

Awarded Projects for 2022 MTC IRG Grant Call

S/N	Title of project	Principal Investigator	Grantee
1	Circularly Polarized Ultralong Room Temperature Phosphorescence Based on Amorphous Polymers	Zhao Yanli	NTU
2	An integrated decentralized on-demand on-site hydrogen peroxide production technology	Xu Zhichuan, Jason	NTU
3	Towards human-like autonomy: driver-style-oriented motion control using deep neural networks for personalized	Chen Lyu	NTU
4	Exploring surface phonon polaritons in advanced semiconductors	Wang Qijie	NTU
5	Programmable Additive Filamentation and Layering (FiLa) Manufacturing of Polymorphic Hydrogel Fibers for Soft Ionotronics	Ho Ghim Wei	NUS
6	Sustainable manufacture of valuable chemicals and pharmaceutical compounds through heterogeneous germinal atom catalysis	Lu Jiong	NUS
7	Twisted carbon nanobelts with persistent chiroptical properties for photonics and electronics	Wu Jishan	NUS
8	Strain and orientation engineering of nanopillars for enhanced electromechanical coupling in perovskite oxide thin films	Liu Huajun	IMRE
9	3D printing of lignocellulosic materials via natural deep eutectic solvents	Kai Dan	ISCE ²
10	Reversing natural selectivity to design more efficient synthetic routes – Enzymatic chemoselective secondary alcohol oxidation	Lim Yee Hwee	ISCE ²
11	Economical manufacturing of amino sugars and degradable polymers enabled by catalytic redox cascade	Zhao Yu	NUS
12	On-Chip Electrical Detection of Optical Angular Momentum with Mixed Topological Orders	Dong Zhaogang	IMRE
13	Deep ultraviolet laser fluorescence imaging as a compact microscopy and endoscopy platform for point-of-care clinical insights	Liang Kaicheng	IBB
14	Multielement optomechanical resonators based on chains of silicon nanoantennas for high precision acoustic detection	Ding Lu	IMRE

Awarded Projects for 2022 MTC YIRG Grant Call

S/N	Title of project	Principal Investigator	Grantee
1	Pushing the Limits of Pd-catalysed C–H Functionalisation via Mechanistic Insights from Combined Experimental and Computational Studies For Sustainable Synthesis	Zhang Xinglong	IHPC
2	Cloud-facilitated battery thermal management for connected electric vehicles	Song Ziyou	NUS
3	Physics-informed machine learning modelling and predictive control of nonlinear chemical processes	Wu Zhe	NUS
4	On-surface synthesis of graphene nanoribbons with designer quantum properties for next-generation spintronic applications	Song Shaotang	NUS
5	Solution-processed nanographenes-based triplet–triplet annihilation upconversion materials for optoelectronic applications	Zou Ya	NUS
6	Additive manufacturing of precipitation-strengthened nickel-based superalloys for aerospace applications	Sun Zhongji	IMRE
7	Coaxial wire laser-directed energy deposition of particle-reinforced high-strength aluminum alloy	Tan Chaolin	SIMTech
8	Electrode Design for Chemical Manufacturing from Flue Gas	Tan Ying Chuan	ISCE ²
9	Light–driven cascade radical cyclization catalyzed by vitamin B12 for sustainable access to polycyclic scaffolds	Liu Zhennan	ISCE ²
10	Dehydrogenation of lignin in a CO2 electrolyzer for anode valorization	Wu Tianze	NTU
11	Sustainable, 3D-printable and Reprogrammable Hydroplastics	Koh Junqiang Justin	IMRE
12	Vat Photopolymerization of Hierarchical Porous Complex Thermoelectrics for IoT applications	Zhang Danwei	IMRE
13	Adaptable Lego-like membranes for expansive organic solvent separations	Li Bofan	ISCE ²
14	Bioproduction of High-Value Compounds from Food Waste via Waste Integrated Polymer Extraction and Recovery (WIPER)	Benedict Ryan Lukito	SIFBI
15	Scalable architecture for realising ultrastrong light-matter couplings with superconducting transmon qubits	Huang Ding	IMRE
16	Steep-slope transistors as a platform for fast millimeter-wave and sub-THz detectors	Denis Bandurin	NUS
17	Scalable quantum memories in diamond using defect spins embedded in micrometre-scale beams	Cleaven Chia	IMRE

