

Institute of Microelectronics (IME)

No.	Department	A*STAR Supervisor's Name	Email	Designation	Project Title	Project Description	Degree Awarded By Upon Graduation	Website Link (if any)
1	Sensors, Actuators, and Microsystems (SAM)	Doris Ng	Doris_NG@ime.a-star.edu.sg	Senior Scientist I	<ol style="list-style-type: none"> 1. Pyroelectric detectors for gas sensing and IR imaging 2. New Piezo-Materials development for sensors applications 	<ol style="list-style-type: none"> 1. Development of pyroelectric detectors with high detectivity for applications in gas sensing and / or IR imaging 2. Development of low temperature novel piezo-materials with high piezoelectric coefficient 	NUS/NTU/SUTD	
2	Sensors, Actuators, and Microsystems (SAM)	Ho Chong Pei	ho_chong_pei@ime.a-star.edu.sg	Scientist II	<ol style="list-style-type: none"> 1. Micro-Electro-Mechanical Systems (MEMS) sensors for IoT applications 2. NIR / MIR Photonic devices and applications 3. MIR MEMS detector 	<ol style="list-style-type: none"> 1. Using MEMS sensor for applications such as AI in order to provide ultra low power computing capabilities. 2. To combine multiple physical /optical properties of materials for use in NIR/MIR photonic to realize multifunctional devices. 3. Design and realization of MEMS based pyroelectric detector whereby the absorption is determined by a overlying absorber structure. 	NUS/NTU/SUTD	
3	Sensors, Actuators, and Microsystems (SAM)	Lee En-Yuan Joshua	Joshua_Lee@ime.a-star.edu.sg	Principal Scientist I	<ol style="list-style-type: none"> 1. Piezoelectric Microelectromechanical Systems (MEMS) sensors and actuators 2. Radio frequency (RF) Microelectromechanical Systems (MEMS) devices for 5G 3. Materials for Microelectromechanical Systems (MEMS) characterization and device modeling 		NUS/NTU/SUTD	

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4	Sensors, Actuators, and Microsystems (SAM)	Lennon Lee Yao Ting	lennon-lee@ime.a-star.edu.sg	deputy head		<ol style="list-style-type: none"> 1. Mid-infrared photonics, microelectronics and optics 2. Gas and chemical sensors 3. Semiconductor optoelectronics, RF photonics 4. MEMS emitter and detector 5. Productization of integrated optics, photonics, MEMS and microelectronics 	NUS/NTU/SUTD	
5	Sensors, Actuators, and Microsystems (SAM)	Li Minghua	li_minghua@ime.a-star.edu.sg	Scientist III		<ol style="list-style-type: none"> 1. Scandium aluminum nitride films for electronic devices 2. Ferroelectric and piezoelectric materials characterization 	NUS/NTU/SUTD	
6	Sensors, Actuators, and Microsystems (SAM)	Li Nanxi	Li_Nanxi@ime.a-star.edu.sg			<ol style="list-style-type: none"> 1. Multi-physics, microelectronics devices 2. NIR and MIR Nano Photonic devices and applications 3. Large-scale dielectric metasurface based flat optics 	NUS/NTU/SUTD	
7	Sensors, Actuators, and Microsystems (SAM)	Lin Huamao	Lin_Huamao@ime.a-star.edu.sg	Senior Scientist I		<ol style="list-style-type: none"> 1. Fabrication technologies (etch, deposition, etc) using piezoelectric and ferroelectric thin films. 	NUS/NTU/SUTD	

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8	Sensors, Actuators, and Microsystems (SAM)	Liu Chen	liuc@ime.a-star.edu.sg	Scientist I	1. Radio frequency (RF) MEMS for mobile communication 2. Non-volatile memory and neuromorphic computing system 3. Ferroelectric AlScN based memory and edge computing devices	1. Design, simulation and fabrication radio frequency resonators and filters for the 5G applications. 2. Design, modeling and testing of the non-volatile memory devices for neuromorphic computing applications, and develop the memory-based in-memory computing and neuromorphic systems. 3. Investigate the ferroelectric AlScN material for RFMEMS, memory and edge computing applications.	NUS/NTU/SUTD	
9	Sensors, Actuators, and Microsystems (SAM)	Prakash Pitchappa	prakash_pitchappa@ime.a-star.edu.sg	Scientist II	1. THz photonics and metamaterials 2. THz wireless communication 3. Micro-Electro-Mechanical Systems (MEMS)	Development of THz photonic technologies for wireless links reaching Tbps data rates	NUS/NTU/SUTD	https://scholar.google.com.sg/citations?hl=en&user=LIZvOIIA AAAJ&view_op=list_works&sortBy=pubdate
10	Sensors, Actuators, and Microsystems (SAM)	Song Wendong	song_wen_dong@ime.a-star.edu.sg	RS4	1. Resistive random access memory (RRAM) devices 2. Phase change materials and application in memory	1. Design and fabrication of RRAM devices based on oxide materials for neuromorphic computing applications 2. Design and fabrication of analog memory devices based on phase change materials for AI applications	NUS/NTU/SUTD	
11	Sensors, Actuators, and Microsystems (SAM)	Wang Nan	wangn@ime.a-star.edu.sg	Scientist II	1. Micro-Electro-Mechanical Systems (MEMS) sensors for IoT applications 2. Radio frequency (RF) MEMS for 5G mobile communication 3. Tunable THz devices for 6G and beyond		NUS/NTU/SUTD	

