

## Singapore Science & Engineering Fair 2019 Awards

GOLD AWARDS		
S/N	Project Code	Project Title
1	BE014	Novel smart-material based support system to alleviate pressure ulcer formation in bed-ridden patients
2	CB013	The Tumour Suppressor Fumarase promotes DNA Repair by succinylating the Linker Histone H1
3	CH012	A Novel Approach for the Design of Supports of Nickel-Based Catalysts Adopted In CO <sub>2</sub>
4	CH013	Bioconversion of Greek Yoghurt Whey into Functional Beverage via Fermentation
5	CH026	Vibrational spectroscopy with optimal filtration for ultrasensitive molecular detection: a computational study
6	CH033	Impact of Microplastics in Marine Animals
7	CO018	Simulating growth interaction among trees according to the L-System
8	EA002	Synthesis of Photocatalytic Bismuth Vanadate (V) for Degradation of Organic Dyes
9	EA006	Synthesis of Eco-friendly and Reusable Bone Char Composite Beads for Metal Ions and Fluoride Removal
10	EE020	To investigate whether lactic acid from probiotic fermentation of fruit waste can be used as a solvent to dissolve chitosan for making biodegradable plastic
11	EM022	Origami Paper Parachutes
12	MA032	Regular Matchstick Graphs
13	MI016	Nature Inspired Bactericidal Nanotextured Surfaces with ZnO Needle Structures
14	MS025	Low-Cost Nanostructured Membrane for Separating Different Types of Oil-Water Emulsions
15	MS027	Fabrication of Graphene-Derived Metal Origami via Ion Intercalation Templating
16	MS028	Electrifying Properties of Scintillating Zinc Oxide Ensnconced in a Carbon Nanoforest
17	MS037	Effectiveness of Detergents Analysed using Rotating Magnetic Nanoparticles
18	MS068	Nano-glued Activated Carbon Electrodes for High Performance Capacitive Deionisation to purify water
19	PH001	Characterisation of Atmospheric Changes of Earth due to Industrial Activities for Extrasolar Detection of Intelligent Life on Earth
20	PH005	Investigation of bubble formation from circular soap films by impinging air jets
21	PH006	Dynamic Trajectory and Parametric Resonance in Coupled Pendulum-Beam Oscillator
22	RO029	Data Analytics for Fake News Detection
23	RO034	MAGNet: Mobile Acne-severity Grading with Residual Convolutional Network
24	TM001	Characterization of PRL-3 Oncogenic Phosphatase in its role in mediating acquired resistance to Bortezomib in Multiple Myeloma
25	TM002	Single-tube screen for rapid identification of several autosomal dominant cerebellar ataxias with overlapping clinical phenotype
26	TM006	The role of group II PAKs in cancer and the development of small molecular peptide kinase inhibitors as therapeutic drugs