Awarded Projects for 2021 MTC IRG Grant Call

S/N	Title of project	Principal Investigator	Grantee
1	Wireless Power Transfer: The Next Generation	Shu Yuen Ron Hui	NTU
2	Surface-Clean Cu ₂ O Nanocrystals with Various Morphologies for CO Electroreduction	Zhao Yanli	NTU
3	Origami AlGaIn/GaN optoelectronics for ultraviolet hemispherical electronic eye systems	Kim Munho	NTU
4	All-fibre approach for multi-photon imaging ultrafast laser development	Yoo Seongwoo	NTU
5	Development of more robust and recyclable thermoset polymers	Loh Teck Peng	NTU
6	Phase-Change Optical Nanoantenna Enhanced Single Photon Emitters with Tunability and Chirality	Zhaogang Dong	IMRE
7	Silicon photonic dispersion management systems for error-free transceiver (data center) communication	Dawn Tan	SUTD
8	Fabrication of large size composite structure dysprosium-doped yttria laser ceramics and high-power mid-infrared ceramic laser development	Tang Dingyuan	NTU
9	Untethered Jammable Robotic Structures Driven by Electrochemical Pneumatic Batteries	Wang Yifan	NTU
10	Room-temperature quantum emitters from hexagonal boron nitride	Lu Jiong	NUS
11	Manufacturing radiopharmaceuticals using a selective C-F activation approach	Rowan Young	NUS
12	Additive manufacturing of advanced microtissue-encapsulating device for cellular therapy	Dang Thuy Tram	NTU
13	Development of Sustainable Main-Group Element Catalysts for Industrial Processes	So Cheuk Wai	NTU
14	Revealing Nanoscale Photocatalytic Heterogeneity on 2D and its Composite Materials using Super-Resolution Microscopy	Zhang Zhengyang	NTU
15	3D Printed Functional Bio-Laser System for Multiscale Neural Cell Therapy	Chen Yu-Cheng	NTU

Awarded Projects for 2021 MTC YIRG Grant Call

S/N	Title of project	Principal Investigator	Grantee
1	Pioneering inverse nonlinear metasurfaces for quantum information processing	Xiao XIONG	IHPC
2	Atomically Precise Synthesis of Single-Wall Carbon Nanotube Fragments	Han Yi	NUS
3	Modular bioreactor with nano-needle magneto-transfection technology for end-to-end CAR-T cell manufacturing	Andy Tay Kah Ping	NUS
4	Enhancing Infrared-to-Visible Upconversion by Controlling Exciton Flow in Sensitizer and Annihilator	Wu Mengfei	IMRE
5	ParcelDrone – A Modular, Self-powered Multirotor Approach to Aerial Parcel Delivery	Mir Feroskhan	NTU
6	The Computational Design of Catalysts by Balancing Stability, Efficiency, and Cost-Effectiveness: A Case Study using Fuel Cells	Tej S Choksi	NTU
7	2D Dielectrics for 2D Semiconductors	Lau Chit Siong Aaron	IMRE
8	Freeform Liquid 4D-Printing	Theo Victor Calais	SUTD
9	Improving 3D recognition performance with minimum extra costs for vision guided robotics	Liu Fayao	I2R
10	Direct Laser Writing of Phase-change Semiconductor Microstructures	Lay Chee Leng	IMRE
11	Multi-compositional heterogeneous electrocatalysts for thermoelectric driven hydrogen production	Ice Tee Si Yin	IMRE

