# LETI DAY

OCTOBER 19, 2018
HSINCHU SCIENCE PARK, TAIWAN

CO-ORGANIZER:

semi

08:55 **Welcoming address,** Mr. Yann Gallais, CEA-Tech Representative in Asia

## INTRODUCTION SESSION

09:00 **Brain-inspired: from FDSOI to AI,** Dr. Emmanuel Sabonnadiere, CEO, CEA-Leti

09:20 **Keynote/ SEMI Market Outlook - Fab Investment, Equipment and Materials Forecast,** Mr. Clark Tseng, Director, Industry Research & Statistics, SEMI

## END OF MOORE'S LAW SESSION

09:40 **Keynote/ Maturity of the SOI Ecosystem,** Dr. Carlos Mazure, Chairman and Executive Director, SOI Industry Consortium

10:20 **Leti technology offer,** Dr. Laurent Clavelier, Head of Silicon Technology Division, CEA-Leti

10:00 **Leti lithography programs,** Dr. Laurent Pain, Business Development Manager, Silicon Technology Division, CEA-Leti

10:40-11:00 **COFFEE BREAK**

## WIRELESS COMMUNICATION AND IOT SESSION

11:00 **Update on Leti 5G antennas,** Dr. Lionel Rudant, Strategic Program Manager, Systems Division, CEA-Leti

11:20 **Wireless for IoT,** Mr. Eric Mercier, Head of Integrated Architectures and RF Laboratory, Architecture, IC Design and Embedded Software Division, CEA-Leti

11:45-12:00 **LETI-NARLABS MOU SIGNATURE CEREMONY**

12:05-13:15 **LUNCH BREAK**

## MORE THAN MOORE SESSION

13:15 **Intelligent devices at the edge,** Dr. Marc Duranton, CEA Fellow, Architecture, IC Design and Embedded Software Division, CEA-Leti

13:40 **Keynote/ Leverage MEMS Eco-systems in Taiwan via Micro Devices Laboratory (MDL) and micro Sensors and Actuators Tech. Consortium (uSAT),** Prof. Weileun Fang, PME Department, NEMS Institute, NTHU

14:10 **Update on Leti MEMS technology,** Dr. Philippe Robert, Head of MEMS and Packaging Section, Silicon Components Division, CEA-Leti

14:35-14:55 **COFFEE BREAK**

14:55 **Latest display technology developments,** Mrs. Sylvie Joly, Business Developer in Displays, Optics & Photonics Division, CEA-Leti

15:20 **Silicon photonics for telecom and beyond,** Mrs. Eleonore Hardy, Business Developer in Silicon Photonics, Optics & Photonics Division, CEA-Leti

15:45 **Leti-Taiwan cooperation through EU programs,** Dr. Laurent Herault, VP Europe, Head Office, CEA-Leti

15:55 **Closing remarks,** Dr. Emmanuel Sabonnadiere, CEO, CEA-Leti

16:00-17:00 **NETWORKING**

# SPEAKERS BIOS

## Dr. Emmanuel Sabonnadiere

**CEO, CEA-Leti**

Since November 20th, 2017, Emmanuel Sabonnadiere is the CEO of the Leti. Before, he was Director of the Industrial Partnerships Division of CEA Tech.
Previously, Emmanuel Sabonnadiere was CEO of the Business Group Professional of Philips Lighting based in Amsterdam (NL). From 2008 till 2014, he was CEO & Chairman of General Cable Europe based in Barcelona (Spain). Emmanuel Sabonnadiere was CEO of NKM Noell at Wurzburg (Germany) from 2005 till 2008. He was vice-president of the Distribution Transformers division of Alstom T&D for 5 years. He began his career in 1992 at Schneider Electric holding various positions including that of Managing Director of development for equipment units. Emmanuel Sabonnadiere has a strong technological background combined with a successful business track record over decades. With 25+ years of executive leadership of large operations, he had produced successful operating result and great Team building. He has gained a sound experience of change management in large multi-cultural matrix organizations in order to adapt to the new markets conditions and a strong knowledge of European and International environments. He designed and set-up Strategic Plans including innovation process. Emmanuel Sabonnadiere believes in operational excellence, innovations in technology, talents management and enthusiasm in leadership.
Emmanuel Sabonnadiere obtained a PhD in physics (France), and an engineering degree in Information Technology (France). He holds a MBA (France).
Emmanuel Sabonnadiere is a fully qualified instructor at the ski school in Les Ménuires, and member of the Advisory board of IAC.

