

# INSPO RESEARCH AND INNOVATION COMPETITION 2020

## FULL AWARDEES LIST

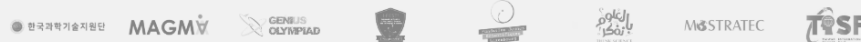
**INSPO** SCIENCE  
C A N A D A

*GENEROUSLY SUPPORTED BY*

### SPONSORING AFFILIATIONS



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### SUPPORTING ORGANIZATIONS



## TABLE OF CONTENTS

<b><i>JUNIOR AWARDS</i></b> .....	<b>3-8</b>
<b>JUNIOR INSPO MERIT AWARDS</b> .....	<b>3-7</b>
BRONZE MEDALISTS.....	3-5
SILVER MEDALISTS.....	5-6
GOLD MEDALISTS.....	6-7
<b>JUNIOR INSPO CATEGORY AWARDS</b> .....	<b>7-8</b>
<b>JUNIOR INSPO PRIME AWARD</b> .....	<b>8</b>
 <b><i>SENIOR AWARDS</i></b> .....	 <b>8-17</b>
<b>SENIOR INSPO MERIT AWARDS</b> .....	<b>8-16</b>
HONOURABLE MENTION.....	8-11
BRONZE MEDALISTS.....	11-14
SILVER MEDALISTS.....	14-15
GOLD MEDALISTS.....	15-16
<b>SENIOR INSPO CATEGORY AWARDS</b> .....	<b>16-17</b>
<b>SENIOR INSPO PRIME AWARD</b> .....	<b>17</b>
 <b><i>INSPO SPONSORED AWARDS</i></b> .....	 <b>17-22</b>
DROP THE STEM PEOPLE'S CHOICE AWARD.....	17-18
FORUM FOR YOUNG CANADIANS AWARD.....	18
HELYX INITIATIVE BIOINFORMATICS AWARD.....	18
NEW YORK ACADEMY OF SCIENCES AWARD.....	18-19
NOKIA FUTURE TECH INTERNSHIP AWARD.....	19
SCOTIABANK PATENT GRANT.....	19
SHAD CANADA AWARD.....	19-20
SIGMA XI RESEARCH AWARD.....	20
SIMPLY NEUROSCIENCE AWARD.....	20
STEM FELLOWSHIP PUBLICATION AWARD.....	20
THE KNOWLEDGE SOCIETY (TKS) AWARD.....	21
WISEST SRP EXTERNSHIP AWARD.....	21
<b>HONORARY DISTINCTIONS</b> .....	<b>21-23</b>

**ALL FINALISTS ARE ENTITLED TO THE FOLLOWING:**

- A \$10,000 USD SCHOLARSHIP TO THE ROCHESTER INSTITUTE OF TECHNOLOGY (SUPERSEDED IF A MEDAL AWARD IS WON).
- A \$500 USD SCHOLARSHIP TO THE KNOWLEDGE SOCIETY PROGRAM IN ANY CITY, VALID FOR THE 2020-2021 YEAR.

# JUNIOR INSPO MERIT AWARDS

AWARDED TO THE TOP OVERALL PROJECTS

## BRONZE MEDALISTS

- top 30% of all finalists -

\$15,000 USD ENTRANCE SCHOLARSHIPS TO THE ROCHESTER INSTITUTE OF TECHNOLOGY, SHIPPED MEDAL + CERTIFICATE

<i>Student Name(s)</i>	<i>School</i>	<i>Category</i>	<i>Project Title</i>
<i>Aditya Rai and Kaustubh Sonawane</i>	<i>Jasper High School</i>	<i>Technology</i>	<i>LungStat: Improving Early Stage Lung Cancer Diagnostic Accuracy Through an Integrative Deep Learning Algorithm and An Analysis of NSCLC Biomarkers</i>
<i>Aditya Sood</i>	<i>Westview High School</i>	<i>Technology</i>	<i>Utilizing Hardware Physically Unclonable Functions (PUFs) For Enhancing Privacy and Revolutionizing Encryption of Consumer Electronic Health Records (EHRs)</i>
<i>Shreshth Shrivastava</i>	<i>Central Middle School Eden Prairie</i>	<i>Technology</i>	<i>Wi-C.A.R.E (Wifi Computer Assisted Remote Elder Care)</i>
<i>Aryansh Shrivastava</i>	<i>Washington High School</i>	<i>Technology</i>	<i>Biosignal Controlled, Robotic Intelligent Assistive Device for People with Spinal Injuries, Cerebral Palsy, Amputation, And Muscular Dystrophy</i>
<i>Christopher Lamont</i>	<i>Bishop Ryan Catholic Secondary School</i>	<i>Technology</i>	<i>Creation of An Intravenous Fluid Delivery System (IVFDS) For Low- and Middle-Income Countries</i>
<i>Ella Wang</i>	<i>BASIS Chandler</i>	<i>Technology</i>	<i>HemaVision: A Novel Smartphone-Based Imaging System for Automated Detection of Hematological Diseases Utilizing Computer</i>