Awarded Projects for 2021 AME YIRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Deep-Learning-Based Digital Twin Method for Personalized Optimization and Health Monitoring of Electric Vehicles	Lyu Chen	NTU
2	Dissecting the Role of Interleukin-11 in Marfan Syndrome	Lim Wei Wen	NHCS
3	Three-Phase Plasmonic Catalysis for Solar Powered Transformations of Air into Commodity Chemicals at Ideal Ambient Conditions	Lee Hiang Kwee	NTU
4	Engineering IgM Antibodies Through Multiscale Modelling and Simulations for Cancer Therapeutics and Detection	Firdaus Samsudin	BII
5	Engineering Effective Flavivirus Like Particles – A Novel Vaccination Approach	Jan Marzinek	BII
6	3D Spatial Transcriptomics with Oblique Plane Lightsheet Microscopy, Adaptive Optics, and 3D Image Analysis	Maurice Lee	GIS
7	Tunable Structured Fabrics for Wearable Assistive Applications	Wang Yifan	NTU
8	Design and Manufacturing of Versatile Soft Electronics with Self-healing Materials	Tan Yu Jun	NUS
9	2D/3D Organic Radical Frameworks	Wu Shaofei	NUS
10	Engineering Block Copolymers via Precipitation-Driven Heterocoupling	Wang Chen-Gang	IMRE
11	Humidity-Resistant Reprocessible Elastomeric “Thermosets”	Goh Simin, Shermin	IMRE
12	Deep Model Compression for Time Series Data Analytics via Knowledge Distillation	Chen Zhenghua	I2R
13	Vitrimers from Waste Plastics (V-WASP)	Li Zibiao	IMRE
14	Multifunctional, Edible Microgels for Industrially Scalable Cell-based Fat Production and Modular Integration into Meat Products	Ng Shengyong	IBB
15	Understanding Excitonic Transport towards Dissipationless Electronics	Wu Jing	IMRE
16	Single-molecule Spin Manipulation towards Next-Generation Quantum Device	Su Jie	NUS
17	Inverse-Designed, Mass-Produced On-Chip Router of Photonic Vortex Quantum Bits with Low-Dimensional Nanomaterials	Hu Guangwei	NUS
18	Machine Learning Techniques for Multi-Objective Electromagnetic Optimization	Zeng Yunjia	I2R
19	Metal-Oxo Clusters as Potent Anti-SARS-CoV-2 Coating Precursors on High-Touch Surface with Rapid Killing Kinetics	Li Ning	IBB
20	Designing Swimming Medical Microrobots Based on Machine Learning	Zhu Lailai	NUS
21	A New Data Communication Paradigm for AI-Orientated Visual Analysis	Chen Zhuo	I2R
22	Polariton Light-Emitting Devices for Optical Communication and Quantum Technologies	Ha Son Tung	IMRE
23	Fiberized Quantum Interferometer for Greenhouse Gas Sensing	Anna Paterova	IMRE
24	Spin Polarized Charge Injection and Detection in Transition Metal Dichalcogenides for Valleytronics Application	Calvin Wong	IMRE
25	Battery-Analogue Electrolyzers for Simultaneous Upstream CO2 Reduction to Feed Stocks and Downstream Upgrading to High-Value Chemicals	Leow Wan Ru	IMRE

Awarded Projects for 2020 AME IRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Engineering Single-Atom Catalysts for Wastewater Treatment via Fenton-like Reaction	Liu Bin	NTU
2	Near Infrared Hybrid Systems for Deep Tissue Photoacoustic Imaging	Zhao Yanli	NTU
3	Sniffing-SERS Platform That Recognizes Disease-Related Breath Volatile Organic Compounds	Ling Xing Yi	NTU
4	Heavy Metal-free Sulfur Nano Dots for Luminescence based Applications	Sun Handong	NTU
5	Mid-Far IR Photodetectors by Synthetic 2D Structures	Teng Jinghua	IMRE
6	Exosome Laser Biochip: Nanolasers for Multiplexed Cancer Analysis	Chen Yu-Cheng	NTU
7	Niobium-based Lead-free Piezoelectric Materials with Mobile Lattice Defects and Outstanding Electromechanical Coupling Effects	Yao Kui	IMRE
8	A Simple and Scalable Synthesis of Homogenous N-Glycopeptide and N-Glycoprotein Drugs	Liu Xewei	NTU
9	High-Stability Perovskite Nanocrystals for MicroLED and Electroluminescent Displays	Tan Zhi Kuang	NUS
10	Solution-processed Nanographene Based Distributed Feedback Lasers	Wu Jishan	NUS
11	Engineering of Gut Bacteria Exosome Vesicles for Diet-guided Gastrointestinal Theranostics	Xing Bengang	NTU
12	Simulation-assisted additive manufacturing of gradient high entropy alloys	Yan Wentao	NUS
13	Machine Learning-Based Membrane Development for Solvent Recovery	Jiang Jianwen	NUS
14	Nanoscale Plasmonic Thermoelectric Devices	Joel Yang	SUTD
15	Developing flexible synapse network towards future brain-inspired wearable applications	Wang Xiao	NTU
16	Mass-producible mid-IR metasurfaces for wide-field super-resolution hyperspectral imaging	Luo Yu	NTU
17	Development of Advanced Polymeric Carbon Nitrides as Heterogeneous Photocatalysts for Clean and Sustainable Fine Chemical Manufacturing	Wu Jie	NUS
18	Copper-Catalyzed Asymmetric Aminomethylation of Unsaturated Hydrocarbons to Access Chiral β -Stereogenic Amines	Ge Shaozhong	NUS

