



European Materials Research Society

# 2025 Spring Meeting

May 26 – 30 | Strasbourg Convention Centre

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## SYMPOSIUM A

Carrier transport, photonics and sensing in group IV-based and other semiconductors

Oral sessions : MARIE CURIE A – FIRST FLOOR

Poster sessions : ETOILE – FIRST FLOOR

Symposium Organizers:

Chao ZHAO, Beijing Superstring Academy of Memory Technology, China

Chaoliang TAN, City University of Hong Kong, Department of Electrical Engineering, Hong Kong

Henry H. RADAMSON (Main organizer), Mid Sweden University, Department of Electronics Design, Sweden

Isabelle BERBEZIER, Institut Matériaux Microélectronique et Nanosciences de Provence (IM2NP), CNRS – AMU, France

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Monday May 26

A01 Material Performance

Chairperson(s): HENRY H. RADAMSON

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08:30	192	Innovative cooling nanodevices based on III-V heterostructures <b>BESCOND Marc (Invited)</b>
09:00	717	Nanosecond electro-optical pulsing perovskite light-emitting diodes <b>NGUYEN Hong-Hai</b>
09:15	1053	Electrically gated organic-based metadvice for THz amplitude modulation <b>CINQUANTA Eugenio</b>
09:30	1330	Demonstration of perpendicularly magnetized Mn-Ga alloy films on Ge(100) <b>NISHIOKA Makoto</b>
09:45	1329	Observation of magnetoresistance effect in vertical Co <sub>2</sub> FeAl <sub>0.5</sub> Si <sub>0.5</sub> /Ge/Co <sub>2</sub> FeSi heterostructures <b>WATAHIKI Shimon</b>

Monday May 26

A02 Innovative materials in electronics and photonics

Chairperson(s): YUAN HAO MIAO

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10:30	760	SiGe/Si Heterostructures for CMOS and V5 DRAM, a new Technology Development <b>Wang Guilei (Invited)</b>
11:00	1660	Investigating the local properties of optoelectronic materials with a hard X-ray nanoprobe <b>BONINO Valentina</b>
11:15	1714	InAs Nanowires for NMOS Logic and Optoelectronic Memory <b>ALEXANDER-WEBBER Jack</b>
11:30	1108	New designs of Ge-on-Insulator (GOI) for high performance SWIR detection and imaging <b>ZHAO Xuewei</b>
11:45	1558	Luminescence properties of GeSn laser materials: influence of buffered-substrates <b>AAGAARD Martin</b>

Monday May 26

A03 Transistors

Chairperson(s): ZHAO Chao

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13:45	1689	Organic Field-effect Light-emitting Transistors <b>ZHONGBIN Wu (Invited)</b>
14:15	927	Implementation of reconfigurable logic functions in dual-gate field-effect transistors <b>XU Jianbin</b>
14:30	901	Combining electrical characterizations and microstructural analyses on 150 nm GaN HEMT technology for defects mechanism study <b>Meknassi El Mehdi</b>
14:45	1337	Analysis of Polarity-Dependent Threshold Switching Behavior and Conduction Mechanisms in Ovonic Threshold Switch <b>Choi Byung Joon</b>
15:00	1448	Ge-based lateral spin-valve devices fabricated on Ge on insulator <b>OKI Kenji</b>
15:15	2572	Overcoming the Challenges Associated with Solution Gating in Field-Effect Transistor-Based Biosensors <b>GARIKA Vijay Kumar</b>
15:30	205	Indium-Tin-Zinc Oxide-Based Thin-Film Transistor for low power, long-retention 2T0C capacitorless gain-cell memory <b>PARK Jeong-Min</b>
15:45	1652	Contact Resistance in Organic Transistors <b>XU Jianbin</b>