			<i>Vision And Convolutional Neural Networks</i>
<i>Heng Yang</i>	<i>American High School</i>	<i>Technology</i>	<i>Detection and Control Of A Power Usage Program Using Deep Learning And Ecological Graphene Based Double Layer Capacitors</i>
<i>Keanu Chan</i>	<i>Parkland Middle School</i>	<i>Technology</i>	<i>Design, Implementation and Assessment of HEALIT (Hemostasis by Expanding Automatic Life-Saving Innovative Technique)</i>
<i>Krish Patel and Naman Verma</i>	<i>Thornton Junior High School</i>	<i>Technology</i>	<i>Eyesense: A Headset That Navigates the Blind</i>
<i>Noor Boukari</i>	<i>Caesar Rodney High School</i>	<i>Biology</i>	<i>Implementing Semantic Deep Learning Segmentation to Improve The Accuracy Of Automated Malaria Diagnosis Systems</i>
<i>Quentin Hughes</i>	<i>Minnetonka High School</i>	<i>Biology</i>	<i>An Active Role for Machine Learning In The Diagnosis Of Atrial Fibrillation</i>
<i>Raphael Kelly</i>	<i>Archbishop MacDonald High School</i>	<i>Biology</i>	<i>Assessing Human Impact on Migratory Bird Species Using GIS Software And Statistics</i>
<i>Siddhanth Pachipala</i>	<i>The Academy of Science and Technology</i>	<i>Technology</i>	<i>Prediction of Chronic Stress Through A Computational Linguistic Machine Learning Model</i>
<i>Tienlan Sun</i>	<i>Eric Hamber Secondary</i>	<i>Technology</i>	<i>AEye Doctor: An Automated Diagnosis System For Ophthalmological Diseases</i>
<i>Andy Liang and Alex Sun</i>	<i>Eric Hamber Secondary School, Sir Winston Churchill Secondary</i>	<i>Biology</i>	<i>Treatment of Algal Blooms with Synthesis of Control Agent and Deep Learning Distribution System</i>

*Victor Cai*

*Parkland High School*

*Technology*

*Designing A  
Narrowband Radar  
Using Software Defined  
Radio (SDR) For  
Tomography and Indoor  
Sensing*

**SILVER MEDALISTS**

*- top 15% of all finalists -*

**\$18,000 USD ENTRANCE SCHOLARSHIPS TO THE ROCHESTER INSTITUTE OF TECHNOLOGY, SHIPPED MEDAL + CERTIFICATE**

<i>Student Name(s)</i>	<i>School</i>	<i>Category</i>	<i>Project Title</i>
<i>Andrew Gao</i>	<i>Canyon Crest Academy</i>	<i>Biology</i>	<i>Blood-Based Biomarkers For Non-Invasive Early Detection Of Parkinson's</i>
<i>Anish Goel</i>	<i>Lisgar Collegiate Institute</i>	<i>Biology</i>	<i>Proteomic Analysis Reveals The Dysregulation Of MAPK And Critical Pathway Signaling In Alzheimer's Disease</i>
<i>Siya Goel</i>	<i>West Lafayette Jr/Sr High School</i>	<i>Technology</i>	<i>PanCan Diagnosed: Developing an Algorithm for the Accurate and Affordable Early Diagnosis of Pancreatic Cancer via Machine Learning and Bioinformatics</i>
<i>Caroline Huang</i>	<i>Abbey Park High School</i>	<i>Biology</i>	<i>Computing Neuroregeneration; Simulating Cognitive Function With Physarum AI</i>
<i>Hanzala Subhani</i>	<i>Westminster Secondary School</i>	<i>Biology</i>	<i>IPSC-DCX+ Cells: An Alternative Treatment Option For Neurodegenerative Diseases</i>
<i>Khushi Parikh</i>	<i>Gilbert Classical Academy</i>	<i>Technology</i>	<i>A Deep Convolutional Neural Network To Detect Antibiotic Resistance</i>

<i>Patricia Rea</i>	<i>Markham District High School</i>	<i>Biology</i>	<i>Polymorphisms In S. Pneumoniae DNA</i> <i>BioGrade Yeast: A Novel Approach To Colonising Mars With An Actin-Antifreeze Protein Polymer</i>
<i>Reva Gandhi</i>	<i>Parkland High School</i>	<i>Environment</i>	<i>BioSkin: Saving People And The Planet Through Increasing The Shelf Life Of Produce</i>
<i>Riju Dey</i>	<i>Shorewood High School</i>	<i>Biology</i>	<i>Discovery Of Novel Dual Phosphatase Kinase In Pseudomonas Aeruginosa Contributing To Pathogenicity</i>
<i>Runqian Wang</i>	<i>Princeton International School of Mathematics and Science</i>	<i>Technology</i>	<i>Adaptive Computation Of The Projection Matrix For Medical Imaging</i>
<i>Vansh Sethi</i>	<i>Colonel By Secondary School</i>	<i>Technology</i>	<i>Predicting Chimeric Antigen Receptor T-Cell Specificity Given The Epitope Sequence Of An Antigen Using Sequence2Sequence Learning And Classification</i>
<i>Sowmya Chundi</i>	<i>Carmel High School</i>	<i>Biology</i>	<i>Designing A Tumor-Specific Oncolytic Virus To Induce Suicide Gene Expression In Glioblastoma Cancer</i>

## **GOLD MEDALISTS**

*- top 5% of all finalists -*

\$20,000 USD ENTRANCE SCHOLARSHIPS TO THE ROCHESTER INSTITUTE OF TECHNOLOGY, SHIPPED MEDAL + CERTIFICATE

<b><i>Student Name(s)</i></b>	<b><i>School</i></b>	<b><i>Category</i></b>	<b><i>Project Title</i></b>
<i>Artash Nath</i>	<i>École Secondaire Toronto Ouest</i>	<i>Physical Sciences</i>	<i>Using Machine Learning To Remove Noise From Stellar Spots In Exoplanetary Data Form Space Telescopes</i>

<i>Christine Ye</i>	<i>Eastlake High School</i>	<i>Physical Sciences</i>	<i>Novel Surveys Of Substructure In Pulsar Glitch Morphology And Glitching Pulsar Populations</i>
<i>Maya Butani</i>	<i>Moorestown High School</i>	<i>Biology</i>	<i>Putting The Plant In Transplant: Plant Scaffolds For Bone Tissue Engineering</i>
<i>Milidu Jayaweera</i>	<i>La Cueva High School</i>	<i>Technology</i>	<i>Mission-Critical Communications Planning Over Contested RF Spectrum With Deep Reinforcement Learning Aided Artificial Intelligence</i>
<i>Neil Mitra</i>	<i>Waterloo Collegiate Institute</i>	<i>Technology</i>	<i>A Graphene Oxide Integrated Paper Microfluidic Device For Detecting And Predicting Myocardial Infarctions</i>

