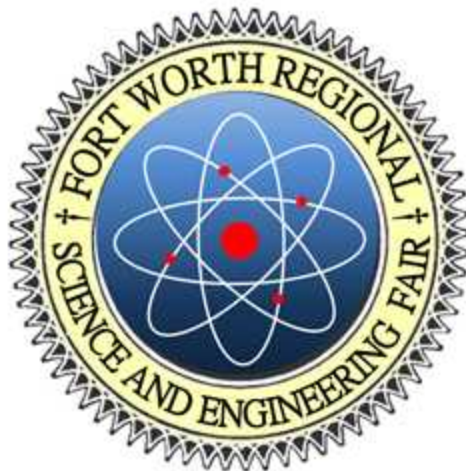
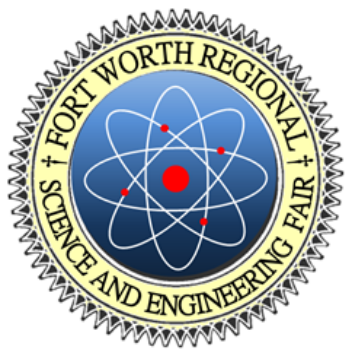




# 2022 Fort Worth Regional Science and Engineering Fair

## Category Awards Senior Division





# 2022 Fort Worth Regional Science and Engineering Fair

## Animal Sciences

### Senior Division

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**1st Place:** The Analysis of the Synergistic Effects of Curcumin and Light Therapy in Wound Healing of *D. tigrina*

**Project ID:** 160753

**School:** Colleyville Heritage High School

**Students:** Mehreen Chowdhury

**2nd Place:** Analysis of the Effects of Caffeine and Caffeine-Withdrawal on *Drosophila Melanogaster* Activity

**Project ID:** 162538

**School:** Colleyville Heritage High School

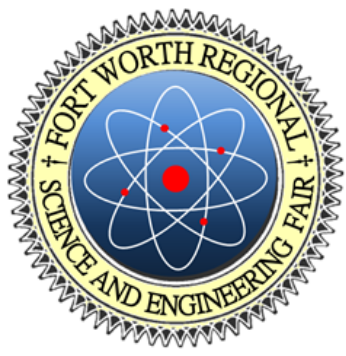
**Students:** Gabrielle Love

**3rd Place:** Operation Chub-Bee: Comparing the Practicality of Homemade and Commercial *Apis mellifera* Pollen Substitutes

**Project ID:** 170963

**School:** Colleyville Heritage High School

**Students:** Joeun Kim, Nhi Quach



# 2022 Fort Worth Regional Science and Engineering Fair

## Behavioral & Social Sciences Senior Division

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**1st Place:** Evaluating Psychological Principles through User Experience Design

**Project ID:** 162093

**School:** Colleyville Heritage High School

**Students:** Jenna Hassan

**2nd Place:** Analyzing the Effects of Bilingualism on Stroop Interference and Reaction Time

**Project ID:** 161315

**School:** Colleyville Heritage High School

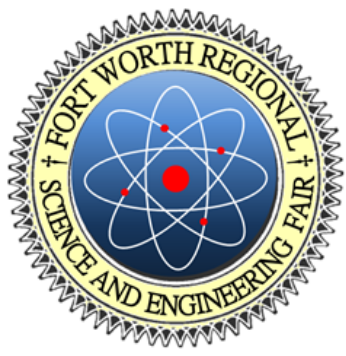
**Students:** Jiarui Qin

**3rd Place:** A Comparative Gender Study Analyzing the Effect of Color on Information Retention and Memory in High School Students

**Project ID:** 160747

**School:** Colleyville Heritage High School

**Students:** Emily Weaver



# 2022 Fort Worth Regional Science and Engineering Fair

## Biochemistry, Cellular, & Molecular Biology

### Senior Division

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**1st Place:** Elucidating the Pathways & Genomic Trajectories of Ovarian Cancer Persister Cells: Utilizing Single-Cell Transcriptomic Analysis on Patient Samples and Cell Line Models to Identify Ovarian Cancer Resistance Mechanisms

