



MUNDFAB

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ICT Project No 871813

MUNDFAB

Modeling Unconventional Nanoscaled
Device FABrication

D7.5: Symposium at the E-MRS Spring Meeting

Fuccio Cristiano (CNRS), Alessandra Alberti
(CNR), Peter Pichler (Fraunhofer)

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Quality management

This deliverable was reviewed by:

Antonino La Magna (CNR)

Chiara Rossi (Fraunhofer)

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Abstract

To enable an intensive exchange of information as well as for a widest-possible dissemination of the MUNDFAB project results, a symposium on “Materials engineering for advanced semiconductor devices”¹ (symposium M in the alphabetic list) was organized at the Spring Meeting 2023 of the European Materials Research Society (E-MRS) from May 29 to June 2, 2023, in Strasbourg, France.

1 Timing of the symposium

Originally, the symposium was planned for Spring 2022. However, in November 2020 it became clear that there was no call for symposia for the E-MRS Spring Meeting 2022. This was, because of the COVID-19 pandemic, the already defined E-MRS Spring Meeting 2021 was postponed to 2022. This left us the choice between applying for a symposium at the E-MRS Fall Meeting 2022 or the E-MRS Spring Meeting 2023. At the beginning of 2021, a symposium at the E-MRS Spring Meeting 2023 would have been five months after the formal end of MUNDFAB. However, it was already foreseeable that MUNDFAB would need to apply for an extension and there were good reasons for not applying for a symposium at the E-MRS Fall Meeting 2022: On the one hand side, topics like those of MUNDFAB have always (or traditionally) been included rather in the Spring Meetings and on the other hand also because in Fall there are several other conferences of importance in our area (ESSDERC, SISPAD, GADEST, ECSCRM and ICSCRM) which might reduce the number of potential participants. A further motivation was that the 2023 E-MRS Spring Meeting was the first one expected to be held again in person. After consultation with Prof. Peter Wellmann, at that time president of E-MRS, and Prof. Juan Ramón Morante, one of the chairs of the E-MRS Spring Meeting 2022, we have decided to apply for a symposium at the Spring Meeting 2023, even at the risk of having no other opportunity if this proposal is rejected.

Finally, after the call for symposia was published in July 2021, the proposal for our symposium was submitted by January 2022 and accepted on May 13, 2022.

2 Symposium details

To attract a broad community, “Materials engineering for advanced semiconductor devices” was chosen as title for the symposium and besides the MUNDFAB members F. Cristiano, A. Alberti and P. Pichler, Benjamin Colombeau of our Privileged Partner Applied Materials and Prof. Lourdes Pelaz of the Universidad de Valladolid were asked to act as symposium organizers.

During the symposium, the symposium assistants Chiara Rossi (Fraunhofer) from the MUNDFAB team and Mohamed Abdelrahman (CEA-Leti) provided important help in running the symposium.

¹ <https://www.european-mrs.com/materials-engineering-advanced-semiconductor-devices-emrs>

2.1 Scientific Committee

To assist the organizers particularly with respect to the formulation of the topics of the symposium but also the selection of invited speakers and the selection of abstracts, a Scientific Committee was established comprising highly respected researchers in the field:

- Giuseppe Arena, STMicroelectronics Catania (Italy)
- Matthias Bauer, Mattson Technology (USA)
- Medhi Bazizi, Applied Materials (USA)
- Ray Duffy, Tyndall Research Institute Cork (Ireland)
- Jonathan England, University of Surrey, Guildford (UK)
- Anne Hemeryck, CNRS-LAAS Toulouse (France)
- Yu-Long Jiang, Fudan University Shanghai (China)
- Paweł Piotr Michałowski, Ł-IMIF Warsaw (Poland)
- Enrico Napolitani, University of Padova (Italy)
- Benoit Sklenard, CEA-LETI Grenoble (France)
- Dimitris Tsoukalas, NTUA Athens (Greece)
- Marilena Vivona, CNR-IMM Catania (Italy)

of which Anne Hemeryck, Paweł Piotr Michałowski, Enrico Napolitani, and Benoît Sklénard are members of the MUNDFAB team.

2.2 Topics

Following and extending the scope of MUNDFAB, contributions were asked for in the following fields:

- Substrate Fabrication: epitaxial growth of semiconductor materials and related compounds (Si, Ge, SiGe, SOI, SiC, GaN, ...); strained and unstrained layers; compliant substrates for heteroepitaxial growth, selective growth on patterned substrates
- Nanostructured and new materials for future devices: 2D channel materials, nanowires, nanosheets, dielectrics, materials for quantum technology
- Dopant and contact engineering: in-situ and advanced implant doping methods, silicide and germanide formation, multilevel metallization schemes (pre-cleaning, early stages of phase nucleation, interdiffusion, strain...)
- Selective and low thermal budget processes: selective dielectric deposition, localised epitaxy and etching, ultra-fast (Flash and Laser) annealing methods, radical-based surface treatments
- Surfaces and interfaces: surface passivation, structural and electrical properties of channel/dielectric and junction/metal interfaces, thin film and high-k dielectric materials...
- Metrology and characterization: new advances in the structural and electrical characterization of semiconductor materials and related compounds (nanoscale characterization, 3D, ...)
- Integration issues: 3D monolithic and heterogeneous integration, layer transfer
- Applications in advanced devices: nanoelectronic devices (FinFETs, FD-SOI, GAA-FETs, cryogenic MOS), high-bandgap power transistors (SiC MOSFETs and diodes, GaN HEMTs ...)

