and have extraordinary electronic and thermal conductivities. They are very attractive class of materials for the use in innovative electronic devices like CNT-based computer chips, sensors, displays and other. However, conventional processes to produce CNTs are not optimal, they yield mixtures of metallic and semiconducting CNTs, having also admixture of other substances like catalyst. This causes failures and dysfunctions of the CNT-based applications.
Start-up project ProNT is engaged in the Production of carbon NanoTubes with defined electronic properties. Our products are "ready-to-use" materials, which have a high potential in the application in innovative electronic devices. Our know-how is a new method of catalyst-free production of CNTs with defined electronic properties, either semiconducting or metallic. Our production procedure yields high quality CNTs allowing the direct application by customers without a pre-treatment. We aim to provide optimally designed CNTs for the individual needs of customers from R&D and industry.
The use of CNTs in microelectronic products of next generation will make these products more competitive in the fast changing field of electronic devices. They will allow our customers to keep the leading position on the market and to fulfil the needs of their end-customers.

Biography
Start-up ProNT is the spin-off project of the University of Technology Dresden, chair of Materials Science and Nanotechnology. We are an early stage project and we are looking for partners and potential customers from the microelectronic branch.

Novel 3D real-time visualizations for industry

H. Wojcik
CEO
3D Interaction Technologies GmbH, Dresden, Germany

Abstract
Today's hard- & software enable a new era of visualization even on conventional laptops and tablets: 3D realtime visualization solutions are the future state of the art for industrial applications and customers. Typical products are 3D- configurators, virtual exhibits and 3D-viewers as part of planning software, from small pumps to complete factories that are actually to be built.

For instance, a physical exhibit cannot show different options and is not available anywhere/ anytime, particularly if it's gigantic, or not even built. With a conventional static picture or video, however, one is fixed to perspective and timeflow: One cannot interact, zoom inside, arbitrarily move around, just like we know it from the real world. That makes it often hard for end customers to understand technical products.

Also, raw CAD (computer aided design) data requires complex software and hardware and is therefor not the right choice for marketing or standalone industrial solutions, e.g. a control panel.
We use raw data that is typically available from construction (CAD). However, we then combine advantages of 3D computer game engines with those of video and computer graphics. Additionally we use our own software tools to achieve high performance (on simple hardware + mobile devices), interface access (SAP, ERP etc.), as well as partially automated CAD import.

The resulting solution is, generally spoken, video and interactive real-time 3D model in ONE. The spacial, technical and visual understanding for end customers or equipment users is much higher, their involvement is higher and thus the presentation is more convincing, or the application is easier to handle, respectively.

3D-solutions are available at the place and the time desired by the end customer, and run on local or mobile devices, even plugin-free in the web. Also, the final software product may contain interfaces to the construction or data base of companies, which saves money.

Biography
Born in Dresden, Germany

Age: 35

Education: Electrical Engineering, PhD in Semiconductor Manufacturing Technology

Experience: 7 years R&D BEoL, 5 years in leading a software business (started with 4 people in 2010)

Other: songwriting and artist performance (piano, voc)

Nano-Join

T. Röhrich
Founder
Nano-Join, Berlin, Germany

Abstract
Nano-Join produces and sells newly designed and patented sinter pastes, which will mainly be used in the connection technology. After five years of development at the Chair of Joining and Coating of the TU Berlin, the materials are now ready to be commercialized and be produced on an industrial scale.
The startup just received an EXIST entrepreneurship grant from the Federal Ministry of Economics and Energy.

The developments in electronics and micro-technology are characterized by increasing miniaturization and a growing complexity of components. The results are higher power density and thus an increase of the operating temperature of electrical components. Occurring local overheating can lead to failure of the solder joints. Since electronic modules include temperature-sensitive elements it is usually not possible to use higher melting and therefore more reliable soldering materials.

The silver sinter pastes developed by Nano-Join have been designed for applications in power electronics and allow for connections with highest thermal/electrical conductivity at simultaneously low process temperatures and thus creates more reliable and durable connections.
Due to nano effects, dense and massive silver layers can be created pressureless below 250° C on various surfaces, e.g. directly on copper.

Nano-Join is currently setting up development projects with large industrial companies that consider the technology state-of-the art and very promising.
According to current market studies, the overall market volume for interconnection technologies in power electronics was around $10bn in 2012 worldwide at an annual growth rate of 10%. As established methods like wire bonding or conventional soldering are expected to remain predominant processes, experts estimate the substitution potential at around 10%, leading to an overall market volume up to $1.3bn in 2020 for sintering processes.

As a team, Nano-Join has more than 10 years of relevant industrial and entrepreneurial experience.