**JUNIOR INSCO CATEGORY AWARDS**  
*AWARDED TO THE TOP JUNIOR PROJECT IN EACH CATEGORY*

**TECHNOLOGY**

COMMEMORATIVE CERTIFICATE FROM INSPOSCIENCE CANADA, SHIPPED INSCO MERCHANDISE

Milidu Jayaweera	La Cueva High School	Technology	Mission-Critical Communications Planning Over Contested RF Spectrum With Deep Reinforcement Learning Aided Artificial Intelligence
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**BIOLOGY**

COMMEMORATIVE CERTIFICATE FROM INSPOSCIENCE CANADA, SHIPPED INSCO MERCHANDISE

Maya Butani	Moorestown High School	Biology	Putting The Plant In Transplant: Plant Scaffolds For Bone Tissue Engineering
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**PHYSICAL SCIENCES**

COMMEMORATIVE CERTIFICATE FROM INSPOSCIENCE CANADA, SHIPPED INSCO MERCHANDISE

Christine Ye	Eastlake High School	Physical Sciences	Novel Surveys Of Substructure In Pulsar Glitch Morphology And
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Glitching Pulsar  
Populations

## ENVIRONMENT

COMMEMORATIVE CERTIFICATE FROM INSPO SCIENCE CANADA, SHIPPED INSPO MERCHANDISE

Reva Gandhi

Parkland High School

Environment

BioSkin: Saving People  
And The Planet Through  
Increasing The Shelf Life  
Of Produce

## JUNIOR INSPO PRIME AWARD

AWARDED TO THE BEST OVERALL JUNIOR PROJECT

- MAGMA EXPONENTIAL RESEARCH FAIR  
AN ALL EXPENSES PAID TRIP TO COMPETE IN BARCELONA, SPAIN IN FEBRUARY 2021 AS A REPRESENTATIVE OF TEAM NORTH AMERICA.
- SPONSORED BY NSERC, GIVEN THE DISTINCTION OF "NSERC YOUNG INNOVATOR"
- \$25,000 USD SCHOLARSHIP TO THE ROCHESTER INSTITUTE OF TECHNOLOGY

Christine Ye

Eastlake High School

Physical Sciences

Novel Surveys Of  
Substructure In Pulsar  
Glitch Morphology And  
Glitching Pulsar  
Populations

## SENIOR INSPO MERIT AWARDS

AWARDED TO THE TOP OVERALL PROJECTS

## HONORABLE MENTIONS

- top 45% of all finalists -

<i>Student Name(s)</i>	<i>School</i>	<i>Category</i>	<i>Project Title</i>
<i>Amanda Hardman</i>	<i>Spruce Grove Composite High School</i>	<i>Environment</i>	<i>The Effect Of Nano-Crystalline Cellulose Coated Packaging On Shelf Life Of Fresh Produce</i>
<i>Anika Mistry</i>	<i>Scotts Valley High School</i>	<i>Technology</i>	<i>A 360° Video-Based Virtual Reality Aid To Teach Social-Emotional Skills To Individuals With Developmental Disabilities</i>
<i>Aris Zhu</i>	<i>Hamilton High School</i>	<i>Biology</i>	<i>CASA: A Novel Intracanal Medicament</i>



			<i>For Endodontic Infections</i>
<i>Paulina Naydenkov</i>	<i>Albuquerque Institute of Math and Science</i>	<i>Physical Sciences</i>	<i>Hierarchically Engineered Nanotheranostic for Ovarian Cancer Treatment</i>
<i>Arjun Moorthy</i>	<i>BASIS Scottsdale</i>	<i>Biology</i>	<i>ImmunoNET: A Novel In Silico Platform To Personalize Immunotherapy For Breast Cancer Treatment</i>
<i>Arya Tschand</i>	<i>High Technology High School</i>	<i>Technology</i>	<i>A Novel Approach To Developing An Affordable Recurrent Neural Network Based Autonomous Irrigation System Optimized For Power Self-Sufficiency</i>
<i>Braxton Chan</i>	<i>Mount Baker Secondary School</i>	<i>Biology</i>	<i>Human Fibrocartilage Transplantation For Osteochondral Defects</i>
<i>Claudia Zhang</i>	<i>Holmdel High School</i>	<i>Biology</i>	<i>The Use Of Multiplexed Proteomic Approaches And Machine Learning Algorithms To Drive The Design Of Personalized Cancer Vaccines</i>
<i>Edward Kim</i>	<i>Tenafly High School</i>	<i>Technology</i>	<i>Incorporating Kinesthetic Illusion With Force-Sensitive Device To Aid Hand Grasp During Space Travel</i>
<i>Eric Feng</i>	<i>Mounds View High School</i>	<i>Biology</i>	<i>The Time Course Of Murine Cardiomyocyte Maturation</i>
<i>Etienne Joulin</i>	<i>London Central Secondary School</i>	<i>Biology</i>	<i>A Computational Comparative Genomic Analysis Of Parasite-Host Relationships Using Genomic Signatures</i>
<i>Eunice Fabricante and Sean Ticsay</i>	<i>Sisler High School</i>	<i>Biology</i>	<i>Applying Iodine Photochemistry</i>