## Mr. Clark Tseng

**Director, Industry Research & Statistics, SEMI**

Clark Tseng, Director of Industry Research and Statistics at SEMI, is responsible for developing and executing the global strategy for SEMI industry research and statistics products and services. His major responsibility is to track and analyze semiconductor manufacturing supply-chain dynamics worldwide with the emphasis in Asia-Pacific and China. His research also spans over adjacent microelectronics industries including Foundry, Memory, OSAT, MEMS and Automotive semiconductor. His expertise includes in-depth analysis of the industry dynamics, as well as the fundamentals of market forecasting, competitive analysis, and strategic planning. Also, Clark is responsible for managing market statistics partnerships globally.
Before SEMI, Clark worked for Qimonda as the manager at the Strategy and Business Development division, where he managed market & competitive intelligence function in Asia/Pacific.
Clark Tseng received a Bachelor of Business Administration and a Bachelor of Arts in International Relations from National Chengchi University in Taiwan.

## Dr. Carlos Mazure

**Chairman and Executive Director, SOI Industry Consortium**

CTO & EVP, Head of Corporate R&D at Soitec since 2001. Chairman and Executive Director of SOI Industry Consortium since July 2014.
IEEE Fellow, 30 years of experience in Semiconductor Industry. Prior to Soitec, Carlos headed the ferroelectric FeRAM program at Infineon (Munich, Germany), and initiated Infineon/Toshiba FeRAM Alliance. Earlier he worked for IBM/Infineon DRAM Alliance (Fishkill, NY), and before at APRDL, Motorola (Austin, Texas).

## Dr. Laurent Clavelier

**Head of Silicon Technologies Division, CEA-Leti**

Laurent CLAVELIER joined CEA-LETI (LETI / Electronic business unit of CEA TECH) as a research engineer in 1998. He has been successively involved as researcher on Fully Depleted SOI program with Texas Instruments (Jack Kilby Fab in Dallas) and as a project leader on Power Devices and Hetero-junction Bipolar Transistors programs with STMicroelectronics. Between 2004 and 2007, he was in charge of the "nanoelectronics devices on Germanium On insulator" team and he launched the "cool cube ®" idea. Between June 2007 and August 2010 he managed the thin films and circuits transfer laboratory of CEA-LETI. He and his team are developing innovative substrates in close collaboration with SOITEC but also 3D technologies involving molecular bonding.
In 2010, he moved to CEA-LITEN (the Renewable business unit of CEA TECH) and was in charge to develop the Solar Division in Chambery (60M€ / 350 people) in order to double the size of the institute in 4 years with competitive funding (essentially industrial bilateral programs). He succeed and in 2014, he was asked to lead the Material Division of CEA-LITEN in Grenoble (powder metallurgy, nanomaterials, printed electronics, 3D printing, ...).
From 2015 to the end of 2018, he was Director for Industrial Partnerships of CEA TECH. His team is in charge of more than 50 bilateral industrial partnerships with large industrial and service companies such as : RENAULT-NISSAN, SAFRAN, AIRBUS, ALSTOM, VEOLIA, SCHNEIDER, VALEO, SNCF, VINCI, PANASONIC, ...etc.
Since January 2018, he is the director of the semiconductor platform of CEA-LETI. This platform is one of the largest in Europe (more than 400 tools, 9000 m² and more than 500 people working on it) and one of the most advanced microelectronic clean room (200mm and 300mm) dedicated to Research, Development and Innovation.
Laurent CLAVELIER received an engineer degree and a Master diploma in electrical engineering from the Polytechnics Institute of Grenoble in 1997, he is author or co-author of more than 150 papers published in conferences and journals and he owns 37 patents.

## Dr. Laurent Pain

**Business Development Manager, Silicon Technologies Division, CEA-Leti**

Laurent Pain graduated from the Ecole Nationale Supérieure de Physique de Grenoble in 1992. After receiving a PhD in 1996, he joined the Optronic Division of CEA-LETI. In 2000, he moved to STMicroelectronics Crolles site to participate to the start of the first 193nm litho cell. From 2001 to 2008, he leaded the E-Beam direct write litho cell in the ST Crolles manufacturing site. Back to Leti in 2008, he leaded the Lithography Laboratory of the Silicon Technology Division of CEA-LETI back pushing the insertion of innovative lithography techniques : multibeam, DSA and imprint. Since July 2014, he manages the Patterning Programs and ensures all the associated business and partnerships development (bilateral industrial and institutional collaborations).