- Modeling and Simulations of the above listed materials' properties and processes (from ab-initio to continuum TCAD)

2.3 Invited presentations

To stimulate the submission of abstracts, and to give the symposium a certain structure, experts in the respective fields were invited to give presentations about the respective state-of-the-art:

- Laurent Brunet, CEA-Leti, Université Grenoble Alpes, France: Recent advances in 3D sequential integration
- Nadine Collaert, IMEC, Belgium: Enabling High-capacity 6G Wireless Communication: Harnessing the Potential of InP Semiconductors
- Pierre Eyben, IMEC, Belgium: Combining cutting-edge metrology techniques and TCAD to support device integration towards the 2nm Technological Node and Beyond
- Magali Gregoire, STMicroelectronics, France: Optimization of the contact engineering processes in the frame of advanced semiconductor devices development
- Antonino La Magna, CNR-IMM, Italy: Multiscale simulations of critical processes for the fabrication and functionalization of nanostructures
- Miguel A. L. Marques, Institut für Physik, Martin-Luther-Universität Halle-Wittenberg, Germany: Machine-learning-assisted determination of the global zero-temperature phase diagram of materials
- Dominique Mangelinck, IM2NP-CNRS-AMU, France: Some challenges and issues for contacts formation and stability in microelectronics
- Victor Moroz, Synopsys, USA: Material Engineering for Advanced CMOS Technology
- Michael Nolan, Tyndall National Institute, Ireland: Modelling of Interfaces and Surface reactions
- Daniele Pagano, STMicroelectronics, Italy: Virtualization of processes, metrology and maintenance for advanced SiC-based device manufacturing
- Ionut Radu, Soitec, France: New Substrate Materials for Advanced Electronic Devices
- Kentarou Sawano, Tokyo City University, Japan: Strain engineering of Si/Ge heterostructures based on Ge virtual substrates
- Werner Schustereder, Infineon Technologies Austria AG, Austria: Advanced Processes for Power Devices
- Shashank Sharma, Applied Materials, USA: Novel Processes for Advanced Nanoelectronics Devices
- André Vantomme, KU Leuven, Belgium: Tuning nickel silicide properties via ion implantation: the role of defects and impurities

2.4 Sponsors

Based on the attractive topics and with the help of many MUNDFAB team members, the following sponsors could be acquired:



The European Nanoelectronics Access Network



ASM International



LAAS/CNRS featuring also MUNDFAB



LASSE Laser System & Solutions of Europe



Mattson Technology



life.augmented

STMicroelectronics



Synopsys

3 Calls for abstracts, abstract submissions and program

After collecting a list of email addresses of potential contributors, calls for abstracts were sent out on November 8, 2022, December 5, 2022, and January 5, 2023.

In response to the calls, the symposium received nearly 250 abstracts, which is roughly **twice** the number of abstracts we got for symposia at E-MRS Spring Meetings in the past but also which one typically gets for a conference like SISPAD, GADEST, or even ESSDERC. In order to select the abstracts within a relatively short time, not only the Scientific Committee but also the invited speakers were asked and helped in assessing the abstracts. The graph in Figure 1

shows the number of abstracts which have obtained a higher score than the value on the abscissa.

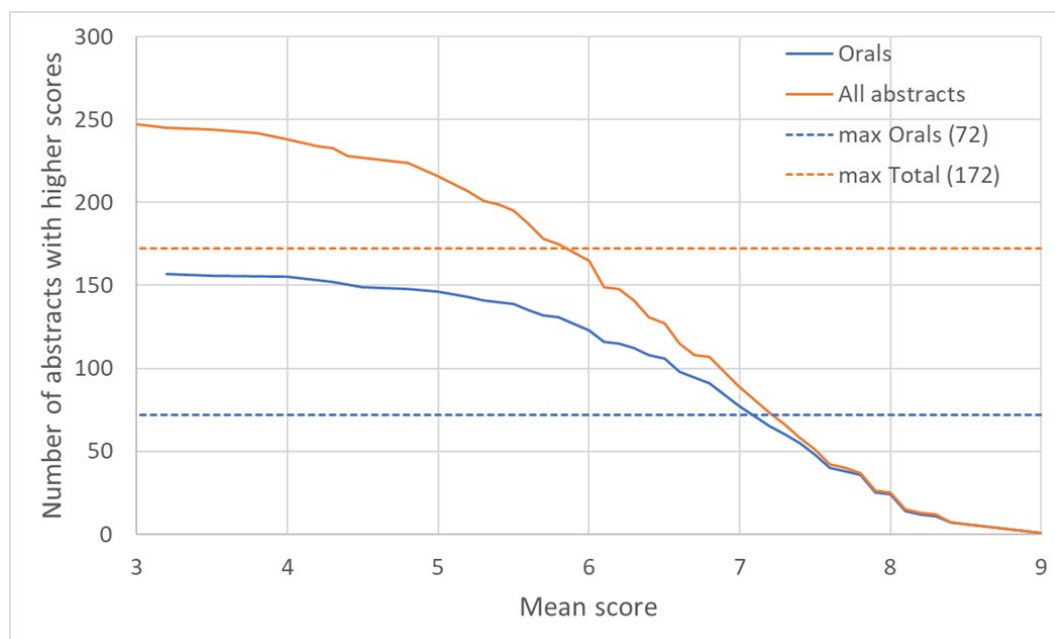


Figure 1: Abstracts with score higher than value on x-axis.