## Singapore Science & Engineering Fair 2019 Awards

SILVER AWARDS		
S/N	Project Code	Project Title
1	BI005	Investigation of the micro-structure and the stability of protein nano-cage stabilised colloidal system
2	BI018	An investigation on the interactions between G-quadruplex DNA and ruthenium arene complexes with curcumin analogues
3	BI022	Investigating the effect of DNA extraction methodologies on variations in Relative Telomere Length measurements for psychosocial, behavioural and ageing studies
4	BM001	Tryptophan-Kynurenine Dysregulation in Bladder Cancer: Opportunity for the Development of a Predictive Model for Management in the Primary Healthcare Sector
5	CB019	The Role of Aurora A kinase in regulating spindle pulling force
6	CH028	Green Synthesis of Bisphenol-A and Potassium Aluminium Sulfate from Waste Compact Discs
7	CH038	Synthesis of Porous Calcium Alginate Beads Embedded with Eco-friendly Reduced Graphene Oxide Synthesized from Durian Waste for Water Purification
8	CH066	Real-Time Monitoring of Formation of Polydopamine Layers
9	CO016	Effects of Light on Plant Hormones and Growth: An L-System and Cellular Automata-Based Definition
10	EA009	Synthesis of Magnetised Activated Carbon from Pistachio Shells for Removal of Atrazine from water
11	EA010	Comparing Activated Carbon and Biochar Made From Sugarcane Bagasse
12	EA011	Synthesis and Evaluation of Chloride Intercalated Layered Double Hydroxides (LDHs) for Removal of Phosphate from Water Bodies
13	EA017	Characterisation of Spent Mushroom Compost Biochar in Removing Heavy Metal Ions from Water
14	EC003	Effect of the type of metal hydroxide used as a precipitating agent on the electrochemical properties of MgCo <sub>2</sub> O <sub>4</sub> as an anode material
15	EC018	AMn <sub>2</sub> O <sub>4</sub> (Co, Mn, Fe, Ni) as an Anode Material for Lithium Ion Batteries
16	EE014	Synthesis of Superabsorbent Cellulose-based Hydrogels from Food Waste
17	EE025	Novel regeneration process for adsorbent used in wastewater treatment
18	MA039	Factorization of Weak RSA Keys
19	MS045	Molecular multi-layers studied by precision ellipsometry
20	PS004	Investigating the Effects of Heat Stress on the Molecular Pathways of Root Development
21	SS008	Generative Grammar-based Fuzzing.

## Singapore Science & Engineering Fair 2019 Awards

BRONZE AWARDS		
S/N	Project Code	Project Title
1	AS001	The Effect of Particulate Organic Matter (POM) on Coral Trophic Dynamics
2	BE004	A highly sensitive and specific aptamer-based ELISA assay for clinical applications
3	BM007	Investigating the effect of lactic acid bacteria on the prevention of Alzheimer's disease
4	BM010	A study on cryopreservation of cell-laden hydrogels
5	CB003	The effectiveness of natural products (Coconut oil, Raspberry Seed oil and Shea butter) in their UV protecting ability
6	CB010	Investigation of SiglecE's Role in SLE Pathogenesis
7	CB012	The Role of RNA Polymerase II in DNA Repair
8	CB020	Identification of circuits that underlie tremor
9	CH001	Thermoelectric composites derived from CuI-based coordination polymers
10	CH030	Optimizing Temperature and Molten Salts for Synthesis of Tin(IV) Oxide as Anode Material for Lithium Ion Batteries
11	EC013	High temperature fluorinated silica membrane to convert heat to energy
12	EE001	Investigating the effects of isolated cyanophages on Microcystis and Cylandrospermopsis strains
13	EE019	Potential bioremediation of arsenic-contaminated water through application of bioengineered bacteria
14	EE024	Light activated, protected TiO <sub>2</sub> coating for degrading malodor
15	EM004	3D-printing of curved panpipes
16	EM014	Scan Performance Comparison of Prime-focus, Bifocal and Quadrefocal Reflectarray Antennas
17	EM020	Origami-inspired Satellite Dish
18	EM036	Automation of Precision Ellipsometry System
19	ES039	Compact Electromagnetic Pulse (EMP) Jammer to Disable and Disrupt Electronics
20	MA031	Chromatic number of graphs
21	MI007	Antifungal susceptibility of Malassezia against over-the-counter topical antifungals in Singapore
22	MI017	Targeting Potential Drug Pockets on Biomarker for Combating Multidrug Resistant Klebsiella Pneumoniae
23	MS021	Magnetism in Two Dimensional Arrays
24	MS039	Effect of inorganic nanoparticles in glass transition temperature of environmentally friendly polymer composites: Green technology to produce SOC free paint
25	MS065	Anti-Infrared Panels to save energy and achieve urban sustainability in smart cities
26	MS066	Too sweet for bacteria: bacteria-resisting sugar-coated surfaces
27	RO026	Adversarial Attacks & Defences with Implicit Generative Models by exploiting Latent Manifolds
28	SS003	The optimisation of taxi services in Singapore through data analysis