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12	Sensors, Actuators, and Microsystems (SAM)	Yul Koh	Koh_Yul@ime.a-star.edu.sg	Scientist II	1. MEMS sensor platform for zero-power IoT node 2. Piezoelectric ultrasound transducers for medical imaging		NUS/NTU/SUTD	
13	Sensors, Actuators, and Microsystems (SAM)	Zhang Qing Xin	qingxin@ime.a-star.edu.sg	Senior Scientist II	1. Micro-Electro-Mechanical Systems (MEMS) device integration 2. SiC MOSFET device module development and integration		NUS/NTU/SUTD	
14	Sensors, Actuators, and Microsystems (SAM)	Zhu Yao	zhuya@ime.a-star.edu.sg	deputy head	1. Piezoelectric and ferroelectric Micro-Electro-Mechanical Systems (MEMS) based sensors and actuators 2. Radio frequency (RF) frontend for 5G and beyond 3. Radio frequency (RF) Micro-Electro-Mechanical Systems (MEMS) components - filters, phase shifters, switches, and passives 4. Thin film piezoelectric and ferroelectric material - process and characterization 5. In-memory computing AI hardware 6. Emerging non-volatile memory		NUS/NTU/SUTD	

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15	Heterogeneous Integration (HI)	Chui King Jien	chuijk@ime.a-star.edu.sg	Senior Scientist I	<ol style="list-style-type: none"> 3D Heterogeneous Integration for High Performance Computing for Deep learning Applications. 2.5D Interposer using Silicon Carbide Substrates for High Power Applications Fabrication and Characterization of Passive Devices in TSV and 2.5D Interposer. Fabrication and Characterization of Novel SiC Power Devices for Enhanced Performance 	<ol style="list-style-type: none"> Exploring wafer-to-wafer / chip-to-wafer stacking and TSV schemes for memory-logic integration for deep learning applications. Fabrication of Silicon Carbide (SiC) Interposers for improved thermal dissipaton in high power applications where high power SiC or GaN devices are assembled on the SiC interposer. Research on novel capacitor structures like high A.R. trench devices, TSV embedded MIM capacitors for RF decoupling, IVR applications. Design, fabrication and testing of novel SiC MOSFET structures (e.g. superjunction devices) for enhanced device performance. 	NUS/NTU/SUTD	
16	Heterogeneous Integration (HI)	Li Hong Yu	lihy@ime.a-star.edu.sg	Senior Scientist I	<ol style="list-style-type: none"> 3D IC and 3D packaging process integration by TSV technology. Fine pitch Cu to Cu bonding. 3D interconnect reliability. 	<ol style="list-style-type: none"> 2X10um TSV interposer process development and integraton that included the understanding of TSV process module, electrical charaterization. Multiple layers fine pitch wafer to wafer hybrid bonding study that included principle of hybrid bonding , hybrid bonding process module understand and final electrical charaterization. 	NUS/NTU/SUTD	

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17	Heterogeneous Integration (HI)	Vivek Chidambaram	nachiappanvc@ime.a-star.edu.sg	Senior Scientist I	<ol style="list-style-type: none"> 1. Dielectric materials characterization and reliability evaluation for hybrid bonding 2. Processing and reliability of fine-pitch Cu-Cu bonding for 3D chip stacking 	<ol style="list-style-type: none"> 1. Numerous dielectric material options are available for hybrid bonding ranging from SiO₂, SiN, SiCN and polymer. All these dielectric materials will be characterized from hybrid bonding perspective. Bond quality, bond strength and long term reliability will be assessed. 2. Wafer fabrication targeting aggressive pitch reduction using Cu damascene process flow. Assembly challenges for handling and multi- stacking thin dies will be evaluated. Will involve TSV interconnection technology and final electrical characterization of the assembled package. 	NUS/NTU/SUTD	
18	Heterogeneous Integration (HI)	Kawano Masaya	kawanom@ime.a-star.edu.sg	Senior Scientist III	1. High Density Heterogeneous Integration and Next Generation 3D Wafer Stacked Memory	<ol style="list-style-type: none"> 1. Wafer-level Memory stacking and Memory/Logic integration technology with fusion/hybrid bonding and through stacked wafer TSV. 	NUS/NTU/SUTD	