Awarded Projects for 2020 AME YIRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Fast-Adapted Neural Networks for Advanced AI Systems	Sun Qianru	SMU
2	Novel sound-absorbing metallic foams with heterogeneous structure via template replication processing	Zhai Wei	NUS
3	Development of an adaptive hybrid particle-continuum molecular mechanics simulation approach for polyelectrolytes in solution	Zhuang Bilin	NUS
4	Atomically precise graphene quantum dots for single photon quantum emission	Mykola Telychko	NUS

Awarded Projects for 2019 AME IRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Development of high-throughput membrane technology for the purification of chiral active pharmaceutical ingredients	Chew Jia Wei	NTU
2	High-Throughput Screening of Perovskites for Catalysis by Mechanochemistry and Machine Learning	Soo Han Sen	NTU
3	Artificial Low-Dimensional Germanium Nanolaser Enabled by On-Demand Quantum Strain Engineering	Nam Donguk	NTU
4	2D Photonsieve for DUV Lithography	Teng Jinghua	IMRE
5	Beyond Boltzmann Switching in Ferroelectric FET for Energy-Efficient Computing	Ang Kah Wee	NUS
6	All-aberration-corrected ultrathin lensing system mass-produced by wafer-level photolithography	Qiu Cheng-Wei	NUS
7	Manufacturing of sustainable thermoreversible anisotropic nanocomposite gel (STANG)	Ho Ghim Wei	NUS
8	Photoexcited hot carriers for van der Waals heterostructures	Ricky Ang	SUTD
9	Divergent Synthesis of Enol Ethers and Enolates from Non-Carbonyl Feedstock	Naohiko Yoshikai	NTU
10	Negative capacitance transistor for flexible and wearable electronics	Liu Zheng	NTU
11	Chemistry-Independent, Fluid-Instability-Mediated and Scalable In-Fiber Manufacturing of Multi-Material Structured Particles	Wei Lei	NTU
12	Towards efficient spin-to-charge conversion based on room-temperature-processed oxide interfaces	Ariando	NUS
13	A Universal Approach to Manufacturing Proteins In Vitro	Chester Lee Drum	NUS
14	Big-Data and Quantum Chemical Calculations Aided Design and Manufacturing of Organic Fluorophores for Wash-Free Bioimaging	Liu Xiaogang	SUTD

Awarded Projects for 2019 AME YIRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Developing an integrated bioprocess for microbial production of natural products	Zhang Congqiang, Simon	SIBFI
2	Smart Cellular Laser Array: Towards High-throughput 3D-Phenotyping and Drug Screening	Chen Yu-Cheng	NTU
3	Development of wafer scale abrupt semiconductor hetero-junctions with defect-free interfaces for next generation electronic and photonic applications	Kim Munho	NTU
4	Spectrally-resolved super-resolution microscopy to probe reactivity patterns and catalytic dynamics on single nanocatalysts	Zhang Zhengyang	NTU