<i>Govardhan Poondi and John Rho</i>	<i>Plano West Senior High School</i>	<i>Technology</i>	<i>Non-Invasive Auditory Attention Decoding Approach To Cocktail Party Problem Using Deep Learning</i>
<i>Hui Xu</i>	<i>The Hun School of Princeton</i>	<i>Physical Sciences</i>	<i>Hydrogen Diffusion in Indium Oxide</i>
<i>Juliana Koen Alonso</i>	<i>Holy Heart High School</i>	<i>Biology</i>	<i>The Effect Of The Engrailed Gene And Transforming Growth Factor Beta (TGF-<math>\beta</math>) On The Migration Of Ovarian Cancer Cells</i>
<i>Kaleena Roeva and Sahiti Rachakonda</i>	<i>Thomas Jefferson High School for Science and Technology</i>	<i>Technology</i>	<i>A Mobile Application Utilizing A Machine Learning Approach For Early Diagnosis Of Glaucomatous Visual Field Loss</i>
<i>Kevin Yang</i>	<i>South San Francisco High School</i>	<i>Biology</i>	<i>DIMA Elicits A Synthetic Lethal Effect In Cells Overexpression The Myc Oncoprotein By Acting As A Dual Inhibitor Of MKLP2 And Aurora-B Kinase</i>
<i>Mani Chadaga and Akshay Nambudiripad</i>	<i>Saint Paul Central High School</i>	<i>Technology</i>	<i>Development Of WALTER: A Route Planning System That Analyzes Accident Data To Determine Fast, Simple, And Safe Driving Routes</i>
<i>Maya Clapperton and Mitchell Clapperton</i>	<i>Westdale Secondary School</i>	<i>Technology</i>	<i>Reducing Barriers To Hydrokinetic Energy: An Autonomous Turbine Installation And Retrieval System</i>
<i>Michelle Nazareth</i>	<i>Georgiana Bruce Kirby Preparatory School</i>	<i>Biology</i>	<i>RNA Regulation: Identifying And Preventing AMP Depurination In Early Life RNA Polymerization</i>
<i>Milan Jostes</i>	<i>Stillwater Area High School</i>	<i>Technology</i>	<i>Developing Fours 2.0 – A Web Hosting Software That Uses Encrypted Quick Response Code To</i>

			<i>Reduce Violence In Schools</i>
<i>Purva Gupta</i>	<i>Parkland High School</i>	<i>Technology</i>	<i>A Novel Detection Tool For Parkinson's Using Articulation Patterns And Machine Learning</i>
<i>Rachel Li</i>	<i>Parkland High School</i>	<i>Biology</i>	<i>Determining Drug Effectiveness Between Melaleuca Alternifolia Oil And Cocos Nucifera Oil Against Fungal Infections</i>
<i>Sahana Magipudi</i>	<i>Breck School</i>	<i>Biology</i>	<i>The Missing Link: Glycoengineering MSCs For Targeted Cancer Drug Delivery</i>
<i>Shaheer Arif</i>	<i>Richland High School</i>	<i>Biology</i>	<i>Thermal Alkaline Pretreatment of Yard Trimmings for Enhanced Anaerobic Digestion</i>
<i>Shamel Basaria</i>	<i>Gwinnett School of Mathematics, Science, and Technology</i>	<i>Biology</i>	<i>Direct Oral Anticoagulants for Treatment of Venous Thromboembolism in Patients with Thrombophilia</i>
<i>Shayaan Kaleem</i>	<i>Bayview Secondary School</i>	<i>Biology</i>	<i>Angiotensin Receptor Blockers in the Prevention of Barrett's Carcinogenesis</i>
<i>Vikas Ummadisetty and Veena Ummadisetty</i>	<i>Dublin High School</i>	<i>Biology</i>	<i>Prediction and Classification of Alzheimer's Disease Using Early-Integration Multi-Modality Convolutional Neural Networks</i>
<i>Yug Yadava</i>	<i>Marine Academy of Technology and Environmental Science</i>	<i>Biology</i>	<i>The Relationship Between Vitamin D Levels and Brain Volume in Children with Demyelinating Disease of The Central Nervous System</i>

<i>Zhengru (James) Fang</i>	<i>Upper Saint Clair High School</i>	<i>Technology</i>	<i>State-of-the-Art Deep Learning Diagnosis of Arrhythmias</i>
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## BRONZE MEDALISTS

*- top 30% of all finalists -*

\$15,000 USD ENTRANCE SCHOLARSHIPS TO THE ROCHESTER INSTITUTE OF TECHNOLOGY, SHIPPED MEDAL + CERTIFICATE

<i>Student Name(s)</i>	<i>School</i>	<i>Category</i>	<i>Project Title</i>
<i>Abhitha Vegi and Priyanka Jakka</i>	<i>Mission San Jose High School</i>	<i>Technology</i>	<i>A Novel Method of Screening for Rheumatoid Arthritis Using Machine Learning</i>
<i>Aditi Subramanyam</i>	<i>Tesla Stem High School</i>	<i>Biology</i>	<i>Identifying the Role of TEAD Proteins and The Pharmacological Disruption of Oncogenic YAP1 Fusions</i>
<i>Aravind Krishnan</i>	<i>Hillsborough High School</i>	<i>Biology</i>	<i>A Novel Assay to Quantitatively Detect Bacterial Endotoxin by Harnessing PAMP-Triggered Immunity of FRK1-LUC Arabidopsis Thaliana</i>
<i>Beatrice Youd</i>	<i>Beloit Turner High School</i>	<i>Environment</i>	<i>Septic System Caused Phosphate Loading Prevention Analysis Via Biodegradable Filters</i>
<i>Christopher Chong</i>	<i>David Thompson Secondary</i>	<i>Environment</i>	<i>Hydrofinity: Improving the Water-Energy Nexus in Thermos-Electric Powerplants Via an Electrostatically Assisted Technique</i>
<i>Emma Lo</i>	<i>The Shipley School</i>	<i>Biology</i>	<i>Integrated Analysis of Blood Biomarkers of Major Depressive Disorder Susceptible Genes</i>
<i>Ethan Dunsworth</i>	<i>Wentzville Holt High School</i>	<i>Biology</i>	<i>Exploring the Mechanisms of Major Depression and Antidepressant</i>