## Singapore Science & Engineering Fair 2019 Awards

<b>BRONZE AWARDS</b>		
<b>S/N</b>	<b>Project Code</b>	<b>Project Title</b>
29	SS015	Vision Field Testing using a Virtual Reality Enabled Platform
30	SS038	Keying in on Digital Signature Algorithm Schemes
31	SS039	Machine Learning for Modbus Intrusion Detection System

## Singapore Science & Engineering Fair 2019 Awards

MERIT AWARDS		
S/N	Project Code	Project Title
1	BE018	A Signal Processing Approach to the Detection of Obstructive Sleep Apnea
2	BE023	Modulation of inflammatory processes using synthetic GAG mimetics with tunable artificial sulfation patterns
3	BI027	Expression and characterisation of Fasxiator, a novel anticoagulant
4	BI031	Investigating the effect of proteins in bovine milk, specifically whey protein and casein, on the total phenolic content of polyphenol extracts from unprocessed cocoa powder and heavily alkalized cocoa powder.
5	BM003	Role of Long Non-coding RNAs in Hepatocellular Carcinoma
6	BM004	EASY MHC-I- A Rapid Peptide Antigen Assay
7	CB005	A genetic odyssey: investigating causative mutations in Spinal Muscular Atrophy patients without homozygous SMN1 deletions
8	CH065	Geometry of water: an analysis with Euclidean Voronoi diagrams
9	CO001	Analysing Frontal EEG Corelates of Short Term Working Memory Stages of Idle, Encoding and Recalling
10	CO014	Cyanobacteria with natural "transition glasses".
11	CO020	Genome Wide Association Study on Human Genetic Determinants of Tamoxifen Metabolism
12	EA008	Green synthesis of silver nanoparticles and its potential in organophosphate removal
13	EA016	The Riceland Prawn ( <i>Macrobrachium Lanchesteri</i> ) as a bioindicator of water pollution
14	EE006	Electricity generation from wastewater purification
15	EE015	Development of a portable microbial detection system that fluoresce in the presence of copper(II) ions in water
16	EM011	Mitigating Phone Radiation During Calls
17	EM018	Investigation and Optimisation of Aerodynamic Performance of Biomimetic Gliders for Future Transportation
18	EP003	Optimization of Efficiency of Organic Solar Cells
19	MA002	Computations of Slowly Convergent Series
20	MA014	Approximating Dataset Complexity based on Learning Curves
21	MA025	Analysing Plane Curves by Support Functions
22	MA030	Smoothing Operations on Cycle Graphs
23	MA034	Whispers in the financial market
24	MI006	Investigating the antibacterial and cytotoxic effects of lichen extracts
25	MI011	Screening for environmental bacteriophages for therapeutic and diagnostic purposes
26	MI015	Searching for Viral Signatures in Metagenomic data with Hidden Markov Models
27	MS003	Investigating the Photo-Current Response in Carbon-Incorporated ZnO Nanowires
28	MS013	Mild Solvothermal Synthesis and Characterisation of Cu <sub>2</sub> -xS for Thermoelectrics

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MERIT AWARDS		
S/N	Project Code	Project Title
29	MS026	Lipophilic gel in controlled release of oil/fragrance in personal and consumer care products
30	MS035	Temperature Dependent Schottky Diode Parameters Evaluation in GaN HEMT on Diamond
31	MS040	Direct patterning of Bismuth Sulfide on a sub-10nm scale using Electron Beam Lithography.
32	MS055	Temperature Dependent Electrical Performance of GaN High Electron Mobility Transistors by Numerical Analysis
33	MS064	Reconstructing Phonon Density of States from Temperature-Dependent Measurements: Solving Ill-Posed Integral Equations
34	PH012	Optimised Gaussian Cannon
35	PH021	Photomagnetic effect in lanthanum doped niobate
36	RO019	iStylish: Versatile Fashion and Dressing Styles Recommender using Latent Class Analysis
37	TM005	Formulation of Dry Powder Microparticles for the Pulmonary Administration of Levodopa
38	TM007	Cancer treatment via photothermal heat generation by metalodielectric nanostructures
39	TM011	Development and Screening of effective monoclonal antibody for FGFR1 as targeted cancer therapy