Awarded Projects for 2018 AME IRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Large-scale and Low-cost Synthesis of Graphene Quantum Dots from Small Polyaromatic Molecules and Applications Thereof	Chen Peng	NTU
2	Magnetic-field assisted one-pot synthesis of Nickle-based nanowire arrays and membranes for high performance electro-catalysts	Fan Hongjin	NTU
3	Mechanical-Electric Power Conversion Based on Chemical Potential Difference	Zhang Qing	NTU
4	Intelligent Photonic Tunable Nanophosphors: Recomposition and Storage of Sunlight for Enhanced Photosynthesis	Xing Bengang	NTU
5	Hybrid Electrolysis for Biomass Refinery and Hydrogen Generation	Li Hong	NTU
6	Hybrid Acoustic Metamaterials for Sustainable Noise Control and Super-resolution Imaging	Fan Zheng	NTU
7	Advanced Manufacturing of wearable microneedle skin patch platforms with 3D printing for transdermal drug delivery	Song Juha	NTU
8	Atomic Layer Deposition of High-Entropy Alloy 2D and 3D Coatings for Multifunctional Applications	Alfred Tok	NTU
9	Waste refrigerants for the generation of fluoroploymers	Rowan Young	NUS
10	Tailoring Magnetic Order at Nonmagnetic Metal-Ferroelectric Interfaces for Low Switching Energy Devices	Ariando	NUS
11	Scalable Growth of Ultrathin Ferroelectric Materials for Memory Technologies	Loh Kian Ping	NUS
12	Spin-orbit torque enhancement with multiferroics for low power magnetic memory	Chen Jingsheng	NUS
13	Next generation ultra-broadband THz spectrometers	Yang Hyunsoo	NUS
14	Photon Upconversion Amplification through Dielectric Microlensing for Improved Photovoltaics	Xiaogang Liu	NUS
15	3D Printing by Continuous Phase Inversion	Michinao Hashimoto	SUTD

Awarded Projects for 2018 AME YIRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Tailor-designed synthetic pathway with engineered biocatalysts for biomanufacturing natural ingredient	Chen Xixian	BioTrans
2	Additive Manufacturing for the Fabrication of Immunomodulatory Interface Layers for Medical Implants	Cyrus Beh	MEL
3	Microbial surveillance of "plant factories" in Singapore and the associated mechanisms of human pathogen occurrence on leafy green vegetables	Li Dan	NUS
4	Enabling nanophotonic X-ray free electron lasers based on novel electron-polariton physics	Wong Liang Jie	SIMTech

Awarded Projects for 2017 AME IRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	MICROPROCESSOR-BASED METHODS OF COMPOSITE CURING	Terry Steele	NTU
2	High-Gain Nanostructured Photonic Composites for On-Chip Waveguide Amplifiers	Tan Mei Chee	SUTD
3	Hybrid and Cold Laser Manufacturing of Functional Micro/nanostructures on High-hardness Transparent Substrates	Hong Minghui	NUS
4	Uncooled two-dimensional focal plane array mid-wave infrared imaging system	Zhang Dao-Hua	NTU
5	Development of High Efficiency Ytterbium Doped Sesquioxide Laser Ceramics and High Power Ultrafast Ceramic Lasers	Tang Dingyuan	NTU
6	Air-Stable Perovskite Quantum Dots: New Synthesis and Wavelength-Tuneable Lasing	Fan Hongjin	NTU
7	Self-Assembled Organic Nanoparticles for Efficient Three-Photon Imaging	Zhao Yanli	NTU
8	Development of a New Family of Electron Acceptor Materials Based on the Buckybowl Motif	Mihaiela Stuparu	NTU
9	Flexible Scintillators for X-Ray Metrology in Advanced Manufacturing	Liu Xiaogang	NUS
10	Soft Modular Adaptive Gripper Capable of Fast Response and Large Force	Zhu Jian	NUS
11	Development of cutting-edge DNA Nanogels for Pharmaceutical and Medical Applications	Li Tianhu	NTU
12	Towards Robotic Dexterous and Bimanual Manipulation in Micro-world	Cheah Chien Chern	NTU
13	3D Printing of Transparent Ceramics by Stereolithography Method Assisted with Hot Isostatic Press Process	Gan Chee Lip	NTU
14	3D-Printed Conductive Polymeric Scaffolds and Cell-Laden Hydrogel Constructs for Neuronal Tissue Regeneration	Lu Wen Feng	NUS
15	DEVELOPMENT OF E-BAND GAN-ON-SI TRANSISTORS	Liu Zhihong	SMART