			<i>Response Using Gene and miRNA Expression</i>
<i>Harini Somanchi</i>	<i>Thomas Jefferson High School for Science and Technology</i>	<i>Biology</i>	<i>Cardiomyopathic Chagas Disease: An Exploration of Diagnostic Ability Via Nanoparticle Biomarker Capture GluOx Pathway and Perseus-Based Machine Learning</i>
<i>Jay Iyer</i>	<i>Baton Rouge Magnet High School</i>	<i>Biology</i>	<i>Synthesis and Characterization of a Novel PROTAC Containing A <math>\beta</math>-Hairpin Sequence Motif</i>
<i>Julia Kagiliery</i>	<i>The Episcopal School of Jacksonville</i>	<i>Environment</i>	<i>A Dual Sensor Machine Learning Approach to Sulfur Quantification of Lignite Coal</i>
<i>Laalitya Acharya</i>	<i>William Mason High School</i>	<i>Technology</i>	<i>Nereid: Using A Convolutional Neural Network (CNN) Approach, An AI Technique, To Rapidly and Accurately Detect Microbes That Might Cause Water-Borne Disease</i>
<i>Laurence Liang</i>	<i>Marianopolis College</i>	<i>Technology</i>	<i>Developing An AI-Based Genetic Computer Model to Activate Neuron Regeneration</i>
<i>Mina Mandic</i>	<i>St. Paul Academy and Summit School</i>	<i>Physical Sciences</i>	<i>Exploring the Wonders of The Early Universe: Green Pea Galaxies and Light Flux</i>
<i>Neha Sonthi</i>	<i>Stanton College Preparatory</i>	<i>Biology</i>	<i>Elucidating the Role of Neuropilin 1 In Chemotherapy Drug Mediated Cardiotoxicity Using Zebrafish Embryos</i>
<i>Sally Barksdale</i>	<i>Episcopal School of Jacksonville</i>	<i>Biology</i>	<i>The Effect of Anti-PD1 And Anti-PDL1 On the Cytokine Profile and Immune System</i>

<i>Simon Narang</i>	<i>Pittsford Sutherland High School</i>	<i>Physical Sciences</i>	<i>Modeling for Direct Drive Fusion Implosions; Cryogenic Target Filling at Arbitrary Viewing Angles and Yield Prediction</i>
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## SILVER MEDALISTS

*- top 15% of all finalists -*

\$18,000 USD ENTRANCE SCHOLARSHIPS TO THE ROCHESTER INSTITUTE OF TECHNOLOGY, SHIPPED MEDAL + CERTIFICATE

<i>Student Name(s)</i>	<i>School</i>	<i>Category</i>	<i>Project Title</i>
<i>Brendon Matusch</i>	<i>Lo-Ellen Park Secondary School</i>	<i>Technology</i>	<i>Evaluating Agents Without Rewards</i>
<i>David Kang</i>	<i>John Randolph Tucker High School</i>	<i>Biology</i>	<i>Investigation of Novel Tryptophan Derivatives from The Human Gut Microbiome on Cancer Cells and Pathogenic Bacteria: Identifying Novel Endogenous Candidates for Anticancer and Antibiotic Treatment</i>
<i>Gloria Huang</i>	<i>The Carol Martin Gatton Academy of Mathematics and Science</i>	<i>Technology</i>	<i>Finding the Most Influential Factors in The Healing Process of Diabetic Foot Ulcers Using Parameter Space Geometry</i>
<i>James Licato</i>	<i>Washington-Liberty High School</i>	<i>Environment</i>	<i>Optimizing Metformin Removal Utilizing Molecular Sieves and Absorbents</i>
<i>Risha Dianne Valera</i>	<i>Plano West Senior High School</i>	<i>Environment</i>	<i>Agrobotics: An Arduino Due/Uno Computer Vision-Based Raspberry Pi High Throughput Plant Phenotyping Precision Agriculture Robot Using A Dual Linear Mechanism</i>
<i>Rohan Anne</i>	<i>University School of Milwaukee</i>	<i>Biology</i>	<i>The Potential Pathophysiological Role of STING in The</i>

<i>Sarah Michelle Díaz Martínez and Martín Morales Trejo</i>	<i>CBTis 118</i>	<i>Environment</i>	<i>Development of Hypertensive Nephropathy</i>
<i>Zoe Gotthold</i>	<i>Richland High School</i>	<i>Environment</i>	<i>Retention and Transformation System of Polluting Substances Generated by Gasoline Automobiles</i>
<i>Sparsh Agrawal</i>	<i>Fort Richmond Collegiate</i>	<i>Technology</i>	<i>P.E.N.G.U.I.N.S. Promoting Emulsion Nullification Greenly Using Innovative Nucleation Surfaces</i>
<i>Tarun Kumar Martheswaran</i>	<i>The Waterford School</i>	<i>Technology</i>	<i>A Machine-Learning Framework for A Novel 3-Step Approach for Real-Time Taxi Dispatching</i>
<i>Xiangyuan Ma</i>	<i>Unionville High School</i>	<i>Physical Sciences</i>	<i>An Enhanced Early Detection Model of Dengue Fever Outbreaks Using SEIR Infectious Disease Epidemiological Compartments, Generalized Linear Regression Relationships, And Statistical Computing</i>
			<i>DeepSETI</i>