## Dr. Lionel Rudant

**Strategic Program Manager, Systems Division, CEA-Leti**

Lionel Rudant is currently Strategic Marketing Manager at Leti. He draws up innovation strategies for conquering IoT markets through key enabling technologies that unleash innovative business. He has successfully transferred Leti wireless technologies to automotive, aeronautics, and industrial and consumer electronics industries, among others. He works on projects in France, Europe and the USA, and regularly presents technologies and system roadmaps at conferences and workshops.
He was awarded a postgraduate degree in electronics and digital technology by Nantes University (France) and a technology research degree by Grenoble Institute of Technology in 2003 and 2004 respectively. He then managed industrial antenna projects for Radiall. He joined Leti in 2006 and has since undertaken electromagnetics, antenna and propagation research, prompting publications on compact disruptive antennas.

## Dr. Eric Mercier

**Head of Integrated Architectures and RF Laboratory, Architecture, IC Design and Embedded Software Division, CEA-Leti**

Eric Mercier graduated from the ENSEEIH of Toulouse, France, 1991, and holds a DEA in Microwaves focused on Near-field/Far-field antenna diagram conversion done at Thales-Alenia Space (formerly Alcatel Space).
After having held positions in the Optical Test Equipment with Schlumberger/Wavetek, for physical fiber optical link tests, as Analog & Signal Processing engineer, he has pursued his work in the semiconductor domain, back to RF topics in companies like ST and Atmel as R&D Application & Characterization engineer, as well as Marketing engineer. His main field of interest has been low-power RF dedicated to IoT. His is now at CEA-Leti since 2006, where he has led projects in the scope of ULP RF, with a specific focus on low-power RF transceiver design & implementation, and on embedded resources dedicated to low-power IoT solutions. Among these research, the FOXY solution has been awarded ''Electron D'Or – Golden Electron 2018'' for ''Connected Objects''. He is now the Head of the Laboratory for Architectures & Integrated RF design (LAIR) in the Architecture, IC Design and Embedded Software department. This Lab. is in charge of designing RF solutions for ULP, UWB, UNB, mmW, High-Data Rate, RFID, PA & FEM systems, with a common target of addressing the lowest possible power consumption and make use of the most advanced CMOS technologies. He has co-authored some conference papers and participated to a book chapter on Wireless Sensor Network topic.

## Dr. Marc Duranton

**CEA Fellow, Architecture, IC Design and Embedded Software Division, CEA-Tech**

Dr. Marc Duranton is a member of the Research and Technology Department of CEA (French Atomic Energy Commission). He previously spent more than 23 years in Philips and Philips Semiconductors where he worked on several video coprocessors for the VLIW processor TriMedia and for various Nexperia platforms. In NXP Semiconductors, he led the Ne-XVP project that targeted the design of the hardware and software of a multi-core processor for real-time applications and for consumer video processing. He also led the architecture of the family of L-Neuro chips, digital processors using artificial neural networks techniques.
His current interests include Neural-Networks, Deep Learning and cognitive systems, parallel architectures for high performance and real-time processing, compiler technology and emerging paradigms for computing systems. He has published more than 35 patents and several book chapters. He is in charge of the roadmap activity of HiPEAC on High Performance and Embedded Architecture and Compilation, freely available at http://www.hipeac.net/roadmap. He was the co-organizer of the «France-Japan Symposium on Deep Learning and Artificial Intelligence» which was held in The University of Tokyo on October 12th, 2016.