Monday May 26

A04 Material deposition & applications

Chairperson(s): HENRY H. RADAMSON

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16:30	638	Appearance of the highest mobility holes in a 2D system epitaxially grown on a silicon wafer <b>MYRONOV Maksym (Invited)</b>
17:00	767	High-Performance Optimization of Epitaxial Ge/SiGe Quantum Wells: A Balance of Strain, Mobility, and Percolation Density <b>ZHANG Yiwen</b>
17:15	762	High Mobility SiGe/Ge 2DHG Heterojunction: Modulation and Optimization of the Interface <b>Wang Guilei</b>

17:30	2111	Epitaxial growth of record-low threading dislocation density GaSb on Si buffer template with optimized multiple-defect filter layers for high-performance MWIR applications <b>YEON Eungbeom</b>
17:45	2239	Single Crystal Growth and Characterization of ZnCdTe via Modified Bridgman Technique for Terahertz Device Applications <b>MAHAJAN Sandeep</b>
18:00	1277	MOCVD growth of InAs/GaSb Type-II superlattices on GaAs substrates for infrared detectors <b>LI Qiang</b>
18:15	2532	Growth geometry-dependent defect studies of layered molybdenum disulphide <b>EGINLIGIL Mustafa</b>

Tuesday May 27

A05 Optoelectronic materials & performance

Chairperson(s): MYRONOV Maksym

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08:30	186	Chalcogen hyperdoped Silicon for monolithically integrated infrared optoelectronics <b>ZHOU Shengqiang (Invited)</b>
09:00	2106	Exploitation of the dewetting natural instability in rigid and flexible Si-based films for bacteria detection <b>BOLLANI Monica</b>
09:15	1858	Automated High-Throughput Identification and Characterisation of Single p-i-n Nanowires for Photovoltaics <b>RATNAYAKE Isuri</b>
09:30	1797	Correlative study between nanoscale structure and luminescence of SrVO thin films for white light devices <b>TALBOT Etienne</b>
09:45	1646	Preparation of gallium-lithium co-doped silicon wafers as radiation hardened materials <b>SERON Charles</b>

Tuesday May 27

A06 Light sensing

Chairperson(s): WANG Guilei

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10:30	44	Quantum sensing with hexagonal BN <b>ZUNIGA-PEREZ Jesus (Invited)</b>
11:00	2003	High-responsivity Ultra-thin-Pt/n-Si Schottky Photodiode with ZnO Resonant Cavity for IR Detection <b>HSU Klaus Yung-Jane</b>
11:15	3215	Development and Prospects of Germanium-on-Insulator Short-Wave Infrared Imaging Technology <b>Qi Xuan</b>
11:30	645	Boosting GOI Photodetector Performance with Multiple SiO <sub>2</sub> /Si <sub>3</sub> N <sub>4</sub> DBRs Towards Next-Generation SWIR Imaging Application <b>DUAN Xiangliang</b>
11:45	2737	Anisotropic transport properties of Cr <sub>2</sub> TiAlC <sub>2</sub> MAX phase synthesized by reactive SPS <b>BAUDOUIN Florent</b>

Tuesday May 27

A07 Carrier transport

Chairperson(s): YUAN HAO MIAO

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13:45	211	Metal Chalcogenides for Robust Electronics <b>HO Johnny (Invited)</b>
14:15	2740	Optimising Schottky Junctions on Silicon for Enhanced Ozone Detection <b>VARDHAN Vaishali</b>
14:30	2591	Tuning the electronic properties in oxide semiconductor thin films for FeFET applications <b>SHEPELIN Nick</b>
14:45	2139	Magnetoresistance and charge carriers transport in transparent conducting oxide semiconductors <b>ZŁOTNIK Sebastian</b>
15:00	2578	AlGaIn/GaN HEMTs: DLTS Investigation, Carrier Transport, and Applications in Nanoelectronics and Sensing <b>MOSBAHI Hana</b>
15:15	1046	Microstructure evolution of CdZnTe crystal irradiated by heavy ions and its effect on electrical and carrier transport properties <b>LU Liang</b>