## Singapore Science & Engineering Fair 2019 Awards

SSEF SPECIAL AWARDS			
Organisation	Category	Project Code	Project Title
Institution of Chemical Engineers (IChemE) Singapore	JC	EC012	Numerical analysis of enhancement in helical-tube Latent Heat Thermal Energy Storage system for building applications
Institution of Chemical Engineers (IChemE) Singapore	JC	EC013	High temperature fluorinated silica membrane to convert heat to energy
Institution of Chemical Engineers (IChemE) Singapore	Sec	EC005	Effect of Fruit Peels on Plant Microbial Fuel Cell
Institution of Chemical Engineers (IChemE) Singapore	Sec	EC009	Generation of Electricity using Microbial Fuel Cells and Rotten Lemons
SUTD Sharp Awards	Aviation	EM018	Investigation and Optimisation of Aerodynamic Performance of Biomimetic Gliders for Future Transportation
SUTD Sharp Awards	Aviation	MS017	Transparent, Stretchable and Self-healing Conductor
SUTD Sharp Awards	Cities	EE020	To investigate whether lactic acid from probiotic fermentation of fruit waste can be used as a solvent to dissolve chitosan for making biodegradable plastic
SUTD Sharp Awards	Cities	EE024	Light activated, protected TiO <sub>2</sub> coating for degrading malodor
SUTD Sharp Awards	General	BE007	A Portable High-Accuracy ECG-Assisted Blood Pressure Monitor for Smartphones
SUTD Sharp Awards	General	BE009	Optimization of Nanoantennas for Enhanced Photothermal Heat Generation
SUTD Sharp Awards	AI	RO004	Detecting the Sentiments of Youtube Videos
SUTD Sharp Awards	AI	RO026	Adversarial Attacks & Defences with Implicit Generative Models by exploiting Latent Manifolds
SUTD Sharp Awards	Healthcare	BE003	Validation of Cardiac Segmentations using automated software
SUTD Sharp Awards	Healthcare	RO024	Smart Surgical Tools Checker
Singapore Society for Microbiology and Biotechnology (SSMB)		MI017	Targeting Potential Drug Pockets on Biomarker for Combating Multidrug Resistant Klebsiella Pneumoniae
Electrochemical Society, Singapore Chapter		EC005	Effect of Fruit Peels on Plant Microbial Fuel Cell
Electrochemical Society, Singapore Chapter		EC013	High temperature fluorinated silica membrane to convert heat to energy
Electrochemical Society, Singapore Chapter		EC018	AMn <sub>2</sub> O <sub>4</sub> (Co, Mn, Fe, Ni) as an Anode Material for Lithium Ion Batteries

