

SEMICON® EUROPA

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Smart MedTech

Welcome Remarks



L. Altimime
President
SEMI Europe, Berlin, Germany



Abstract

Welcome Note

Biography

As President of SEMI Europe, Laith Altimime leads SEMI's activities in Europe and the Middle East and Africa (EMEA). Altimime has P&L responsibility as well as ownership of all Europe region programs and events, including SEMICON Europa. He is responsible for establishing industry Standards, advocacy, community development, expositions, and programs. He provides support and services to SEMI members worldwide that have supply chain interests in Europe. He manages and nurtures relationships with SEMI members in the region and globally as well as with local associations and constituents in industry, government, and academia.

Altimime has more than 30 years of international experience in the semiconductor industry. Prior to joining SEMI in 2015, He held senior leadership positions at NEC, KLA-Tencor, Infineon, Qimonda and imec. Altimime holds an MSc from Heriot-Watt University, Scotland.

Opening Remarks



H. Leistner
Business Development
Fraunhofer EMFT, Munich, Germany



Abstract

Non applicable

Biography

Henry Leistner is holding a Master's degree in Semiconductor Physics and in Industrial Engineering. His previous research activities focused on yield enhancement methods at X-FAB Silicon Foundries. Further he investigated improvement strategies in customer supply allocation with machine learning at Infineon Technologies. He led since 2018 the silicon components team of the Microdosing Systems department. With beginning of 2022, he is responsible for cross-departmental programs in Business Development department of Fraunhofer EMFT in Munich. Additionally, he is pursuing a PhD in Electrical Engineering at Technical University of Munich.

Semiconductor Companies Shaping the Transformation of the Healthcare Industry with Optical Solutions



J. Milnikel
EVP & GM BU Image Sensor Solutions
ams-OSRAM AG, BU Image Sensor Solutions,
Munich, Germany



Abstract

The medical industry is undergoing a transformation that will impact the way people care about their personal health. In a social environment of an aging but tech savvy population, with birth rates at a minimum in decades, it becomes increasingly important to redefine the way we understand personal health.

Emerging technologies and sensors play a key role to bring diagnosis and treatment out of the traditional channels, enabling personalized, participative and predictive medicine in an agile and cost efficient health system.

Jens Milnikel will explain his vision on a new era of personal healthcare and how ams-OSRAM sees precision medicine as one of the core pillars of their future strategy, and can shape it with solutions like vital signs monitoring, ultra-accurate temperature measurements, UVC or Bluetooth connected LTF tests amongst others.

Biography

Jens Milnikel can look back on more than 20 years' experience in the semiconductor industry. After several years at Roland Berger Strategy Consulting, he joined Infineon Technologies in 2001, holding several management positions.

With the photovoltaic industry on the rise, he moved to an international building material conglomerate. As managing director, Jens established and expanded the global solar business within this company.

In 2013 Jens joined Philips Lighting, where he shaped the system and service business as well as the transition from conventional to LED lighting.

Jens took on his current position as SVP at ams OSRAM in 2019, growing the Business Line Illumination.

Since May 2022 he has been managing the Business Unit ISS and is also part of the ams OSRAM corporate managing team.

Jens has a degree in Industrial Engineering from the Karlsruhe Technical University.

Foundry Solutions for Medical Semiconductor Sensors



U. Bretthauer
Product Marketing Manager Medical
X-FAB Silicon Foundries SE, Erfurt, Germany



Abstract

Modern medical devices rely on semiconductor technologies for reliable and accurate operation. The application of integrated sensors that record different physiological parameters is of paramount importance. These sensors usually require adaptation to the specific purpose. This presentation will introduce solutions for life-science applications based on CMOS sensor technologies and their targeted expansion to form microfluidic devices. Application specific adjustments must be made in cooperation with the end customer. The variety of medical applications that can be addressed with these semiconductor sensors is huge and the potential that these hold for future product development is exciting.

Biography

Dr. Ulrich Bretthauer has more than 30 years of experience in the design of analog/mixed-signal integrated circuits for various applications from automotive, industrial and communications.

After working on energy-efficient processor technologies in Intel's corporate research group. He joined X-FAB in 2015 as product marketing manager for the medical segment, where he oversees the application of X-FAB's processes in applications from personal medical devices and medical imaging to Lab-on-a-chip devices.

Medtech-Innovation through the Fusion of Microelectronics with Sensors



F. Laermer
Bosch Research Fellow - Senior Chief Expert
Robert Bosch GmbH, Corporate R&D, CR/EA CE-
MST, Renningen, Germany



Abstract

The „Vivalytic“ system from Bosch is an open platform for the automation of complex molecular diagnostics workflows. It can be used anywhere, at any “point-of-need”, by anybody without requiring extensive training. The combination of microelectronics, microsystems and microfluidics technologies yields a strongly miniaturized and fully automated system at a very reasonable cost. During the SARS-CoV-2 pandemic, rapid PCR-tests for the detection of COVID-19 could be integrated onto the platform and brought to market within a very short development time, early enough to fight the global pandemic and help restrict the spread of the disease. Supported by public funding from the BMBF (Acronym: “Vivalytic Light”, 16ME0174/5), new microelectronic solutions were developed for a more efficient “Vivalytic Light Analyzer” optimized for assays of lower complexity, as well as a new generation of “Vivalytic Light Cartridges”, and even faster PCR-workflows to discover SARS-CoV-2-and other infections. In particular, this is preparing for future pandemic outbreaks.