## GOLD MEDALISTS

- top 5% of all finalists -

\$20,000 USD ENTRANCE SCHOLARSHIPS TO THE ROCHESTER INSTITUTE OF TECHNOLOGY, SHIPPED MEDAL + CERTIFICATE

<i>Student Name(s)</i>	<i>School</i>	<i>Category</i>	<i>Project Title</i>
<i>Henry Berger</i>	<i>Brighton High School</i>	<i>Technology</i>	<i>Design of a Single-Hit Neutron Spectrometer for D-D Fusion</i>
<i>Neil Deshmukh</i>	<i>Moravia Academy</i>	<i>Technology</i>	<i>An Adaptive, Low-Cost Device for Automated Offline Medical Analysis Utilizing Interpretable Neural Networks with Reinforcement Learning Optimization</i>

*Perisa Ashar*

*Maggie L. Walker  
Governor's School for  
Government and  
International Studies*

*Biology*

*Development of A Novel  
Biomarker Panel for  
Treatment and Rapid  
Identification of Lung  
Cancer by Noninvasive,  
Blood-Based Tests  
Utilizing Next-  
Generation Sequencing,  
In-Vitro Analyses, And  
Bioinformatics*

*Prathysha Kothare*

*Parkland High School*

*Biology*

*Unfolding the Mysteries  
of The VonWillebrand  
Factor: Developing  
Predictive Models to  
Study Disease  
Mechanisms and  
Advance Targeted  
Treatments*

*Winston Y. Li*

*High Technology High  
School*

*Biology*

*Immuno-Metabolic  
Reprogramming of  
Macrophage Phenotypes*

## **SENIOR INSCO CATEGORY AWARDS**

*AWARDED TO THE TOP SENIOR PROJECT IN EACH CATEGORY*

### **TECHNOLOGY**

#### EXOMOONAI INTERNSHIP

A REMOTE, 1-2 MONTH, CONTRACT-BASED, PAID AI/APP DEV. PROJECT, WITH COMPENSATION UPON SATISFACTORY COMPLETION. YOU WILL WORK ON A HARD, PRACTICAL, INDUSTRY PROBLEM, IN AN AGILE ENVIRONMENT FOR ONE OF EXOMOONAI'S CLIENT(S).

Neil Deshmukh

Moravia Academy

Technology

An Adaptive, Low-Cost  
Device for Automated  
Offline Medical Analysis  
Utilizing Interpretable  
Neural Networks with  
Reinforcement Learning  
Optimization

### **BIOLOGY**

#### RESEARCH PUBLICATION & ABRF SYMPOSIUM ATTENDANCE

A GUARANTEED PUBLICATION OF YOUR MANUSCRIPT IN THE PEER-REVIEWED INT. JOURNAL OF BIOTECHNOLOGY AND BIOCHEMISTRY. YOU WILL ALSO GET AN ALL EXPENSES PAID TRIP TO ATTEND THE ASSOCIATION OF BIOMOLECULAR RESOURCE FACILITIES (ABRF) 2021 ANNUAL MEETING HELD IN BOSTON, MASSACHUSETTS.

Perisa Ashar

Maggie L. Walker  
Governor's School for

Biology

Development of A Novel  
Biomarker Panel for  
Treatment and Rapid



Government and  
International Studies

Identification of Lung  
Cancer by Noninvasive,  
Blood-Based Tests  
Utilizing Next-  
Generation Sequencing,  
In-Vitro Analyses, And  
Bioinformatics

## PHYSICAL SCIENCES

### CANADIAN NATIONAL PHYSICS TOURNAMENT

AN ALL EXPENSES PAID TRIP TO COMPETE IN THE CANADIAN YOUNG PHYSICISTS' TOURNAMENT (CAYPT) 2021 HOSTED BY STEM FELLOWSHIP AT THE UNIVERSITY OF TORONTO. THE TOP TEAM AT CAYPT WILL BE SPONSORED TO REPRESENT CANADA AT THE GLOBAL LEVEL AT THE IYPT.

Xiangyuan Ma

Unionville High School

Physical Sciences

DeepSETI

## ENVIRONMENT

### TEAM NORTH AMERICA GENIUS OLYMPIAD

AN ALL EXPENSES PAID TRIP TO REPRESENT TEAM NORTH AMERICA IN THE 2021 GENIUS OLYMPIAD, AN INTERNATIONAL HIGH SCHOOL ENVIRONMENTAL PROJECT COMPETITION HELD IN ROCHESTER, NEW YORK. YOU WILL SHOWCASE YOUR PROJECT TO FELLOW ENVIRONMENTALISTS AND COMPETE FOR AWARDS.

James Licato

Washington-Liberty  
High School

Environment

Optimizing Metformin  
Removal Utilizing  
Molecular Sieves and  
Absorbents

## SENIOR INSCO PRIME AWARD

*AWARDED TO THE BEST OVERALL SENIOR PROJECT*

- KOREA SCIENCE & ENGINEERING FAIR

**AN ALL EXPENSES PAID TRIP TO COMPETE IN DAEJEON, KOREA IN OCTOBER 2020 AS A REPRESENTATIVE OF TEAM NORTH AMERICA.**

- SPONSORED BY MAYAN TECHNOLOGIES, GIVEN THE DISTINCTION OF "MAYAN RESEARCH PIONEER"
- *\$25,000 USD SCHOLARSHIP TO THE ROCHESTER INSTITUTE OF TECHNOLOGY*

Neil Deshmukh

Moravia Academy

Technology

**An Adaptive, Low-Cost  
Device for Automated  
Offline Medical Analysis  
Utilizing Interpretable  
Neural Networks with  
Reinforcement Learning  
Optimization**

## SPONSORED AWARDS

AWARDED SPECIFICALLY BASED ON SPONSOR CRITERIA

## DROP THE STEM PEOPLE'S CHOICE AWARD

AN OPPORTUNITY TO SHARE YOUR PROJECT AND PERSONAL STORY ON THE GLOBAL DROP THE STEM PODCAST.