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<b>SSEF SPECIAL AWARDS</b>			
<b>Organisation</b>	<b>Category</b>	<b>Project Code</b>	<b>Project Title</b>
Yale-NUS		AS005	Investigating the role of Magnetite as a sedative in <i>Drosophila melanogaster</i>
Yale-NUS		BI002	Investigating how the concentration of casein affects the availability of free polyphenols in black tea at various temperatures
Yale-NUS		CH028	Green Synthesis of Bisphenol-A and Potassium Aluminium Sulfate from Waste Compact Discs
Yale-NUS		PH022	Investigation on effect of temperature change on lifetime of bubbles
Yale-NUS		MA003	Diameter-d Regular Graphs and its Applications on Tournaments
Yale-NUS		MA014	Approximating Dataset Complexity based on Learning Curves
Yale-NUS		EP004	Designing an Efficient Solar-Powered Greenhouse Using Biomimicry
Yale-NUS		ES020	Navi-Assist
Yale-NUS		BI013	Comparative study of hair cuticles under shampoo with fruit enzymes of different pH
Singapore Association for the Advancement of Science (SAAS)		CH033	Impact of Microplastics in Marine Animals
Singapore Association for the Advancement of Science (SAAS)		ES033	WiFind Me: Indoor Localisation With WiFi
Singapore Association for the Advancement of Science (SAAS)		CB013	The Tumour Suppressor Fumarase promotes DNA Repair by succinylating the Linker Histone H1
Singapore Association for the Advancement of Science (SAAS)		EP004	Designing an Efficient Solar-Powered Greenhouse Using Biomimicry
Singapore Association for the Advancement of Science (SAAS)		EM018	Investigation and Optimisation of Aerodynamic Performance of Biomimetic Gliders for Future Transportation
Singapore Association for the Advancement of Science (SAAS)		EE008	Determining the Plastic Degradation Efficiency of <i>Tenebrio Molitor</i> and <i>Zophobas Morio</i>
Singapore Association for the Advancement of Science (SAAS)		MS066	Too sweet for bacteria: bacteria-resisting sugar-coated surfaces



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<b>SSEF SPECIAL AWARDS</b>			
<b>Organisation</b>	<b>Category</b>	<b>Project Code</b>	<b>Project Title</b>
Singapore Association for the Advancement of Science (SAAS)		PH014	Optical Vortex Beams for Improved Data Encryption Through Manipulation of Topological Charge
Singapore Association for the Advancement of Science (SAAS)		MI016	Nature Inspired Bactericidal Nanotextured Surfaces with ZnO Needle Structures
Singapore Association for the Advancement of Science (SAAS)		MS036	Noise Isolating Properties Of Earplugs

## Singapore Science & Engineering Fair 2019 Awards

Intel ISEF 2019 Delegates			
Project Code	Delegate Name	Type Of Project	Project Title
MS027	Clive Choong	Team	Graphene-Enabled Templating Synthesis of Metal Origami for Next-Generation Soft Robotics
	Harish Kumar S/O Tamil Selvan		
	Yap Yi Tern, Elden		
EM022	Natalie Elizabeth Yam	Individual	Origami Paper Parachutes
MI016	Tan Yee Lin	Individual	Nature Inspired Bactericidal Nanotextured Surfaces with ZnO Needle Structures
MS028	Kwek Zhong Wei, Isaac	Team	Electrifying Properties of Scintillating Zinc Oxide Ensnared in a Carbon Nanoforest
	Tan Yi Jie, Valerie		
MS037	Jovan Yap Zheng Feng	Individual	Effectiveness of Detergents Analysed using Rotating Magnetic Nanoparticles
RO029	Liu Haohui	Individual	Data Analytics for Fake News Detection

## Singapore Science & Engineering Fair 2019 Awards

<b>JUNIOR SCIENTIST VIDEO CONTEST</b>		
<b>S/N</b>	<b>Project Code</b>	<b>Project Title</b>
1	JPH001	Development of a UV delivery system for the growth of anemone
2	JPH002	PeITile Watch
3	JB1001	Investigation on the Effectiveness of Different Plant-based Filters for Filtration of Escherichia coli and Chloride Ions in Wastewater

<b>JUNIOR SCIENTIST AWARDS</b>		
<b>S/N</b>	<b>Project Code</b>	<b>Project Title</b>
1	JCH005	Eco-friendly Synthesis of Cerium Oxide Nanoparticles for UV Protection
2	JCH009	Effect of the Percentage of Agarose and Percentage of Sodium Chloride on the Performance of Dye Sensitised Solar Cells.
3	JCH002	Investigating the Effectiveness of Acids on Rouge Removal