Beyond infectious disease cases, molecular diagnostics gives insight into the root-causes of many severe illnesses, including cancer. Guided by genetic profiling, targeted cancer therapies are moving away from a “one drug fits all” to a “the right drug for the individual patient” strategy. Liquid biopsies from cancer-patients’ blood-tests provide an ideal input probe to the “Vivalytic” platform, with novel microstructures performing upfront sample extraction and preparation from blood. In future, combined solutions like that will gain significance for the improvement of quality and outcome of cancer therapies.

Biography

Dr. Franz Laermer joined the Corporate Sector Research and Advance Engineering of Robert Bosch GmbH, Stuttgart, Germany, in 1990. He started the development of new key technologies and sensor functions for the upcoming field of Micro-Electro-Mechanical Systems (MEMS) at Bosch. His activities were mainly focused on new microstructuring, surface-micromachining and sacrificial layer etching technologies, as well as micro-accelerometers, gyroscopes and pressure sensors for the automotive area. Dr. Franz Laermer is the co-inventor of the "**Bosch Deep Reactive Ion Etching Process**" (“BOSCH-DRIE”) for microstructuring silicon. This key microstructuring technology revolutionized MEMS and is the root of all of today’s silicon-based MEMS. He holds more than 200 patents.

Since 2003, he is responsible for TOP-level innovation projects covering new MEMS application fields beyond automotive, including the biomedical area. Since 2009, he is Chief Expert for Microsystems, Microfluidics and Molecular Diagnostics. His newer work laid the foundation for the VIVALYTIC Molecular Diagnostics Platform of the newly founded Bosch Healthcare Solutions Business Division (BHCS GmbH). In 2018 he was established as the first **Research Fellow** at Bosch.

Dr. Franz Laermer was awarded with the prize “**European Inventor of the Year 2007 – Category Industry**” by the European Commission and the European Patent Office (together with co-inventor Andrea Urban), for the invention, development and sustainable success of the “BOSCH-DRIE”-process. In 2014 he received the “**2014 IEEE Jun-ichi Nishizawa Medal Award**” from the Institute of Electrical and Electronics Engineers (IEEE), USA, and in 2019 the “**Technology Prize of the Eduard-Rhein-Foundation**”, Germany.

Trends in and Challenges for the Microfluidic Industry



H. van Heeren
Boardmember
Microfluidics Association, Dordrecht, The
Netherlands



**Microfluidics
Association**

Abstract

There are many microfluidic applications and many different technologies being used. Most of the microfluidics start ups of the last 25 years have survived or have been acquired by large established companies. In that sense this is a very successful industry. The other side of the picture is that the road to success is long, and many survivors have not (yet) been able to grow substantially. The last two years we have seen an increased interest in microfluidics from governments, investors and established industries. This was driven by the urgent need for fast and accurate diagnostic instruments for COVID testing. Besides that, there are many other new applications of microfluidics that attracted attention, for instance 3D (bio)printing and Organ on chips. Beside these exiting developments there is growing awareness that the diversity mentioned above with its many opportunities has a darker side: lack of quality of production technologies, long time to market and difficulty to combine components from different suppliers.

The need for standardization of microfluidic connectors was long ago stated and different way forwards have been proposed. The Microfluidics Association (www.microfluidics-association.org, MFA) was founded to bring the microfluidics community together to work on microfluidic standards and guidelines. MFA founders have initiated the standardization working group ISO/TC48/WG3, set up to address standardization of microfluidic components, interfaces, protocols for associated testing and protocols for microflow control to be applied in the development and the fabrication processes (manufacturing, testing and assembly) of microfluidic devices. Recently the group published its first standard: *Microfluidic devices — Interoperability requirements for dimensions, connections and initial device classification*.

Interviewing the microfluidics experts from the supply chain, showed that besides microfluidic connectors, testing was also an issue. In more mature industries one can rely on well studied testing methods and technologies, which makes high yield production of reliable components and devices possible. Unfortunately, metrology for microfluidics fabrication has been neglected up till now. This was recognized by some metrology institutes. Supported by MFA members and based on the priorities defined by the MFA they initiated a project to develop test protocols for microfluidics that will facilitate communication for mutual understanding between customer and supplier and normalize testing practices between companies: MFMET (www.mfmet.eu). Qualified test protocols would not only be important for the user but also map process (in)stabilities for the manufacturer. This is essential for further quality improvement and yield increase. Success is only guaranteed when the community, industrial and academic contribute to this.