Within the limitations of the E-MRS Spring Meeting with its program from Monday morning to Friday noon, 72 contributed oral presentations and two poster sessions with 50 posters each could be accepted. The full program with the contributions from MUNDFAB members highlighted can be found by the end of the deliverable.

4 Awards

The symposium could nominate two Young Researcher Awards. The committee responsible for the selection among twelve candidates consisted of

- Jonathan England, University of Surrey, Guildford (UK)
- Peter Pichler, Fraunhofer IISB, Erlangen (Germany)
- Ionut Radu, Soitec (France)
- Werner Schustereder, Infineon Technologies Austria AG (Austria)

and dedicated the awards to

- Julien Bassaler, Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, Grenoble (France) for his contribution "Investigation of electron mobility in AlGaN channel heterostructures with different Al content"
- Tadeáš Hanuš, Institut Interdisciplinaire D'innovation Technologique, Université de Sherbrooke and Laboratoire Nanotechnologies Nanosystèmes (IN2) – CNRS Irl-3463, Sherbrooke (Canada) for his contribution "Growth of transferable germanium membranes on porous substrate for flexible optoelectronics"

In addition, to encourage presenters of posters, we award four prizes for the best posters (two per session). Considering that 50 posters had to be assessed in less than two hours, two committees were established. The committee consisting of

- Enrico Napolitani, University of Padova (Italy)
- Pier Francesco Fazzini, INSA Toulouse (France)
- Antonino La Magna, CNR-IMM (Italy)

awarded the Best Poster prizes for the Tuesday poster session to

- Abdulgaffar Abdurrazaq, LAAS-CNRS, Toulouse (France) for the MUNDFAB-related contribution “Density functional theory study of multiinterstitial defects complexes in germanium”
- Ana Pérez Rodríguez, Nanotechnology Group, Department of Physics, University of Salamanca, Salamanca (Spain) for her contribution “Effect of gallium doping on structural and transport properties of the topological insulator Bi₂Se₃ by molecular beam epitaxy”

and the committee consisting of

- Alessandra Alberti, CNR-IMM, Catania (Italy)
- Pierre Eyben, IMEC (Belgium)
- Anne Hemeryck, CNRS-LAAS Toulouse (France)

awarded the Best Poster prizes for the Thursday poster session to

- Asmita Thool, Indian Institute of Technology, Madras - Chennai (India) for her contribution “Synthesis of Large-Area Monolayer MoS₂ for Two-Terminal Neuromorphic Devices with Short-Term Memory”
- Yunchae Jeon, Yonsei University, Seoul (Korea) for her contribution “Gate/light co-tunable negative differential resistance behaviors and 9 by 9 photodetectors array from small-molecules heterostructure”

5 Special issue with selected symposium contributions

To further advertise the symposium, authors of accepted abstracts were invited to contribute to a special issue on “Materials engineering for advanced semiconductor devices” in Materials Science in Semiconductor Processing with Alessandra Alberti as chief guest editor.

Following a survey, some thirty contributions can be expected for the deadline of June 30, 2023.

Conclusions

Because of the attractive scope, the symposium found an overwhelming echo in the community and offered an outstanding forum for the dissemination of MUNDFAB results but also for a plethora of discussions among colleagues who could meet again after the end of the COVID-19 pandemic.



European Materials Research Society

2023 Spring Meeting May 29 | June 2

40th Anniversary

Congress & Exhibition Centre, Strasbourg, France

SYMPOSIUM M

Materials engineering for advanced semiconductor devices

Symposium Organizers:

Fuccio CRISTIANO, LAAS-CNRS, Toulouse, France

Alessandra ALBERTI, CNR-IMM, Catania, Italy

Benjamin COLOMBEAU, Applied Materials, Sunnyvale, USA

Lourdes PELAZ, Universidade de Valladolid, Spain

Peter PICHLER, Fraunhofer IISB, Erlangen, Germany

Published in Materials Science in Semiconductor Processing by Elsevier

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Monday May 29

M01

Integration Challenges

Chairperson(s) : PICHLER Peter

Schuman (1st floor)

08:45	2740	INV	Recent advances in 3D sequential integration	BRUNET Laurent
09:15	958		Reconfigurable Field-Effect Transistor Technology via Heterogeneous Integration of SiGe with Crystalline Al Contacts	WIND Lukas
09:30	1411		Engineering of HZO layer for the fabrication of ultimate 3D vertical transistors for Memory-in-Logic applications	MOUSTAKAS Konstantinos
09:45	817		Isotopically Enriched ²⁸ Si Substrates for Quantum Computers Produced Using Ion Implantation Layer Exchange	ENGLAND Jonathan

Monday May 29

M02

Simulation and Modeling I

Chairperson(s) : MARQUES Miguel A. L.