16:30	26_2331	Understanding the Impact of Coherent and Incoherent Charge Carriers in Doped Conjugated Polymers <b>IM Jaemin</b>
16:30	27_2508	Thermal conductance measurement at group IV and III-V semiconductor/metal nanostructure interfaces using Time-resolved Extreme Ultraviolet diffractometry <b>BABU Arun</b>
16:30	28_2523	Formation of crack-free strained SiGe/Ge by selective ion implantation <b>RYOTA Mizoguchi</b>
16:30	29_2747	Impact of 120 MeV gold ion irradiation on electrical properties of ZnGa <sub>2</sub> O <sub>4</sub> thin film grown by MOCVD <b>RANA Siddharth</b>
16:30	30_2768	Gold nanoparticles in plasmonic metasurface cavity assisted SERS detection of R6G and melamine <b>SOLANKI Urvashi</b>
16:30	31_2800	Understanding Signal Generation Mechanisms in Aptamer-based CNT-FET Biosensors <b>MIAO Haosen</b>
16:30	32_2933	Meta-nano-channel (MNC) field-effect transistor based specific and label-free sensing of the biological interactions between RNA-small molecule <b>RAJPOOT Surbhi</b>
16:30	33_3099	Biological transistor (bioFET) for the specific and label-free sensing of CRP in unprocessed blood <b>Babbar Shubham</b>
16:30	34_619	Probing surface-related carrier recombination kinetics in silicon with photoexcited muon spin spectroscopy <b>YADAV Anup</b>
16:30	35_858	Heterostructure based strontium niobate thin films on STO: unlocking exceptional electrical conductivity by interface effect <b>SAADE Anthony</b>
16:30	36_903	Electrical Conduction Mechanisms in Rare Earth-doped WO <sub>3</sub> Ceramics: Experimental and Theoretical Approaches <b>NEHRA Pooja</b>
16:30	37_904	Frequency and temperature dependent electrical conductivity and impedance studies of doped perovskites material <b>KUMAR Anil</b>
16:30	38_905	Frequency and temperature dependent electrical conductivity and impedance studies of barium titanate based materials <b>KUMAR Anil</b>
16:30	39_906	Impact of Gate Length on the Electrical Characteristics of Junctionless FDSOI SiGe channel p-FinFET <b>ZHAO Xuewei</b>

16:30	40_936	Effect of stacking faults on minority carrier lifetime in 4H-SiC epilayers by time-resolved photoluminescence <b>MOONKYONG Na</b>
16:30	41_998	Investigation of high concentration phosphorus doping in Ge and GeSi layers on Si substrate <b>ZHAO Xuewei</b>
16:30	42_999	High-Performance Poly-Si Nanowire Field-Effect Transistor Enabled by Ni-Induced Lateral Crystallization <b>Sun Xianglie</b>
16:30	43_301	Ambient sensing through p-n junctions based on metastable zinc nitride films on silicon <b>REDONDO CUBERO Andrés</b>

Wednesday May 28

A09 Photonic related materials and applications

Chairperson(s): ZHAO Chao

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08:30	583	Synthesis and phase engineering of metal chalcogenides for electric and optical applications <b>LIU Zheng (Invited)</b>
09:00	2729	Anomalous Multi-Particle Coupling in Perovskite Nanocrystals with Metal Nanodroplets Interface <b>BANSWAR Durgesh</b>
09:15	1407	Monolithic Trichroic MicroLED Display with Selective Etched Nanopillars <b>Choi Hoi Wai</b>
09:30	2463	Plasmonic properties of ultra-doped Silicon <b>YAM Vy</b>
09:45	472	Fully Reconfigurable Photodiode with Integrated Color-Sensing Capability <b>GUO Xiaokun</b>