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19	System in Package (SIP)	Mihai Dragos Rotaru	Mihai_Dragos_Rotaru@ime.a-star.edu.sg	Senior Scientist III	1. Multi-physics informed AI solvers for heterogeneous system design, simulation and optimization; 2. Cryogenic temperature advanced packaging scalable platform for quantum computing integration;	1. To explore the possibility of interfacing AI/ML techniques with open source simulation codes – electromagnetic, thermal and mechanical solvers – with aim of enhancing their efficiency. The codes will be primarily used to simulate and solve complex problems that exist in heterogeneous system design that uses advanced packaging technologies. 2. Advanced packaging technology is a key enabler to realize complex quantum computing architectures. The project will explore the design of integration scheme based on advanced packaging technologies to produce a variety of cryogenic qubit packaging structures, enabling the integration of more chips with greater functionality, higher I/O counts, and smaller pad pitches, while reducing the circuit footprint.	NUS/NTU/SUTD	
20	System in Package (SIP)	Lim Teck Guan	limtg@ime.a-star.edu.sg	Senior Scientist I	1. 5G mmWave FOWL Antenna-in-Package 2. Heterogeneous Integration on Si/SiC interposer 3. Electronic Photonic Heterogeneous Integration	1) to develop multi-band antenna in package for 5G and mmWave application 2) to develop heterogeneous integration platform for various high power RF applications (Radar & communication including 5G) 3) to develop high-speed photonics and electronic integration platform using Si interposer and FOWLP	NUS/NTU/SUTD	
21	Integrated Circuit Design (ICD)	Chai Tshun Chuan Kevin	chaitc@ime.a-star.edu.sg		1. High performance FFT accelerator through ultrasonic wave 2. Prototype development on FPGA on Nano-Spatial Light Modulator for holographic display.		NUS/NTU/SUTD	

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22	Integrated Circuit Design (ICD)	Gao Yuan	gaoy@ime.a-star.edu.sg			<ul style="list-style-type: none"> 1. MEMS sensor interface circuit 2. Wearable device for vital sign monitoring 3. Bioelectronics platform for emerging therapies 	NUS/NTU/SUTD	
23	Integrated Circuit Design (ICD)	Do Anh Tuan	doat@ime.a-star.edu.sg			<ul style="list-style-type: none"> 1. Hardware-Software codesign for Deep Learning NN implementation 2. Platform development for fast deployment of Neuromorphic Computing hardware 	NUS/NTU/SUTD	
24	RF/mmwave Circuit Design (RF/mmwave)	Raja Muthusamy Kumarasamy	raja@ime.a-star.edu.sg			<ul style="list-style-type: none"> 1. mmwave phased array - component to sub system level. 2. Compact and Low Power Electronics" with wireless powering 3. Cryogenic electronics design for quantum computing 4. Metamaterial based RF sensitivity enhancement 	NUS/NTU/SUTD	
25	Integrated Circuit Design (ICD)	Ravinder Pal Singh	ravinderps@ime.a-star.edu.sg	Scientist		Power electronics/SiC design platform, characterization, and optimization via leveraging ML	Machine-learning framework for platform optimization of power electronics/SiC device design, fabrication, and advanced module packaging with incorporation of SPICE and TCAD simulation data	NUS/SUTD
26	Integrated Circuit Design (ICD)	Ravinder Pal Singh	ravinderps@ime.a-star.edu.sg	Scientist		Power electronics/SiC design platform, characterization, and optimization via leveraging ML	Machine-learning framework for platform optimization of power electronics/SiC device design, fabrication, and advanced module packaging with incorporation of SPICE and TCAD simulation data	NUS/SUTD
27	Integrated Circuit Design (ICD)	Neelakantan Narasimman	neeln@ime.a-star.edu.sg			1. Energy-efficient, High performance sensor Interface design targeted for IoT applications	NUS/NTU/SUTD	

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28	SiC Power Electronics	Yee Ye Sheng	yee_ye_sheng@ime.a-star.edu.sg	Scientist	SiC MOSFET gate dielectric and defects evolution fundamental studies	To study the interface properties of SiC MOSFET gate dielectrics using surface & defect science techniques like XPS, NEXAFS, etc. and devise solutions to reduce density of interface states for higher channel mobility	NUS/SUTD	
29	SiC Power Electronics	Yee Ye Sheng	yee_ye_sheng@ime.a-star.edu.sg	Scientist	SiC MOSFET gate dielectric and defects evolution fundamental studies	To study the interface properties of SiC MOSFET gate dielectrics using surface & defect science techniques like XPS, NEXAFS, etc. and devise solutions to reduce density of interface states for higher channel mobility	NUS/SUTD	
30	SiC Power Electronics	Yee Ye Sheng	yee_ye_sheng@ime.a-star.edu.sg	Scientist	SiC MOSFET gate dielectric and defects evolution fundamental studies	To study the interface properties of SiC MOSFET gate dielectrics using surface & defect science techniques like XPS, NEXAFS, etc. and devise solutions to reduce density of interface states for higher channel mobility	NUS/SUTD	