Schuman (1st floor)

10:30	1974	INV	Modelling of Interfaces and Surface reactions	NOLAN Michael
11:00	1417		First Principles Calculation of Alloy Scattering Parameters and their Effect on the Mobility of GeSn	SEWELL Kevin
11:15	1551		Metal-Dielectric Adhesion Improvement Using Germanium Incorporation	BAZIZI El Mehdi
11:30	1830		Electronic properties of interstitial atom clusters in silicon and their impact on devices	JAY Antoine
11:45	2168		Variability in Si Spin Qubits Due to Disordered Si/SiO ₂ Interfaces	CVITKOVICH Lukas

Monday May 29

M03

Substrate Technologies and Layer Synthesis I

Chairperson(s) : SAWANO Kentarou

Schuman (1st floor)

13:30	188	INV	New Substrate Materials for Advanced Electronic Devices	RADU Ionut
14:00	198		Low temperature epitaxial SiGe:P for gate-all-around(GAA) nMOS devices	FUJIMOTO Yuta
14:15	622		Deposition of Zr _{0.05} Sn _{0.95} O ₂ Thin Film using Mist Chemical Vapor Deposition and Its Application to Thin-Film Transistor	HSU Meng-Yu
14:30	1129		CVD-Growth of Tellurium-Based 2D Materials	GHOMI Sara
14:45	360		Direct growth of wafer-scale self-separated GaN on reusable two-dimensional material substrate	HUANG Chang-Hsun

Monday May 29

M04

Metrology and Characterization I

Chairperson(s) : EYBEN Pierre

Schuman (1st floor)

15:00	512		Raman spectroscopy in Ge and GeSn: Temperature dependence	SPIRITO Davide
15:15	1779		Polarized Raman scattering of epitaxially grown GeSn layers with different Sn contents	CORLEY-WICIAK Agnieszka Anna
15:30	526		Coupling X-ray Beam Induced Current and X-ray Diffraction Imaging to characterize diamond plates used as semiconductor-based detectors	LAFONT Fabien
15:45	1522		X-ray Nanobeam Mapping of Lattice Strain Modulations from CMOS-Processed TiN Gate Electrodes for Quantum Technologies	CORLEY-WICIAK Cedric

Monday May 29

M05

Advanced Doping Technologies

Chairperson(s) : BAUER Matthias

Schuman (1st floor)

16:30	2509	INV	Novel Processes for Advanced Nanoelectronics Devices	SHARMA Shashank
17:00	638		Title of abstract: Study on the electrical properties of ultrathin in situ Boron-doped strained Si _{0.7} Ge _{0.3} layers annealed by nanosecond pulsed laser	DAUBRIAC Richard
17:15	1027		Study on structural and electrical properties of Si:P and Si:As films treated by RTA and NLA	LEE Kihyen
17:30	1171		Sb heavy doping of Ge _{1-x} Sn _x epilayers by Pulsed Laser Melting	FONTANA Daris
17:45	1308		Evolution of carrier mobility and carrier density of femtosecond laser sulfur hyperdoped silicon after different post-processing treatments	PAULUS Simon
18:00	1808		Impact of Nanosecond Laser Annealing on the Structural and Electrical Properties of Heavily in-situ B-doped SiGe Epitaxial Films	JO Chunghee
18:15	926		Phosphorus monolayers formation on Ge: towards a reliable monolayer doping	SGARBOSSA Francesco

Tuesday May 30

M06

Simulation and Modeling II

Chairperson(s) : NOLAN Michael

Schuman (1st floor)

10:00	2737	INV	Machine-learning-assisted determination of the global zero-temperature phase diagram of materials	MARQUES Miguel A. L.
10:30	1196		Ground and excited state properties of meta-stable allotropic forms of 2D Tellurium from first principles approaches	GRILLO Simone
10:45	574		Charged intrinsic defect states in amorphous Si ₃ N ₄	WILHELMER Christoph
11:00	710		Multiscale modeling of ultrafast transformations and structural disorder in laser annealed SiGe nanostructures	CALOGERO Gaetano
11:15	858		Functionality of polycrystalline-Si channel: insight from first-principles and multi-scale modeling	MAJI Rita
11:30	1769		A Multiscale Modeling Approach for Revealing Defects Relevant in Charge Trapping Related Phenomena	WALDHOER Dominic
11:45	2065		Kinetic Monte Carlo simulations of heated boron implantation and non-melt laser annealing in Si and SiGe layers	MUNDINAR Simon

Tuesday May 30

M07

Power Devices I

Chairperson(s) : SCHUSTEREDER Werner

Schuman (1st floor)

13:30	1508	INV	Virtualization of processes, metrology and maintenance for advanced SiC-based device manufacturing	PAGANO Daniele
14:00	1538		Growth of thick GaN layers on Si (111) for vertical power devices	MICHLER Sondre
14:15	681		Investigation of electron mobility in AlGaIn channel heterostructures with different Al content	BASSALER Julien

14:30	1292	Novel Energy-Filtered Field Stop Technology for IGBT Power Devices	KOCH Robert
14:45	932	Single step of μ s UV laser annealing for Si IGBT back-side activation	CHEHADI Zeinab

Tuesday May 30

M08

Silicides and Germanides I

Chairperson(s) : MANGELINCK Dominique

Schuman (1st floor)

15:00	227	INV	Optimization of the contact engineering processes in the frame of advanced semiconductor devices development.	GREGOIRE Magali
15:30	524		Effects of roughness variation on the electrical and structural properties of Ni silicide ohmic contacts formed by UV laser annealing	BADALÀ Paolo
15:45	2131		Investigation of the formation of nickel silicides on vertical silicon nanostructured channel for advanced electronics	MÜLLER Jonas