Biography
2009: Graduation as Dipl.-Ing. in Material Science/ TU Berlin

2009 - 2015: Research Assistant at Chair of Joining and Coating Technology/ TU Berlin

2012 - 2015: Head of Group Microjoining & Laserprocessing at Chair of Joining and Coating Technology/ TU Berlin

Since May 2015: EXIST scholarship holder at TU Berlin/ Start-up project: Nano-Join

INVEST - Investment Grant For Venture Capital

H. Isken
Officer (416)
Federal Office for Economic Affairs and Export Control (BAFA), Eschborn, Germany

Abstract
The Federal Ministry for Economic Affairs and Energy started the INVEST - Investment grant for venture capital in 2013. Aim of this program is to help young and innovative companies to find early stage investors. Business Angels play an important role in early stage financing. The aim of INVEST is that these companies can acquire more and larger investments from business angels. The grant pays an investor 20% of his investment into a young innovative company.

Biography
Hardy Isken has administrated the investment grant INVEST - Zuschuss für Wagniskapital" for the Federal Office of Economics and Export Control (BAFA) since it started in 2013. He oversees the application process and audits all relevant contracts on the investor´s side. After working as a Key Account Manager for Apple in Ireland and as a Business Development Manager for the polish IT company Comarch AG he had co-founded a finance start-up.

Sub-wavelength Holographic Lithography

V. Rakhovskiy
CTO
Nanotech SWHL Gmbh, Zurich, Switzerland

Abstract
Nanotech SWHL offers investment opportunity in revolutionary photolithography - Sub-Wavelength Holographic Lithography for production of IC, MEMS, Sensors.
The technology is based on unique mathematical apparatus.
It allows to generate images not possible with traditional projection lithography and provides much lower cost of ownership for anybody who is or wants to engage in the production of MEMS, Sensors, IC's.
Physical concept of the technology has been proven theoretically and experimentally. Test topology was produced on photo resist.
4 RF Patents and 1 US Patent received for the technology; 3 US Patents approved; 2 US patent applications pending
Partnerships established with several leading European semiconductor companies who have expressed interest in the project.

Biography
Professor Rakhovskiy graduated from Physical Chemistry Department of the Moscow Institute for Steel and Alloys.
Ph.D. degree in physical electronics from the All-Union Electrotechnical Institute and the Doctor of Science Degree in Plasma Physics from the Leningrad State University.
Full Professor in plasma physics and chemistry
Holds more than 90 patents in the field of high-voltage technology, physical electronics, surface analysis, microelectronics and nanotechnology

Professor V. Rakhovsky founded Project SWHL in 2002.

Innovation for independence

H. Westerlund
Sales Operations Coordinator & Mealtime Consultant
Bestic AB, Stockholm, Sweden

Abstract
Bestic AB was founded in Sweden, 2004 by Sten Hemmingsson who himself was in need of a good assistive eating device due to complications from Polio. The company has so far been privately funded and our main product, the eating assistive device Bestic®, was launched in 2012. As of today, we have sold approx. 250 units and have distributors in 7 European countries and also sell directly to customers in the US.

According to the EU project "SILVER"; 0.2% of the population need mealtime support and have difficulties eating independently. Being dependent has a negative impact on one's confidence, dignity and appetite. Research shows that eating difficulties lead to malnutrition, which is a serious problem for patients and society as a whole. Statistics show that the healthcare costs for treating malnutrition are as high as the costs for treating obesity.

Bestic is a small, well-designed robotic solution that can support most mealtime situations for those who desire independence. It is easy to use and easy for nursing staff to manage and offers a whole new concept and generation of mealtime support. The price of Bestic is 5 300 EUROS which corresponds to approx. 1.7 EUROS/meal (based on eating three times per day during three years). In comparison, the cost of being fed by a caregiver is approx. ten times more: 18 EUROS/meal.

Biography
About Sten Hemmingsson:
MBA. Senior management positions in engineering companies in the transport and materials handling sectors. Project director for major installations of railway safety and control systems. Entrepreneur. Born 1938.

About Hanna Westerlund:
Sales Operations Coordinator & Mealtime Consultant. Project manager with experience within marketing, implementing innovations and sales at both universities and companies.
Born 1980.

Analog Power Lab - Automation solutions for micro-electronic ICs and full system testing

P. Cantagrel
Hardware engineer
Analog Power Lab, Sophia Antipolis, France

Abstract
Analog Power Lab is the specialist in validation of complex electronic products. Provides test solutions and automation. Develops firmware and graphic interfaces for computer and smartphone applications.
Electronic products validated by Analog Power Lab are applied in various domains such as: audio & video, defence, aircraft, space, automotive, medical, power management, renewable energies, etc.
Currently, the pace of new micro-electronic devices development and their production is faster and faster. Moreover, we observe the surge of ICs complexity. Therefore, the main struggles of global semi-conductor foundries are: the lack of time to meet the market demand and provide swiftly their customers with reliable products; maintaining of their market share in the same time.
Analog Power Lab innovative solutions for mixed-signal testing are based on automation software development. In this way, the time allocated to the validation is minimized and the cost reduced due to generic stored sequences.