Wednesday May 28

A10 Material deposition challenges

Chairperson(s): TAN Chaoliang

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10:30	2934	High-resitivity silicon: from challenges to opportunities <b>ABBADIE Alexandra (Invited)</b>
11:00	1915	Pressure-driven structural evolution of crystalline silicon thin films on SiO <sub>2</sub> /Si substrates via ultra-low-pressure thermal CVD <b>MONIKA</b>

11:15	1560	Harnessing defects for spintronics in Ge heterostructures <b>PEDRINI Jacopo</b>
11:30	1404	Mist chemical vapor deposition of alloy gate insulator for potential applications in GaN-based MOS devices <b>YATABE Zenji</b>
11:45	1264	Fabrication by MOVPE deposition of a $\beta$ -Ga <sub>2</sub> O <sub>3</sub> /SiC interface and its characterization <b>LICCIARDELLO Nadia</b>

Wednesday May 28

A11 2D crystals

Chairperson(s): HENRY RADAMSON

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13:45	63	After Twenty Years of 2D Materials Research, What Have We Learned About Device Applications <b>KOESTER Steven (Invited)</b>
14:15	2902	From optical response to thermal properties: investigating Xenex and their heterostructures <b>BONAVENTURA Eleonora</b>
14:30	2584	Strain Engineering and the Impact on the Thermoelectric Properties of two-dimensional semiconductor HfNBr <b>SANGEETA Sangeeta</b>
14:45	2391	Growth mechanisms of silicene and germanene on CVD epitaxial graphene <b>ARETTE-HOURQUET Adam</b>
15:00	2115	Functionalization and performance control of field-effect transistors based on 2D materials <b>HAN Bin</b>
15:15	612	Novel Graphene Adjustable-Barriers Phototransistor with Tunable Ultra-High Responsivity <b>STROBEL Carsten</b>

Thursday May 29

A12 Defects & thermal analysis

Chairperson(s): KOESTER Steve

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08:30	272	Molecular junctions with molecularly induced two-dimensional interfacial states within their leads result in thermopower in the mV/K range. <b>SELZER Yoram (Invited)</b>
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09:00	2475	Topological Insulator Grating Structures: Exploring Disorder Effects on Plasmonic and Spintronic Transport in Semiconductor Technologies <b>ROQUE Carlos</b>
09:15	565	Investigation of the surface quality using surface photovoltage mapping equipment <b>GRIEGER Lars</b>
09:30	804	Self-Powered Transparent Photodetector for Broadband Vision and Wide-Field Subretinal Function <b>BHATNAGAR Priyanka</b>

Thursday May 29

A13 innovative materials & designs

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10:30	630	Prospects of Isotope-pure SiGe Heterostructures for Quantum Technologies <b>GRADWOHL Kevin-Peter (Invited)</b>
11:00	2606	Temperature-Dependent Structural and Quantum Transport Properties of Ge <sub>2</sub> Sb <sub>2</sub> Te <sub>5</sub> thin films <b>MAGANINHO João</b>
11:30	1554	Mobility and Quantum Fractional Hall Effect in Advanced Hall-Bar Devices <b>MAJNOON Farnaz</b>
11:45	2169	Influence of laser annealing kinetics on Phase Change Mechanisms in Ge-rich GeSbTe <b>BOTTIN Nicolas</b>

Thursday May 29

A14 Light Detection & Light Emission

Chairperson(s): TAN Chaoliang

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13:45	281	Development of Ge on Si single photon avalanche diode photodetectors at telecoms wavelengths <b>PAUL Douglas (Invited)</b>
14:15	2887	Short-wave infrared photosensing of SiGeSn-HfO <sub>2</sub> films <b>LEPADATU Ana-Maria</b>
14:30	2881	Enhancing GeSn LED light extraction using surface patterning for cost-effective gas sensing applications <b>GOULAIN Paul</b>
14:45	2786	Enhanced optical emission via band structure engineering of direct-gap Ge polytype quantum wells <b>BRODERICK Christopher</b>