*Khushi Parikh*

*Gilbert Classical  
Academy*

*Technology*

*A Deep Convolutional  
Neural Network to  
Detect Antibiotic  
Resistance  
Polymorphisms in S.  
Pneumoniae DNA*

## FORUM FOR YOUNG CANADIANS AWARD

FULL \$995 PROGRAM BURSARY FOR FORUM 2021 (INCLUDES TRANSPORTATION TO AND FROM OTTAWA, MEALS, ACCOMMODATION, AND PROGRAM FEES).

*Artash Nath*

*École Secondaire  
Toronto Ouest*

*Physical Sciences*

*Using Machine Learning  
to Remove Noise from  
Stellar Spots in  
Exoplanetary Data Form  
Space Telescopes*

Laurence Liang

Marianopolis College

Technology

Developing An AI-Based  
Genetic Computer Model  
to Activate Neuron  
Regeneration

Nethra Wickramasinghe

Lockerby Composite  
High School

Technology

A Novel  
Neuropsychiatric  
Wearable System Using  
Cognitive Behavioral  
Therapy

Sparsh Agrawal

Fort Richmond  
Collegiate

Technology

A Machine-Learning  
Framework for A Novel  
3-Step Approach for  
Real-Time Taxi  
Dispatching

## HELYX INITIATIVE BIOINFORMATICS AWARD

AN ENTRY INTO HELYX'S SELECTIVE PEER-REVIEWED JOURNAL FOR PUBLISHING, THE OPPORTUNITY TO BE A GUEST ON HELYX'S PODCAST, AS WELL AS AN INDUCTION INTO THE HELYX STUDENT RESEARCH SOCIETY.

*Perisa Ashar*

*Maggie L. Walker  
Governor's School for  
Government and  
International Studies*

*Biology*

*Development of A Novel  
Biomarker Panel for  
Treatment and Rapid  
Identification of Lung  
Cancer by Noninvasive,  
Blood-Based Tests  
Utilizing Next-  
Generation Sequencing,*

## **NEW YORK ACADEMY OF SCIENCES AWARD**

INDUCTION INTO THE NEW YORK ACADEMY OF SCIENCES, BECOMING PART OF THE WORLD'S SMARTEST NETWORK AS A STUDENT MEMBER WITH FULL ACCESS TO PROFESSIONAL MENTORING, NETWORKING AND RESUME-BUILDING OPPORTUNITIES, CAREER READINESS AND SOFT SKILLS TRAINING & CUTTING-EDGE STEM CONTENT.

*Reva Gandhi*      *Parkland High School*      *Environment*      *BioSkin: Saving People and The Planet Through Increasing the Shelf Life of Produce*

*Purva Gupta*      *Parkland High School*      *Technology*      *A Novel Detection Tool for Parkinson's Using Articulation Patterns and Machine Learning*

## **NOKIA FUTURE TECH INTERNSHIP AWARD**

A GUARANTEED PLACEMENT IN THE PAID NOKIA FUTURE TECH SUMMER INTERNSHIP CANADA PROGRAM FOR THE 2021 SESSION, WHICH WILL TAKE PLACE OVER A SEVEN-WEEK PERIOD IN JULY AND AUGUST.

*Caroline Huang*      *Abbey Park High School*      *Biology*      *Computing Neuroregeneration; Simulating Cognitive Function with Physarum AI*

*Neil Mitra*      *Waterloo Collegiate Institute*      *Technology*      *A Graphene Oxide Integrated Paper Microfluidic Device for Detecting and Predicting Myocardial Infarctions*

*Vansh Sethi*      *Colonel by Secondary School*      *Technology*      *Predicting Chimeric Antigen Receptor T-Cell Specificity Given the Epitope Sequence of An Antigen Using Sequence2Sequence Learning and Classification*

## **SCOTIABANK PATENT GRANT**

A US, CANADIAN, OR MEXICAN (DEPENDING ON THE WINNER'S COUNTRY) PATENT'S FILING & EXAMINATION FEES FULLY SPONSORED FOR A PROJECT, IDEA, DESIGN OR SPECIFIC PROCESS, DEEMING THEIR INVENTION PATENT-PENDING.

Henry Berger Brighton High School Technology

Design of a Single-Hit Neutron Spectrometer for D-D Fusion

### SHAD CANADA AWARD

SCHOLARSHIP IN THE AMOUNT OF \$1,500 FOR SHAD 2021.

*Sparsh Patel Westwood Community High School Technology*

*Focus: A Novel Approach Towards A Computerized Brain Sensing System Utilizing Artificial Neural Networks Magnetoencephalography and Electroencephalography Technology*

*Raphael Kelly Archbishop MacDonald High School Biology*

*Assessing Human Impact on Migratory Bird Species Using GIS Software and Statistics*

### SIGMA XI RESEARCH AWARD

CASH AWARD FROM THE SCIENTIFIC RESEARCH HONOR SOCIETY.

*Risha Dianne Valera Plano West Senior High School Environment*

*Agrobotics: An Arduino Due/Uno Computer Vision-Based Raspberry Pi High Throughput Plant Phenotyping Precision Agriculture Robot Using A Dual Linear Mechanism*

*Sowmya Chundi Carmel High School Biology*

*Designing A Tumor-Specific Oncolytic Virus to Induce Suicide Gene Expression in Glioblastoma Cancer*

### SIMPLY NEUROSCIENCE AWARD

AN INVITATION TO PRESENT YOUR RESEARCH AT SIMPLY NEUROSCIENCE'S INTERNATIONAL SIMPLY NEUROCON CONFERENCE IN AUGUST 2020, AND BE FEATURED ON AN EPISODE OF SN'S PODCAST: THE SYNAPSE.

