

## 2022 CSRSEF Awards

### Best of Fair

Grand Champion With Distinction, ISEF finalist	Pinyu Liao	Inglemoor HS	Exploiting Vectors of Resistance: In-Silico Discovery of Novel Antibiotic Targets in Plasmid R1 to Combat Antibiotic Resistance
Grand Champion, ISEF finalist	Vedant Srinivas Druhin Bhowal, Arihant Singh	Eastlake HS	Rapid Animal Detection and Driver Warning System to Mitigate Roadkill
Grand Champion, ISEF finalist		Tesla STEM HS	It's Flaming Out: Using Artificial Intelligence to Emulate Critical Aspects of Wildfire Growth
Grand Champion, ISEF finalist	Anjali Sreenivas	Tesla STEM HS	A Machine Learning Approach to Identifying Blood-Based Biomarkers for Differential Diagnosis of Alzheimer's Disease
Grand Champion, ISEF finalist	Rishi Hazra	Skyline HS	Characterization of enzymes, Chalcone Synthase, Chalcone Isomerase, and Dihydroflavonol 4-Reductase, by X-Ray Crystallography to improve the efficacy of crops Panicum virgatum and Sorghum bicolor as potential USDA Biofuel Sources.

### Category Awards

#### Behavioral & Social Science

First Place	Cindy Chen	Tesla STEM HS	Facial and Emotional Recognition Among Caucasian and East Asian Adolescents
First Place	Jingyi Zhao	Bear Creek School	Development: Mathematically Modeling the Rate of Return and Analyzing Student Benefits
Second Place	Aastha Shah	Tesla STEM HS	Evaluating the Relationship Between Stress and Impulsivity in a Mathematical Context
Third Place	Vijaya Sripada	Tesla STEM HS	Using Various Inputs of Smell to Reduce Depression Score in Alzheimer Patients
Fourth Place	Aryaman Rtunjay	Tesla STEM HS	Predicting Parkinsons Disease Using a Highly Accurate Convolutional Neural Network
Fourth Place	Praharsha Manda	Tesla STEM HS	Development of the Educator IAT

#### Biomedical Engineering & Translational Health

First Place	Rhea Kuppa	Tesla STEM HS	3D Printing Bio-Inspired Heart Valves to Increase Efficiency of Preoperative Care.
Second Place	Aubrey Grove	Tesla STEM HS	Assessment of Yoga Therapy and Mindfulness-Based Therapy Interventions on Symptom Severity and Quality of Life in a Cohort of Adults with Inflammatory Bowel Disease
Third Place	David Gershoney	Tesla STEM HS	Combatting Anxiety in Dental Offices using Virtual Reality
Fourth Place	Brooke Rinehimer	MTHS	A Strategy for Defining the Correlation Between ADHD-Related Genes and Medication Efficacy in Individuals Using Publicly-Available Data Sets

#### Environmental Engineering

First Place	Vedant Srinivas	Eastlake HS	Computer Vision Based Rapid Animal Detection and Driver Warning System For Day and Night Time Conditions
Second Place	Dhruv Darbha	Redmond HS	Tackling Food Waste Using Hyperspectral Imaging
Third Place	Alyssa Lin Kerensa Suzara, Ainsley	BellevueHS	SCIENTIFIC AND ECONOMIC FEASIBILITY ASSESSMENT OF USING INTELLIGENT PACKAGING TO REDUCE FRESH FOOD WASTE
Fourth Place	Ward, Gwyneth Balite	MTHS	The Papermaker

#### **SOFT/EBED/ROBO**

First Place	Audrey Gruian	Eastlake HS	ALDIN: An Intelligent, Stereoscopic Aerial Olfactory System for Autonomous Odor Localization
Second Place	Edward Zhou	Tesla STEM HS	Dampening Phantom Shockwave Jams in Mixed-Autonomy Traffic via Deep-RL Control of Autonomous Vehicles
Third Place	Ananya Vaidyaraman	Interlake HS	Learning
Fourth Place	Nikolas Faulkner	MTHS	Advancements in Analog Audio Recording Through Pulse Width Modulated Optical Recording