Awarded Projects for 2017 AME YIRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Ultra-stretchable Graphene-Based Molecular Barriers for Smart Protective Clothing	Chen Po-Yen	NUS
2	Line-scan spectral domain Optical Coherence Tomography at 1.7 μm for ultrahigh speed and resolution in-line coating assessments of pharmaceutical tablets	Chong Shau Poh	NUS
3	Predicting Structure-Property Relationships of High-Entropy Materials via Machine Learning Techniques	Tan Teck Leong	IHPC
4	Enabling Non-Equilibrium Phonon Control at The Nanoscale	Ding Ding	SIMTech
5	ELIMINATE STATIC: NON-CHARGING MATERIALS FOR POWDER PROCESSING & PAT	Wong Shin Yee	SIT
6	Development of a Novel Bioink with 3D Pore-Lattice Microstructures using Microfluidic DrOpleTs (MicroDOTs Bioinks)	Christopher Tostado	NUS

Awarded Projects for 2016 AME IRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Synthesis of Metal and Odor-Free Capsules for Personal Care Applications via Iodide-Mediated Controlled Radical Polymerization	Atsushi Goto	NTU
2	C-C Bond Activation with Photoredox Vanadium Catalysts under Batch and Flow Conditions Towards Advanced Fine Chemicals and Pharmaceutical Manufacturing	Han Sen Soo	NTU
3	MECHANOCHEMICAL APPROACHES TO MAIN GROUP SOLID-STATE PHOTOREDOX SYSTEMS	Felipe Garcia	NTU
4	Through Substrate Via with Embedded Capacitor for 3D Packaging	Tan Chuan Seng	NTU
5	Advanced Autonomous Functional Nanorobots	Richard Webster	NTU
6	Controllable Wetting and Drying of a Sessile Droplet of Solutions and Suspensions	Duan Fei	NTU
7	Novel Porous Materials for High-Efficient CO ₂ Capture and Catalytic Conversion	Zhao Yanli	NTU
8	Carbene-Catalyzed Selective Protection and Functionalization of Saccharides	Chi Yonggui Robin	NTU
9	Preparation of Renewable Composite Filters for Simultaneous Removal of NO _x and Soot Particulate from Marine Diesel Exhaust	Zhang Hua	NTU
10	A New Generation of Hydrogenation Catalysts for Manufacturing of Chiral Drugs: Nickel Catalysts with 10,000 Turnovers	Chi Yonggui Robin	NTU
11	Physic and Scaling laws of electric contact using 2D materials	Ricky ANG	SUTD
12	Contouring-fitting, high thermal conductivity and light weight hybrid fabrics for hypothermia treatment through a hybrid manufacturing process	He Wei	SIMTech
13	Solid-Phase-Based Continuous-Flow Synthesis to Enable On-Demand Active Pharmaceutical Ingredient Manufacturing	Wu Jie	NUS
14	Bioproduction of high-value chemicals from renewable feedstock	Li Zhi	NUS
15	Scaled-Up Production of Valuable Metal-Organic Frameworks	Zhao Dan	NUS
16	Advanced Catalytic Membrane Reactor to Co-produce Propylene & Methane from Propane & CO ₂	Sibudjing Kawi	NUS

Awarded Projects for 2016 AME YIRG Grant Call

S/N	Title of Project	Principal Investigator	Grantee
1	Controlling reactivity through solvents in carboxylic acid hydrogenation	Chia Mei	ICES
2	Hierarchical assembly of colloidal super crystals	Ni Ran	NTU
3	Self-healable semiconductors for next generation wearable sensors	Leong Wei Lin	NTU
4	Plasma based novel radiation sources	Ding Wenjun	IHPC
5	Predicting crystalline interfacial structures in a complex oxide using a genetic algorithm	Cheah Wei Li	IHPC