*Hanzala Subhani Westminster Secondary School Biology*

*IPSC-DCX+ Cells: An Alternative Treatment Option for Neurodegenerative Diseases*

## STEM FELLOWSHIP PUBLICATION AWARD

A GUARANTEED SCIENTIFIC RESEARCH PUBLICATION (WITH MENTORSHIP) IN THE 2020 EDITION OF THE PEER-REVIEWED STEM FELLOWSHIP JOURNAL. STUDENTS WILL HAVE THE OPPORTUNITY TO WIN A \$500 PRIZE AND AN ANNUAL SUBSCRIPTION TO SELECT SCIENCE PUBLISHING JOURNALS.

*Winston Y. Li*

*High Technology High  
School*

*Biology*

*Immuno-Metabolic  
Reprogramming of  
Macrophage Phenotypes*

## THE KNOWLEDGE SOCIETY (TKS) AWARD

SCHOLARSHIP IN THE AMOUNT OF \$1000 FOR TKS 2020-2021.

*Aravind Krishnan*

*Hillsborough High  
School*

*Biology*

*A Novel Assay to  
Quantitatively Detect  
Bacterial Endotoxin by  
Harnessing PAMP-  
Triggered Immunity of  
FRK1-LUC Arabidopsis  
Thaliana*

*Ryan Park*

*Millburn High School*

*Technology*

*X-Net: A Deep  
Convolutional Neural  
Model for X-Ray Threat  
Detection*

## WISEST SRP EXTERNSHIP AWARD

A GUARANTEED PLACEMENT IN THE WOMEN IN SCHOLARSHIP, ENGINEERING, SCIENCE & TECHNOLOGY SUMMER RESEARCH PROGRAM TO PARTICIPATE IN A 6 WEEK PAID INTERNSHIP IN 2021 (INCLUDES TRANSPORTATION TO AND FROM THE UNIVERSITY OF ALBERTA, MEALS, AND ACCOMMODATION).

*Patricia Rea*

*Markham District High  
School*

*Biology*

*BioGrade Yeast: A Novel  
Approach to Colonising  
Mars with An Actin-  
Antifreeze Protein  
Polymer*

## AMERICAN SOCIETY FOR VIROLOGY AWARD

CASH AWARD FROM THE FIRST SCIENTIFIC SOCIETY IN THE WORLD DEDICATED EXCLUSIVELY TO VIROLOGY.

*Tarun Kumar  
Martheswaran*

*The Waterford School*

*Technology*

*An Enhanced Early  
Detection Model of  
Dengue Fever Outbreaks  
Using SEIR Infectious  
Disease Epidemiological  
Compartments,  
Generalized Linear  
Regression*

## HONORARY PLAQUE AWARDS OF DISTINCTIONS

### WATERLOO INSTITUTE FOR NANOTECHNOLOGY AWARD

*Neil Mitra*                      *Waterloo Collegiate  
Institute*                      *Technology*                      *A Graphene Oxide  
Integrated Paper  
Microfluidic Device For  
Detecting And  
Predicting Myocardial  
Infarctions*

### MARS INSTITUTE AWARD

*Xiangyuan Ma*                      *Unionville High School*                      *Physical Sciences*                      *DeepSETI*

### ASSOCIATION OF BIOMOLECULAR RESOURCE FACILITIES AWARD

*Maya Butani*                      *Moorestown High  
School*                      *Biology*                      *Putting The Plant In  
Transplant: Plant  
Scaffolds For Bone  
Tissue Engineering*

### SCIENCE MEDIA CENTRE OF CANADA AWARD

*Prathysha Kothare*                      *Parkland High School*                      *Biology*                      *Unfolding the Mysteries  
of The VonWillebrand  
Factor: Developing  
Predictive Models to  
Study Disease  
Mechanisms and  
Advance Targeted  
Treatments*

### WESTERN UNIVERSITY ENGINEERING AWARD

*Victor Cai*                      *Parkland High School*                      *Technology*                      *Designing A  
Narrowband Radar  
Using Software Defined  
Radio (SDR) For  
Tomography and Indoor  
Sensing*

### SOCIETY OF ECONOMIC PALEONTOLOGISTS, MINERALOGISTS AND SEDIMENTARY GEOLOGY AWARD

*Purvi Sehgal*                      *BASIS Chandler*                      *Environment*                      *The Effect of Various  
Glaciogenic Seeding  
Agents and*

*Temperatures on the  
Rate of Ice Crystal  
Nucleation*

**SOCIETY FOR CANADIAN WOMEN IN SCIENCE & TECHNOLOGY AWARD**

*Sowmya Chundi*

*Carmel High School*

*Biology*

*Designing A Tumor-  
Specific Oncolytic Virus  
To Induce Suicide Gene  
Expression In  
Glioblastoma Cancer*

**CANADIAN COUNCIL ON GEOMATICS - CENTRE FOR MAPPING AND EARTH  
OBSERVATION AWARD**

*Sparsh Agrawal*

*Fort Richmond  
Collegiate*

*Technology*

*A Machine-Learning  
Framework for A Novel  
3-Step Approach for  
Real-Time Taxi  
Dispatching*

**BIRDS CANADA AWARD**

*Raphael Kelly*

*Archbishop MacDonald  
High School*

*Biology*

*Assessing Human  
Impact on Migratory  
Bird Species Using GIS  
Software And Statistics*

**EVIDENCE FOR DEMOCRACY AWARD**

*Milan Jostes*

*Stillwater Area High  
School*

*Technology*

*Developing Fours 2.0 – A  
Web Hosting Software  
That Uses Encrypted  
Quick Response Code To  
Reduce Violence In  
Schools*