#### **CBIO**

First Place	Anjali Sreenivas	Tesla STEM HS	A Machine Learning Approach to Identifying Blood-Based Biomarkers for Differential Diagnosis of Alzheimer's Disease
Second Place	Vineel Bhat	Eastlake HS	Resolving Discordant and Missing Variant Classifications in Clinical Data to Advance the Prediction of Monogenic Disease Risk
Third Place	Anya Vaish	Tesla STEM HS	Automated pill dispenser to improve medication compliance, efficiency, and accuracy
Fourth Place	Bliss Singhal	Issaquah HS	An Efficient Machine Learning Model that Detects Metastatic Cancer Cells in Pathology Scans by Utilizing Principal Component Analysis Algorithm, Genetic Algorithm, and Classification Algorithms

#### **CELL/MCRO/BMED/TMED**

First Place	Kashvi Pundir	North Creek HS	Effect of Creatine supplementation on muscle regeneration in doxorubicin-induced myotoxicity
Second Place	Natasha Murugan	Eastlake HS	High-throughput screening of Hippo-YAP pathway proteins for cardiac regeneration
Third Place	Tanvi Sapar, Shivani Godse	Tesla STEM	Creating a Structural Model of saSrtA-Inhibitor Complex to Predict Efficiency of Class A Sortase Enzyme Inhibitor Molecules
Fourth Place	Ria Bahadur	Eastlake Prep	Improving Patch Clamp Analysis for Piezo1 mechanosensitive ion channels for higher predictability of Vascular Disorders

#### **Organismal Biology**

First Place	Pinyu Liao	Inglemoor HS	Exploiting Vectors of Resistance: In-Silico Discovery of Novel Antibiotic Targets in Plasmid R1 to Combat Antibiotic Resistance
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Second Place	Ayesha Khan	Eastlake HS	Finding an Alternative Solution: The Effect of the Antibacterial Properties of Essential Oils Against Resistant Gram-Positive and Gram-Negative Infectious Bacteria in Vitro
Third Place	Danyuan Wang	Tesla STEM HS	Using Machine Learning Methods to Estimate the Concentration of Phytoplankton Impacts of Mycorrhizae and Fertilizer on the Germination and Growth of Chia, Chives, and Cilantro.
Fourth Place	Mackenzie Kier	MTHS	
<b>Chemical, Earth, Environmental Sciences, Technology</b>			
First Place	Rishi Hazra, Druhin Bhowal, Arihant Singh	Skyline HS	Characterization of enzymes, Chalcone Synthase, Chalcone Isomerase, and Dihydroflavonol 4-Reductase, by X-Ray Crystallography to improve the efficacy of crops Panicum virgatum and Sorghum bicolor as potential USDA Biofuel Sources.
First Place		Tesla STEM HS	It's Flaming Out: Using Artificial Intelligence to Emulate Critical Aspects of Wildfire Growth
Second Place	Evan Kim	Tesla STEM HS	Utilizing a Generative Adversarial Network to Predict Hypothetical Superconductors Using Brightness-Temperature Differences from the Cross Track InfraRed Sounder for Improved Wildfire Detection and Analysis
Third Place	Richard Li Ethan Weight, Seamus Whalen-Robinson	Bellevue HS	
Fourth Place		MTHS	Concentrating Sunlight to Create Solar Radiation Shields for Lunar Habitats
<b>Mechanical Engineering</b>			
First Place	Christopher Kelly, Imad Morsli	MTHS	Demonstrating and Improving the Technology of Slow Flight for Application in Agriculture
Second Place	Mason Towne	MTHS	Magnetic Water Ski Binding System
Third Place	Anisha Vaish	Tesla STEM HS	Automated pill dispenser to improve medication compliance, efficiency, and accuracy
Fourth Place	John Burbank	MTHS	Hand trailer for medium-sized water craft
<b>Physics &amp; Astronomy/Math</b>			
First Place	Harish Krishnakumar	Tesla STEM HS	Analysis of Ring Galaxies Detected Using Deep Learning with Real and Simulated Data Inferring the Neutron Star Maximum Mass and Lower Mass Gap in Spinning Neutron Star-Black Hole Systems
Second Place	Christine Ye	Eastlake HS	
Second Place	Thuc Nguyen	West Seattle HS	The Power Law of Continuous Zeros
Third Place	Sophia Wu	Newport HS	A Novel 6-Dimensional Optical Position Sensor
Fourth Place	Abraham LeBaron, Nazareth Rajala-Jolfre, Devon Shelton	Kamiak HS	Enhanced Interplanetary Travel Technologies