Tuesday May 30

M_P01

Poster session 1

Etoile (1st floor) - 4.30 p.m to 6.30 p.m

01_40	Defects visualization in Gallium Nitride by Scanning Transmission Electron Microscopy	BONGIORNO Corrado
02_148	Investigation of carrier Lifetime variation with nanopillar spacing in Si-nanopillar/SiGe composite materials for MOSFET application by laser heterodyne photothermal displacement measurements	HARADA Tomoki
03_300	Deep Level Transient Spectroscopy-Secondary Ion Mass Spectrometry combined study of H ⁺ irradiation effects on 4H-SiC	SCALISI Melissa Lucia
05_778	Super-Resolution Fluorescence Imaging for Semiconductor Nanoscale Metrology and Inspection	MUN Seohyun

06_811	Band Bending and Surface Composition Analysis by Angle Resolved XPS and Their Impact on Minority Carrier Lifetime After Germanium Wet Etching	CHAPOTOT Alexandre
07_930	Manipulating spin texture in a hybrid nanostructure comprised of topological insulator and 2D semiconductor with varied band alignment types	CHENG Cheng-Maw
08_950	Thermal transport on few-layers Fe ₃ GeTe ₂	CLARO Marcel S.
09_1102	Stress/strain-induced Raman frequency shift in Gallium Nitride (GaN) Packaged Devices	DAHROUCH Zainab
10_1471	Features of Ultrathin SiO ₂ Layers on Si and Their Physical Manifestations	KONIN Konstantin
11_1472	4H-SiC RIE etch: Design of Experiments optimization for striations recovery by using ImageJ software	BARCELLONA Matteo
12_2639	Sub-Picosecond Carrier Dynamics Explored using Automated High-Throughput Studies of Doping Inhomogeneity within a Bayesian Framework	AL-ABRI Ruqaiya
13_355	Radiation-enhanced annealing of vacancy-oxygen defects in Cz n-Si: features of the experiment, factor of the radiation ionization, and a possible annealing mechanism	KRAS'KO Mykola
14_518	New states of V_{Si} defect in boron-doped Si	KHIRUNENKO Lyudmila
15_627	The Diffusion Behavior and Electrical Characteristics of Ru Interconnect with Polycrystalline MoS ₂ Diffusion Barrier	JHAN Dun Jie
16_2411	Density functional theory study of multi-interstitial defects complexes in germanium	ABDURRAZQAQ Abdulgaffar
17_2001	Gibbs free energy for MoO ₂ Cl ₂ reaction on SiO ₂ surface by density function theory	KIM Hyun-Kyu
18_2043	Two-dimensional carrier gas at a polar interface without surface band gap states: A first principles perspective	BRIVIO Federico
19_2095	Two-dimensional van der Waals heterostructures for energy-efficient tunneling transistors	IORDANIDOU Konstantina
20_69	General Purpose Machine Learning Interatomic Potential for Silicon-Germanium	MILARDOVICH Diego
21_2050	Ab-initio study of the effects of Pb intercalation in Graphene/SiC heterostructures	BROZZESI Simone

22_1380	Tuning the Schottky Contacts of graphene/ phosphorene heterostructure: a DFT study	MURONI Alessia
23_893	TCAD modelling of a-Si:H devices for particle detection applications	PASSERI Daniele
24_1206	Post growth thermal treatments of Si _{1-x} - yGe _x Sny alloys	STEUER Oliver
25_43	New method for the deposition of thin films on the inner walls of a deep cavity: application to germanium doping	CARRARO Chiara
26_1476	Strained sintered mesoporous silicon epifoils for IIIIV/Si integration and substrate reuse	SANCHEZ-PEREZ Clara
27_2200	Properties and perspectives of supersaturated (Si)Ge nanosheets grown via molecular beam epitaxy at ultra-low temperatures	ABERL Johannes
28_827	Impact of annealing schemes on the formation and agglomeration of thin Ni(Pt)Si film for advanced 3D imagers technologies	MORRIS ANAK Fabriziofranco
29_2081	In-situ transmission electron microscope observation of nickel metal-induced crystallization on a-Si	HSIANG Chen-Chih
30_2202	Study of interfaces in nickel-based silicides through a multi-level modeling strategy	JARA Cesar
31_189	Influence of the type of interlayer on current transport mechanisms and defects in n-ZnO/ZnCdO/p-Si and n-ZnCdO/ZnO/p-Si heterojunctions grown by molecular beam epitaxy	SZYMON Radoslaw
32_1572	Phase transition control of crystalline Ga ₂ O ₃ grown on sapphire (0001) by MOCVD	KIM Hyeong-Yun
33_1915	Deposition of Ga ₂ O ₃ and ZnGa ₂ O ₄ thin films by liquid metal target sputtering	ZUBKINS Martins
35_805	Wafer-Scale Production of 2D SnSe: Synthetic Platform for Van der Waals Semiconductor-Based Broadband Photodetectors	JO Hyeong-Ku
36_605	Formation of High-k Al-doped ZrO ₂ Dielectric Using a New Cocktail Precursor	KIM Hyeong
37_1030	Effect of dopant distribution on the remanent polarization of La-doped HfO ₂ thin films	JEONG Ju Young
38_1019	Ferroelectricity of La doped Hf _{0.5} Zr _{0.5} O ₂ Films Deposited by Atomic Layer Deposition using Supercycles	HAN Yoogeun