Biography
Pierre Cantagrel
CEO and co-founder of Analog Power Lab, senior hardware engineer
Analog Power Lab S.A.S., Test engineering/Software development, Sophia Antipolis, France

Biography
Pierre Cantagrel is an expert in electronic/micro-electronic development, hardware testing and validation. He has 12 years of experience in these domains.
P. Cantagrel obtained his Bachelor of Science degree in Microelectronics in 2004, at POLYTECH'SOPHIA. He had been acquiring valuable skills in Electronics development in different high-tech companies. Afterwards, he joined Texas Instruments France as Mixed-Signal Validation Manager and works for major phone OEM's during more than 7 years.
This strong professional experience enabled Pierre Cantagrel to co-found the company Analog Power Lab, an electronic laboratory in Sophia Antipolis. At Analog Power Lab, he manages full-validation IC's projects.

Anna Hudeckova
Marketing Manager / Export Sales, International Business
Analog Power Lab S.A.S., Test engineering/Software development, Sophia Antipolis, France

Biography
Anna Hudeckova has obtained her Bachelor's Degree in International Business at the University of Economics in Prague and her Master's Degree in International Business at the University of Nice Sophia Antipolis in France in 2013.
She has a significant experience in multicultural international environment.
Since February 2015, A. Hudeckova is in charge of marketing development and export sales at the start-up company Analog Power Lab.

JenaBatteries - Novel Metal Free Aqueous Redox Flow Batteries

S. Schneider
Managing Director
JenaBatteries GmbH, Jena, Germany

Abstract
Issue to be solved
Low-cost sustainable and long-lasting energy storage systems are the major bottleneck in the renewable electricity generation industry.

Key Investment Highlights
The deployment of novel, metal-free substrates developed by JenaBatteries becomes the desired catalyst to reduce the cost of REDOX FLOW battery systems substantially. Fully industrialized the costs per kWh storage capacity will be EUR <500, significantly lower than all other stationary battery technologies.

Unique Selling Proposition
1 Cost leader by newly patented electrolyte in commercially available and long-established redox-flow-battery concept,
2 Simple, water-based electrolyte.
3 No heavy metals or rare elements.
4 Unlimited capacity by mature redox-flow-system design,
5 Low material cost.
6 No self-discharge.
7 No explosives,
8 Easy to scale-up.

Company
JenaBatteries' technology is based on several years of national and international battery research of one of the leading polymer research groups. The company employs industry professionals of chemists, hardware, software and material. JenaBatteries is profiting from the progress in lithium batteries, fuel cells and redox-flow developments in the last decades by employing experts of all of these segments. The company focuses on hardware, software and system design. The in-house development of the electrolyte is enhanced by an intensive collaboration with the University of Jena/Schubert group. With the first kW/kWh scale demonstrator unit the team demonstrated the commercialization potential of the system.

Commercialization Strategy
The key advantage of JenaBatteries' patented technology is the low-cost, mass-manufacturing potential. Based on huge economies of scale in modern mass manufacturing of organic substrates, JenaBatteries will be able to establish cost leadership in the stationary battery business. Market launch is expected in 2017. Structured product roadmap, partner list and targeted bill of materials per product are available.

Biography
Steffen Schneider

Executive Summary
1) Entrepreneur and Managing Director
2) Business Development and M&A within 2004 - 2013
 to support sales growth from US$ 500 mill to US$ 800 mill
 to support EBIT increase from US$ 25 mill to US$ 75 mill
3) Total of US$ >500 mill in 8 major M&A disposals
4) Total of US$ >400 mill in 4 crucial corporate finance transactions
5) Total of US$ 100 mill in 11 main M&A investments
6) Total of transactions 1999-2013: >30
7) Content focus:

a) Raise of capital (several IPO's, bonds, convertible bonds, capital increases)
b) Investments in privately hold and quoted companies
c) Support & integration of newly acquired companies
d) International business development of in the tech industry
e) Founding start-ups in the high-tech industry & energy markets

Since 2013 Start-up Investor, Managing Director & Shareholder of JenaBatteries GmbH
Responsibility for (a) Financing, (b) Financial and business planning and
(c) Project management and (d) Strategic partnerships

2013 - 2010 Vice President Strategy, Business Development, Innovation Management, Internal Audit of JENOPTIK AG (quoted, German TecDAX, US$ 780m sales)
Responsibility for (a) Group's strategy, (b) Key growth projects, including M&A activities, (c) Key account management, partnerships with leading investors combined with product roadmap design of the group and (d) Internal audit

2010 - 2004 Vice President Corporate Development, M&A, Investor Relations of JENOPTIK AG
Defining major catalysts for growth. Focus on (a) Strategies to open up international markets, (b) Economies of scale, (c) Value chain, (d) Round-up of product portfolio

2004 - 1999 Manager IPO-Management & Capital Markets and
Head of Investor Relations of DEWB AG & JENOPTIK AG

1999 - 1997 Consultant Change Management with Accenture in Frankfurt & Chicago
Restructuring projects and Customer Relationship Management projects

Mr. Schneider holds a diploma in Business Administration at Friedrich-Schiller-University in Jena, Germany; Focus: Marketing, Taxes and Intercultural Business Communication