15:00	1401	On demand control of the strain state and laser gain curve in Ge-GeSn microbridges <b>BARD Antoine</b>
15:15	742	Enhanced Visible-to-SWIR Photodetection Enabled by Layered WS <sub>2</sub> Heterojunction with Light-trapping Pyramidal Black Germanium <b>BHATTACHARYA Kritika</b>
15:30	141	Nanostructuring of GaN: Towards Single-Photon Emission for Quantum Technologies <b>SALLAH Antouman</b>
15:45	2407	Leapfrogging in Performance of Copper Halide LEDs via Device Engineering and Process Control <b>K Sajeev Anjali</b>

Thursday May 29

AP04 Poster Session 2

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16:30	01_1009	Dual-band infrared thin-film photodetector with dislocation-assisted photoconductive gain <b>WOO Seungwan</b>
16:30	02_1271	Ohmic and rectifying contact to graphene: A route towards a side-gated 2D materials <b>KUNC Jan</b>
16:30	03_14	Comparison of optical and luminescence properties of as prepared and annealed ZnO nanoparticles prepared using sol-gel method <b>DEJENE Francis</b>
16:30	04_1512	E-beam irradiation effects on defect states in HfO <sub>2</sub> in highly doped III-V MOS structures <b>Polito Raffaella</b>
16:30	05_16	High-Performance Photodetector from p-n Junction of Vertically Aligned SnS <sub>2</sub> and Reduced Graphene Oxide <b>DAS Chayan</b>
16:30	06_167	Non-Destructive Evaluation of Dopant Concentration in Ultrathin Silicon Films Using Time-Dependent Second Harmonic Generation <b>YEN Ting Yu</b>
16:30	07_173	Machine Learning Approach to Develop a Real-Time Prediction Model for H <sub>2</sub> S Gas Detection <b>KUMAR Mahesh</b>
16:30	08_212	Effects of Defects and Dopants on P-type Selenium-Doped Amorphous Tellurium Oxide: Electronic Structure and Transistor Performance from Multiscale Modeling <b>HAO Kuanrong</b>
16:30	09_2145	Study of the influence of the temperature and sodium doping on the optical and structural properties of pure sulphide CIGS <b>Dongmo Richel</b>

16:30	10_2160	Remarkable birefringence properties of n-doped porous silicon <b>MULA Guido</b>
16:30	11_2069	Engineered defects in 4H-SiC pn diodes for Photonics & QT applications <b>SCIUTO Antonella</b>
16:30	12_2209	Compact NIR Plasmonic Fiber-Optic Probe for Gas Sensing <b>Vishnu K N</b>
16:30	13_2280	Nanoindentation-Driven Formation of Textured Hexagonal Silicon Crystals <b>BIKEROUIN Mouad</b>
16:30	14_2295	Surface Plasmon resonance glucose sensor based on RF sputtered titanium nitride thin films – a simulation study <b>TONY Liya</b>
16:30	15_2349	Nonequilibrium carrier-lattice interactions on temporal interfaces <b>VASILEIADIS Thomas</b>
16:30	16_243	Curious Case of CsPb <sub>2</sub> Br <sub>5</sub> : Extremely Soft Structure-Induced Broad band Emission <b>PRADHAN Jayita</b>
16:30	17_2631	Heterostructures of Gallium Oxide and interface engineering for high response, stable and fast photodetector <b>PRADHAN Moumita</b>
16:30	18_2635	Study of dielectric permittivity of PM6:Y6 polymer blend with the incorporation of LiTFSI <b>RAJAN Lakshmi</b>
16:30	19_2667	Application of CePO <sub>4</sub> Nanoneedles towards the detection of neurodegenerative diseases <b>MAZON Talita</b>
16:30	20_2788	Influence of quantum dot density on steady-state and transient photocurrent spectra in GaAs/InAs(QD)/GaAs structures <b>SCHWARZ Reinhard</b>
16:30	21_312	Graphene-based extraordinary magnetoresistance devices: From fabrication to characterization <b>NGUYEN Huyen Phuong</b>
16:30	22_323	Capacitorless 1T-DRAM Utilizing Positive Feedback Process for Scalable Cryogenic Quantum Computers <b>KIM Hakin</b>
16:30	23_325	A sensitive and reliable extended-gated field-effect transistor for trace biomolecules detection <b>WU Chi-Chang</b>
16:30	24_369	Research and Fabrication of high-quality GOI and GeSnOI Substrates <b>RADAMSON Henry H.</b>
16:30	25_421	Superconductivity in Ga doped SiGe alloys through Ion-Implantation and Flash Lamp Annealing <b>CHENG Yu</b>