39_1647	Oxygen Vacancy Control-mediated Ferroelectricity Enhancement in Hafnium Zirconium Oxide Via DUV Photoactivation	LEE Sangwoo
40_458	Chemical design of magnetoelectric GaFeO ₃ epitaxial thin films	NASUI Mircea
41_861	Engineering Transition Metal Oxide and Transition Metal Dichalcogenide Memristive Devices for Neuromorphic Systems	LINKENHEIL Anna
42_113	Mist-CVD Deposited c-Axis Aligned Crystalline ITZO Thin Film and Its Application to Thin-Film Transistor	LIU Han-Yin
43_1238	A comprehensive study of the influence of various deposition parameters on the physical properties of ZnO:Al thin transparent conducting films	RACZ Adel Sarolta
44_1103	High mobility Oxide Thin Film Transistor with amorphous In-Ga-Sn-O fabricated by RF-magnetron sputtering	HYUNIL Jo
45_1125	Growth Control, Optical and Structural Characterization of Layered Gallium Sulfide Films Prepared by Chemical Vapor Deposition	DICORATO Stefano
46_1992	Growth of MoSe ₂ -MoS ₂ core-shell in-plane heterostructure TMDs using Chemical Vapor Deposition	LIM Insu
48_1827	Photothermal reaction based Low Temperature Synthesis of Vertically Integrated Two-dimensional Heterostructure	JEON Min-Ji
47_2454	Phase Change Sb ₂ S ₃ films grown by Chemical Vapor Deposition	GIANGREGORIO Maria Michela
49_625	Manifestation of Eu dopants in Raman spectra and doping concentration profiles of {ZnCdO/ZnO} superlattices	PERLIKOWSKI Igor
50_1441	Effect of gallium doping on structural and transport properties of the Topological Insulator Bi ₂ Se ₃ by molecular beam epitaxy	PÉREZ RODRÍGUEZ Ana
51_100	Extraction of single-walled carbon nanotubes of defined chirality with conjugated polymers in organic solvents	JANAS Dawid

Wednesday May 31

M09

Metrology and Characterization II

Chairperson(s) : VANTOMME André

Schuman (1st floor)

10:00	2577	INV	Combining cutting-edge metrology techniques and TCAD to support device integration towards the 2nm Technological Node and Beyond	EYBEN Pierre
10:30	1933		Scanning Spreading Resistance microscopy on dopant profiles in elemental and compound semiconductors	BÖCKENDORF Tim
10:45	391		Local Strain and Alloy Composition in Ge _{1-x} Sn _x Microdisks: A Study by X-ray Nanoprobe	ZOELLNER Marvin Hartwig
11:00	864		Capacitance-Voltage Measurements on SiC-Based MOS Structures: What Information Can We Get from Them?	BURENKOV Alex
11:15	1399		On the bulk photovoltaic effect in non-uniformly strained Germanium	MANGANELLI Costanza Lucia
11:30	1447		Deep multi-energy proton implantation in silicon: a SIMS study	SAMPERI Orazio
11:45	1713		Photoemission Spectroscopy on photoresist materials: A useful tool to use with caution	SAJJADIAN Faegheh

Wednesday May 31

M10

Simulation and Modeling III

Chairperson(s) : LA MAGNA Antonino

Schuman (1st floor)

13:30	2698	INV	Material Engineering for Advanced CMOS Technology	MOROZ Victor
14:00	2325		Gate-All-Around SRAM: Performance Investigation and Optimization Towards Vccmin Scaling	VYAS Pratik B
14:15	2002		Impact of solid and liquid phase reflectivity on the ultra-fast laser melting of silicon-germanium alloys	RICCIARELLI Damiano

14:30	2074		Boron diffusion in germanium and the impact of oxygen	KIPKE Felix
14:45	623		Generation and loss of hydrogen-boron pairs in fired silicon wafers	VORONKOV Vladimir

Wednesday May 31

M11

Silicides and Germanides II

Chairperson(s) : GREGOIRE Magali

Schuman (1st floor)

15:00	964	INV	Some challenges and issues for contacts formation and stability in microelectronics	MANGELINCK Dominique
15:30	1332		NiGe formation on thin Ge films by flash lamp annealing: electrical properties	REBOHLE Lars
15:45	1046		NiSi ₂ /Si interface with segregation of one-atomic Au layer in a silicide-embedded silicon nanowires	WU Chia-Yi

Wednesday May 31

M12

Applications in Advanced Devices

Chairperson(s) : ENGLAND Jonathan

Schuman (1st floor)

16:30	844		Back-end-of-line and flexible substrate compatible ferroelectric memories for neuromorphic computing and adaptive sensing	MAJUMDAR Sayani
16:45	1029		Indium Gallium Zinc Oxide Based Ferroelectric Thin Film Transistors for Content Addressable Memory Cell Applications	DE Sourav
17:15	1114		Impact of ferroelectricity on the electron-phonon coupling at oxide interfaces	HUSANU Marius Adrian
17:30	1272		Site-controlled fabrication of integrated graphene nanoribbons-based quantum dot devices using scanning probe nanopatterning	LIU Xiao
17:45	1312		Physically Unclonable Functions Capable of Preventing Machine Learning Hacking Attacks Obtained by Disordered Interfacial-doping of Graphene Using Mixed Self-assembled Monolayers	LEE Subin

18:00	1493	New technologies for High Purity Germanium segmented detectors: from virgin crystals to innovative devices.	BERTOLDO Stefano
18:15	2484	Different Schottky barriers have been obtained by varying the Schottky metal and deposition parameters	MILAZZO Simone

Thursday June 1

M13

Substrate Technologies and Layer Synthesis II

Chairperson(s) : RADU Ionut

Schuman (1st floor)