## Special Awards

### American Institute of Aeronautics & Astronautics, \$50

Christopher Kelly, Imad Morsli  
MTHS  
Demonstrating and Improving the Technology of Slow Flight for Application in Agriculture

### American Meteorological Society

Suyash Mothukuri  
Tesla STEM HS  
Diagnosing Precipitation from IR Satellite Images

### American Society for Materials (ASM)

Evan Kim  
Tesla STEM HS  
A Generative Adversarial Network to Predict Hypothetical Superconductors Utilizing

### American Psychological Association

Karina Amit Kejriwal  
Tesla STEM HS  
The Impact of Credibility When Hitting "Purchase Now"

### Mu Alpha Theta

Thuc Xuan Nguyen  
West Seattle HS  
The Power Law of Continuous Zeros

### NASA Earth System Award

Edmunda Li  
Homeschool  
A Fire Detection Method Using Brightness-Temperature Differences and the Atmospheric InfraRed Sounder

### NOAA "Taking the Pulse of the Planet Award"

Cleo Williams, Jillian Berry, Mia Elsberry  
MTHS  
Thermodynamic and Kinetic Analysis of Microalgae Remediation of Phenol Red Dye

### Office of Naval Research

Sophia Wu  
Newport HS  
A Novel 6-Dimensional Optical Position Sensor

### Regeneron Biomedical Science Award, \$500

Anjali Sreenivas  
Tesla STEM HS  
A Machine Learning Approach to Identifying Blood-Based Biomarkers for Differential Diagnosis of Alzheimer's Disease

### RICOH Sustainable Development Award

Rishi Hazra  
Skyline HS  
Characterization of enzymes ... by X-Ray Crystallography to improve the efficacy of crops ... as potential USDA Biofuel Sources.

### Stockholm Junior Water Prize

	Isabelle Allred	MTHS	Comparison and Analysis of Microplastics Concentrations Across the Puget Sound Through Seawater, Sediment, and Mytilus Edulis Sampling
	Siddhant Porwal	Tesla STEM HS	Predicting Waterfall Forms through Feature Engineering and Model-Selection Machine Learning
<b>US Air Force Award</b>	Monisha Krothapalli	Tesla STEM HS	Engineering a Subsurface Flow Constructed Wetland to Evaluate Efficiency for Combatting Water Scarcity
	Audrey Gruian	Eastlake HS	ALDIN: An Intelligent, Stereoscopic Aerial Olfactory System for Autonomous Odor Localization
<b>WSSEF Outstanding Project Achievement Award</b>			
	Nidhi Achanta	Liberty HS	Design enhancement for vacuum system viewport technologies associated with semiconductor manufacturing!
<b>Yale Science &amp; Engineering, Best 11th Grade Award</b>			
	Pinyu Liao	Inglemoor HS	Exploiting Vectors of Resistance: In-Silico Discovery of Novel Antibiotic Targets in Plasmid R1 to Combat Antibiotic Resistance