16:30	26_422	Enhancing Positive Bias Stress Stability in Amorphous InGaZnO Thin-Films Through in-situ Dehydrogenation <b>LEE Junseo</b>	16:30	43_649	Investigation of FDSOI devices performance with Epitaxial SiGe source/drain structures at cryogenic temperatures <b>RADAMSON Henry H.</b>
16:30	27_487	Fabrication and high temperature electrical conductivity of polymer-derived SiHfBCN ceramic coating <b>Xingang Luan</b>	16:30	40_2916	Photoresponsivity enhancement of the of Cu <sub>12</sub> Sb <sub>4</sub> S <sub>13</sub> thin films deposited by Glancing Angle Deposition <b>CHAFFAR AKKARI Ferid</b>
16:30	28_515	Advanced strategies for tailoring transparency window in Correlated Transparent Conductors <b>CHEIKH Aïmane</b>			
16:30	29_555	Monolayer J-aggregate Crystal Strong Coupling with an All-dielectric Metasurface for Photonic Properties Modulation <b>ZHAO Xinyi</b>			
16:30	31_646	Ultrahigh-Performance Mesa-Type In <sub>0.53</sub> Ga <sub>0.47</sub> As/InP PIN Photodetectors Enabled by Stacked Al <sub>2</sub> O <sub>3</sub> /SiNx Passivation Layers <b>RADAMSON Henry H.</b>			
16:30	32_655	Nitrogen doped High-entropy Ba(Zr,Mo,Ti,Ta,Hf)O <sub>3</sub> Films-based Thin film transistor for ultraviolet (UV) detector <b>NGUYEN Van Dung</b>			
16:30	33_705	Growth and properties of single layer graphene on Ge(100) substrate <b>RAYNEAU Loïc</b>			
16:30	34_735	Methyl Salicylate Spectroscopic monitoring by a SiC detector for Agriculture field <b>DI BARI Ivana</b>			
16:30	35_754	Development and Implementation of Copper-Based Back Side Power Delivery Network (BSPDN) Technology <b>JUNG Sang Hyun</b>			
16:30	36_757	Investigation of Cu Diffusion Prevention Using Monolayer and Bilayer Barrier Metals for Semiconductor Applications <b>Park Sung-Min</b>			
16:30	37_761	First demonstration of ultra-high 100 periods fully-strained SiGe/Si superlattice epitaxy and functional n-MOSFET for 3D DRAM <b>Wang Guilei</b>			
16:30	38_771	Investigation of In-Situ Boron-Doped Epitaxial Stacked Si <sub>1-x</sub> Gex/Si Superlattice Films <b>ZHAO Chao</b>			
16:30	39_773	200-period Si/Si <sub>0.8</sub> Ge <sub>0.2</sub> Superlattice Structure Growth and Characterization for Vertical Stacked DRAM <b>ZHAO Chao</b>			
16:30	41_849	Investigation of High-Efficiency GOI photodetectors <b>RADAMSON Henry H.</b>			
16:30	42_866	Fabrication of graphene-based sub-THz frequency mixers on integrated photonic and electronic platforms <b>MORATALLA MARTIN Manuel</b>			