10:00	1555	INV	Strain engineering of Si/Ge heterostructures based on Ge virtual substrates	SAWANO Kentarou
10:45	920		Synthesis of MoS2 layers by sputter deposition and pulsed laser annealing.	TONON Alessandro
11:00	2166		Growth of transferable germanium membranes on porous substrate for flexible optoelectronics	HANUS Tadeas
11:15	1337		Van der Waals epitaxy of CdTe on 2D surfaces	TOURARD Enguerrand
11:30	2011		Lamellar GeP thin films: a first step on the road toward 2D-GeP	STOFFEL Mathieu
11:45	2197		Synthesis of relaxed Ge _{0.9} Sn _{0.1} /Ge by nanosecond pulsed laser melting	DI RUSSO Enrico

Thursday June 1

M14

Simulation and Modeling IV

Chairperson(s) : HEMERYCK Anne

Schuman (1st floor)

13:30	1168	INV	Multiscale simulations of critical processes for the fabrication and functionalization of nanostructures	LA MAGNA Antonino
14:00	1655		Multi-Threshold Voltages Enablement Using Oxide Dipoles in WFM-Less Gate Stack for n- and p- Type GAA Devices	JADAUN Priyamvada
14:15	2089		A simulation workflow to couple the meso and atomistic scale for the CVD epitaxy of Si and SiGe-based structures	FISICARO Giuseppe
14:30	433		Accurate and efficient 3-D analytic model of ion implantation based on Legendre polynomials	ZOGRAPHOS Nikolas
14:45	1363		TCAD process simulation of self-limiting oxidation of silicon nanowires	ROSSI Chiara

Thursday June 1

M15

Silicides and Germanides III

Chairperson(s) : ALBERTI Alessandra

Schuman (1st floor)

15:00	2154	INV	Tuning nickel silicide properties via ion implantation: the role of defects and impurities	VANTOMME André
15:30	898		Formation of the C54-TiSi ₂ phase using nanosecond laser annealing and RTA enhanced by amorphous silicon	GUELLADDRESS Reda
15:45	614		Influence of the Si surface preparation on CoSi ₂ agglomeration	NEWMAN Andréa

Thursday June 1

M_P02

Poster session 2

Etoile (1st floor) - 4.30 p.m to 6.30 p.m

01_1404	A low-temperature route to the green synthesis of CsPbBr ₃ films on rigid and flexible substrates	SIRNA Lorenzo
02_1200	A new Combinatorial Approach for Solution Deposition of Thin Films	ZAKAY Noy
03_126	Pulsed 193 nm Excimer laser processing of 4H-SiC(0001) wafers with radiant exposure dependent "in situ" reflectivity studies for process optimization.	DELMDAHL Ralph
04_1026	Investigation of the dopant activation in ultra-highly B-doped Si _{1-x} Gex films	LEE Kiseok
05_1506	Wet etching characteristics of poly-Si depending on the various structures for advanced 3D integrated circuits	JI Sanghyeon
06_1539	Impact of Si ₃ N ₄ stoichiometry on the formation of an AlN layer in an Al/Ti/Si ₃ N ₄ thin film system during AlGaIn/GaN Ohmic contact formation for HEMT device	COLOMBO Selene
07_1159	Neuromorphic Synapse Implementation using InOx Interfacial Layer in InAs Nano-Wire Field-Effect Transistor	LEE Junseo

08_1574	Symmetric nitride-based ambipolar transistors with tunable electrical properties by high electronegativity dopant	PARK Ji-Min
09_2488	Fabricating Cfet Devices with Vertically Stacked P/N Si Channels Using Ge/Si 2D Epitaxy and High Ge/Si Selective Etching Ratio	CHUN-LIN Chu
11_1868	Electrical properties of graphene field-effect transistor (GFET) by minority carrier resistance effect of graphene	GU Taejun
12_1865	Electrical Characteristics (80 – 525 K) of High Quality Pt SBDs Fabricated on HVPE-Grown β -Ga ₂ O ₃ Epilayers	SHEORAN Hardhyan
13_138	Reliable Multiply-Accumulate Operation of a Ru/TaOx/Si:ZrOx/TiN Stacked Device	SEO Hyun Kyu
14_149	Tailoring the multilevel resistive switching characteristics of hafnium oxide-based memory devices by differential work function engineering	S. P. Swathi
15_1626	Self-assembled Tantalum oxide/2H-TaS ₂ as van der Waals Platform of Multilevel Memristor Circuit with β -Ga ₂ O ₃ Transistor	KIM Taewook
16_1674	Multiply-Accumulate Operation on One Selector-One Resistor(1S1R) 32 x 32 crossbar arrays	LEE Su Yeon
17_2155	Synthesis of Large-Area Monolayer MoS ₂ for Two-Terminal Neuromorphic Devices with Short-Term Memory	THOOL Asmita
18_2204	Transposable 1T-SRAM for neuromorphic computing	LIM Doohyeok
19_2508	Resistive switching properties of Cu _x O films through phase transition during low-temperature annealing	KIM Eun Kyu
20_2514	Synthesis and memristor properties of CVD grown ReS ₂ thin film: Change from DRAM to WORM	AGGARWAL Pallavi
21_772	Deposition of TiO ₂ Thin Films by Mist Chemical Vapor Deposition and Their Application to Resistive Random Access Memory	CHENG Yun-Yun
22_1007	Efficient Inverted Tandem Structure of Quantum Dot Light-Emitting Diodes with Inorganic Charge Generation Layers	LEE Kwangkeun
23_1058	Ligand exchanged highly dispersed NiO nanoparticles for hole injection layer of Quantum Dots LED	HYOJUN Lim