Biography

Henne van Heeren studied chemistry at the University of Utrecht and worked at the University Delft in the area of material science. At Philips Electronics he was responsible as operation manager for a magnetic head / MEMS waferfab. He followed his career as a business development manager at Philips and OnStream. After 17 years in the industry Henne started his own company in 2003 and initiated the enablingMNT group, now having offices in Germany, UK and the Netherlands. He assisted several high tech start-up companies and established companies on industrialization and commercialization issues. He lectured for the NATO on nanotechnology and published several articles and reviews about the development and industrialization of MEMS/MST products, including four guidelines for microfluidic design and manufacturing. Henne initiated discussions on microfluidic standardization, resulting in the foundation of the Microfluidics Association and an ISO microfluidic working group.

What's Next in the Digital X-Ray Medical Imaging Industry?



J. Mouly
Division Director
Yole Intelligence - part of Yole Group, Photonics & Sensing, Villeurbanne, France



Abstract

Market dynamics in digital X-ray imaging have been impacted by the Covid crisis, the current geopolitical context and new environmental policies. The Covid crisis upset demand in medical systems in 2020 and 2021. Healthcare facilities prioritized their budgets to fight Covid, boosting static radiography and computed tomography (CT). The medical business eventually returned to its pre-Covid dynamic and is expected to grow from \$1,780M in 2021 to \$2,128M in 2027 at the detector level. Computed tomography is progressively replacing classical radiography in medicine around the world thanks to improvement of performance linked to computational power during recent years. This presents specific opportunities in different geographical markets. For developed countries, the effort is focused more on technology with the emergence of photon-counting scanners, for example. New technologies will create new use-cases and open new segments. Another example is linked to development efforts on new types of detectors based on Indium Gallium Zinc Oxide (IGZO) material.

The presentation will describe the market forecast for the next five years and main technology trends observed in the field of X-Ray medical imaging detectors.

Biography

Jérôme Mouly is Director of the Photonics & Sensing Division at Yole Intelligence, part of Yole Group. Jérôme manages the expansion of the technical expertise and market know-how of the team. In addition, Jerome's mission focusses on the management of business relationships with company leaders and the development of market research and strategy consulting activities.

Jérôme Mouly earned a Master of Physics degree from the University of Lyon (FR).

How Integrated Circuits and AI turn Medical Devices Smart



F. Bozsak
CEO
Sensome, Massy, France



Abstract

Sensome, a clinical-stage start-up, has developed a revolutionary sensor technology that turns invasive medical devices into connected healthcare devices. The company's patented sensing technology combines the world's smallest impedance-based micro-sensors with machine learning algorithms to instantly identify biological tissues with unequalled predictive reliability. This sensing technology can be integrated into minimally invasive medical devices providing for a novel means of exploring, diagnosing and monitoring the human body. Our first product the Clotild® Smart Guidewire System is a connected neurovascular guidewire to categorize blood clots during the endovascular treatment of acute ischemic stroke. This product is currently undergoing clinical trials. Beyond stroke, this tissue sensing technology can be used in multiple other therapeutic areas, such as peripheral intervention and interventional oncology.

Biography

Franz obtained a M.S. in Aerospace Engineering from the University of Stuttgart and a Ph.D. from Ecole polytechnique in Biomedical Engineering on the optimization of stents. He is a graduate of the Stanford Ignite/Polytechnique business program. In 2014, he co-founded Sensome and has since brought together a team of renowned scientists, engineers and doctors to realize his vision of connected medical devices. He was named Innovator Under 35 by the MIT Technology Review in 2016.



D. Bouwes
Business Director
Micronit, Dortmund, Germany



Biography

Coming soon

Panelist



J. Dirven
Senior Business Development Manager Health
imec, Eindhoven, The Netherlands



Abstract

N/A

Biography

Joost Dirven obtained his MSc (Biotechnology - Bioprocess engineering) from Wageningen University & Research (WUR). Afterwards he held technical sales and business development positions at contract manufacturers in the macro- and micro-fluidics and developed a growing interest for MEMS and integration of components. He recently joined imec to strengthen the Business Development team focusing on Health applications.

Panelist



U. Weitzel
Direct. Strat Innov R&D
Merck Healthcare KGaA, Strategic Innovation
R&D, Darmstadt, Germany

Abstract

Coming Soon

Biography

Uwe Weitzel joined Merck in 2010. Since then, he held various Management positions, e.g., he was heading Global Finance & Controlling Healthcare R&D, Strategy & Operations at TIP Immuno-Oncology, Scientific Competitive Intelligence within Healthcare R&D before being appointed as Director Strategic Innovation R&D.

Prior to joining Merck, Uwe run his own business and held various positions with companies in international Finance and Controlling functions at Aventis Pharma and SAP AG. In addition, he worked at KPMG Consulting as a Senior Consultant mostly for chemical and pharmaceutical companies. Uwe studied organic chemistry and completed his PhD studies in biochemistry at the University of Freiburg. He holds a master's degree in Business Administration of the Technical University of Braunschweig and is a Certified Management Accountant.