## Prof. Weileun Fang

**PME Department, NEMS Institute, NTHU**

Prof. Fang has been working in the MEMS field for more than 20 years. He received his Ph.D. degree from Carnegie Mellon University (Pittsburgh, PA) in 1995. His doctoral research focused on the determining of the mechanical properties of thin films using MEMS structures. He joined the Power Mechanical Engineering Department at the National Tsing Hua University (Taiwan) in 1996, where he is now a Chair Professor as well as a faculty of NEMS Institute. From June to September 1999, he was at California Inst. of Tech. as a visiting associate. He became the IEEE Fellow in 2015 to recognize his contribution in MEMS area.
Prof. Fang has published more than 150 SCI journal papers, 250 international conference papers, and 80 patents (all in MEMS field). He is now the Chief Editor of JMM (SCI journal by IoP), the Board Member of IEEE Trans on Device and Materials Reliability, and Sensors and Materials, and the Associate Editor of IEEE Sensors J., and Sensors and Actuators A. He served as the Chief Delegate of Taiwan for the World Micromachine Summit (MMS) in 2008-2012, and the General Chair for MMS 2012. He also served as the TPC (Tech. program committee) of IEEE MEMS'04, '07, and '10, the TPC of Transducers'07, and the ETPC (Executive TPC) of Transducers'09-'15. He has become the member of ISC (International steering committee) of Transducers from 2009, and was the General Chair of Transducers'17. He serves as the Asia Regional Program Chair of IEEE Sensors'10, and the TPC Chair of IEEE Sensors'12.
There are near 50 PhD and 70 Master students graduated from Prof. Fang's group so far. Most of them are working in the MEMS and micro sensors related companies, such as TSMC, UMC, ASE, apm, Apple, ADI, TDK-InvenSense, GMEMS, Richtek, Delta, PixArt, mCube, etc. He is now the VP of MEMS Committee of SEMI Taiwan. He is the Standing Committee Member of the Nanotechnology and Micro System Association (NMA), Taiwan. He also served as the Chairman of NMA from 2013-2014. Moreover, Prof. Fang also serves as the Technical Consultant for many MEMS companies in Taiwan.

## Dr. Philippe Robert

**Head of MEMS and Packaging Section, Silicon Components Division, CEA-Leti**

Philippe Robert is Head of the Microsystems Section at CEA-Leti dealing with MEMS sensors and actuators, RF-MEMS, passive components, 3D integration and packaging.
He received a M.Sc. degree in optical electronics in 1991 and a Ph.D in electrical engineering in 1996 from Grenoble-INP, France. After various positions in the sensors industry, he joined the CEA-Leti in 2001 as project manager on RF-MEMS, and then as Manager of the MEMS Sensors Group from 2004 to 2013.
He has authored or co-authored about 40 journal papers and conference contributions, and holds more than 60 patents dealing with MEMS and NEMS. He was member of the IEEE-MEMS Technical Committee in 2007 and 2008 and of the International MEMS Industry Forum Committee at SEMI Europe 2014. Currently, he is member of the International Steering Committee of TRANSDUCERS conference, of the EUROSENSORS conference and of the European MEMS Summit.

## Mrs. Sylvie Joly

**Business Developer in Displays, Optics & Photonics Division, CEA-Leti**

Sylvie Joly is display business developer at CEA-LETI. Sylvie received M.Sc. in Microelectronics from ISEP «Institut Supérieur d'Electronique de Paris» in 1989. She completed her education with a Master in Marketing and Innovation at the Grenoble Ecole de Management (GEM) in 2001. As a Sr. Marketing Engineer in the CEA's Technology Transfer Department, she built a strong experience in setting up and managing marketing surveys. Before joining CEA, she spent 10 years in the industry as an R&D engineer, and 8 years as Sales engineer in several companies including Hewlett Packard and Ericsson.

## Mrs. Eléonore Hardy

**Business Developer in Silicon Photonics, Optics & Photonics Division, CEA-Leti**

Eleonore Hardy joined CEA-Leti in 2018 as a business developer in silicon photonics. She holds a Master's degree in Engineering and followed a MS in Management & Innovation. Eleonore has been working in the optics and photonics industry since 2005 and previously worked for Philips in the Netherlands and for Varioptic (a BU of Corning) in China. During her career, Eleonore has been successful in creating long-term value in lasers in France, China and India for Quantel (Lumibird), and spectrometers in Europe and Asia for Resolution Spectra Systems. Eleonore is dedicated to developing new business opportunities in silicon photonics, especially in communications, sensing and high-performance computing.

## Dr. Laurent Herault

**VP Europe, Head Office, CEA-Leti**

Dr. Laurent Hérault was born in Tours, France, in 1964. He received the BS degree in electrical engineering and the MS degree in control engineering from the Institute National Polytechnique de Grenoble, (INPG) in 1987 and a Ph.D. degree in computer science from INPG in 1991. He won the Best Junior Researcher Award from the University of Grenoble, France, in 1990. Since 2004 he is 'International Expert' at CEA. From 2009 to 2011, he has led the Wireless Communications and Security labs.
Since 2011 he is VP, Director of the Europe division of CEA-Leti.