24_1338	Interplay between strain, Sn content and temperature in GeSn optoelectronic devices	ZAITSEV Ignatii
25_1544	Investigation of Chiral Halide Perovskite/III-V LEDs with Circularly Polarized Emission	HAUTZINGER Matthew
261921	Carrier dynamics and structural properties of hybrid orange-red LED based on In-rich InGaN/GaN multiple quantum wells	ALAMOUDI Hadeel
27_1926	Studying the carrier dynamic of pyramid-shaped InGaN/GaN micro-light-emitting diodes (μ -LEDs) by using Time-resolved photoluminescence	ALRESHIDI Fatimah
28_333	Al _x Zn _{1-x} O-based Ultraviolet Photodetectors with Tunable Cutoff Wavelength from Near-UV to Deep-UV	CHEN Wei-Han
29_1250	Gate/Light Co-Tunable Negative Differential Resistance Behaviors and 9 by 9 Photodetectors Array from Small-Molecules Heterostructure	JEON Yunchae
30_1703	Effect of Sn ⁺ ion implantation and post-annealing on enhancing β -Ga ₂ O ₃ -based DUV self-powered photodetector performance	UPADHYAYA Kishor
31_1223	Photosensitive graphene field-effect transistor with porous silicon supporting layer	OLENYCH Igor
32_834	Large area 4H-SiC Schottky barrier diodes as radiation detectors	KNEZEVIC Tihomir
33_1521	Ultrafast low power room temperature H ₂ gas sensor based on atomically sharp nanopatterned exfoliated MoS ₂ flakes	AGRAWAL Abhay Vivek
34_1801	Mercury (II) Selective Probe by Thin Film Transistor Based on Supramolecular Flavin-Wrapped Single-Chirality Single-Walled Carbon Nanotube	KIM Dong Hwan
35_2554	A High-temperature stable Self-driven Broadband-photodetector based on MoS ₂ /GaN Heterostructure.	VASHISHTHA Pargam
36_2645	Exploring light trapping of nanopillar arrays decorated with self-aligned quasi-nanolenses using near-field optical microscopy	KUMAR Ankit
37_2674	Development of AlGaAsBi for the Next Generation of APDs	CARR Matthew
381922	Synthesis of Pb-free Ag-Bi-based double perovskites thin films for photovoltaic applications	RUIZ RAGA Sonia

40_1928	Template synthesis and experimental-theoretical study of a new type of heterostructures	DAULETBEKOVA Alma
41_1084	3D-printed metasurface structure with thermal-compressed circuit patterns for phase shifter fabrication	LEE Gyeongyeong
42_1205	Electrical Conductivity and Light Sensing based on 3D Printed Nanoporous Structures	XIA Kai
43_1373	Oxide Nanopatterning using Sequential Infiltration Synthesis – In Situ FTIR study	BISWAS Mahua
44_480	Development of nanoelectromechanical device based on complementary metal oxide semiconductor for three dimensional integrated associative memory-augmented neural networks	JUNG Sang Hyun
45_876	Effect of stress and different crystal orientations on 3C-SiC resonator	LA VIA Francesco
46_2335	Investigation of Thermal ALD deposited AlOx and HfOx bilayer films for Silicon Surface Passivation	DEVI Meenakshi
47_1889	Design rules for selective deposition of silver by condensation coefficient modulation	ABRAHAMCZYK Szymon
48_1716	Control of interfacial reaction between high TC superconductor Tl ₂ Ba ₂ CaCu ₂ O ₈ and topological insulator Bi ₂ Se ₃	CHUNG Yong-Duck
49_1023	Elucidating the effects of impurities on interfacial void formation of Cu and Sn-Ag electrodeposits	JO Yugeun

Friday June 2

M16

Power Devices II

Chairperson(s) : PAGANO Daniele

Schuman (1st floor)

08:45	77	INV	Advanced Processes for Power Devices	SCHUSTEREDER Werner
09:15	342		Heteroepitaxy 3C-SiC/Si Power Devices - Key Materials Challenges	WARD Peter
09:30	2096		Defect formation in 3C-SiC grown on compliance Si substrates	BONINELLI Simona
09:45	1911		Impact of doping on the stress evaluation of Si/3C-SiC hetero-epitaxy	LA VIA Francesco

Friday June 2

M17

High-Mobility Electron Devices

Chairperson(s) : BAZIZI El Mehdi

Schuman (1st floor)

10:30	344	INV	Enabling High-capacity 6G Wireless Communication: Harnessing the Potential of InP Semiconductors	COLLAERT Nadine
11:00	610		Isolation of Bidimensional Electron Gas in AlGaIn/GaN Heterojunction using C, Fe and Ar Ion Implantation	SCANDURRA Antonino
11:15	1939		Fabrication of Self-aligned Quantum Well InGaAs MOSFETs for High Frequency Applications	GARIGAPATI Navya Sri
11:30	152		Qualitative and quantitative defect analysis of high mobility InGaZnO oxide thin film transistor with polyimide insulator	KIM Min Jung
11:45	72		Mechanical Stress Confinement Effects on Microelectronics Reliability	HAQUE Aman