**Project ID:** 170111

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Anay Gupta

**2nd Place:** Conversion of Specific Single-Carbon Compounds to  $\hat{I}^3$ -Aminobutyric Acid (GABA) Via Native and Heterologous Expression in the *Methylococcus Capsulatus* Metabolic Biochemical Cascade

**Project ID:** 169787

**School:** Texas Academy Of Mathematics And Sciences HS

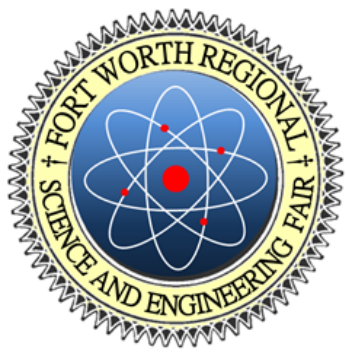
**Students:** Etash Bhat

**3rd Place:** Combination Therapy of Recombinant Thrombomodulin with Gemcitabine for Pancreatic Ductal Adenocarcinoma

**Project ID:** 169283

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Pranavi Garlapati



# 2022 Fort Worth Regional Science and Engineering Fair

## Chemistry Senior Division

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**1st Place:** Breaking Chemical Bonds by Force: A Computational Investigation of Metal C-H Interaction Under High Pressure

**Project ID:** 170100

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Carly Yang

**2nd Place:** Determination of Abraham Model Solute Descriptors for Hippuric Acid from Measured Molar Solubilities in Several Organic Mono-solvents of Varying Polarity and Hydrogen-Bonding Ability

**Project ID:** 169887

**School:** Texas Academy Of Mathematics And Sciences HS

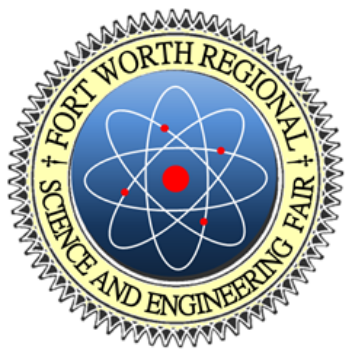
**Students:** Sneha Sinha, Advika Varadharajan

**3rd Place:** Synthesis of Morphology Dependent Antibacterial Properties of Micro- and Nanoscale Zinc Oxide (ZnO)

**Project ID:** 170807

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Rohit Maheshwari



# 2022 Fort Worth Regional Science and Engineering Fair

## Computer Science Senior Division

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**1st Place:** Novel-DTI - A Machine Learning Pipeline Created to Predict Drug-Target Interactions for Large-Scale Drug Repurposing and Drug Discovery using Multiplex, Heterogeneous Networks

**Project ID:** 170334

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Shreya Amalapurapu

**2nd Place:** Logistic Regression Machine Learning Model for Glycemic Index Prediction

**Project ID:** 170812

**School:** Texas Academy Of Mathematics And Sciences HS

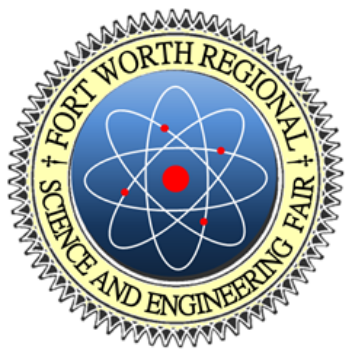
**Students:** Shreema Vijayakumar

**3rd Place:** Mass Spectrometry Proteomics

**Project ID:** 170806

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Jonathan He, Olivia Liu



# 2022 Fort Worth Regional Science and Engineering Fair

## Earth & Planetary Sciences Senior Division

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**1st Place:** Using Three Natural Polymers to Create An Efficient Hybrid Bioplastic

**Project ID:** 180991

**School:** Granbury High School

**Students:** Scout Skaggs

**2nd Place:** The Planet Needs Our Kelp! The Analysis of the Carbon Sequestration Potential of Macroalgae

**Project ID:** 161319

**School:** Colleyville Heritage High School

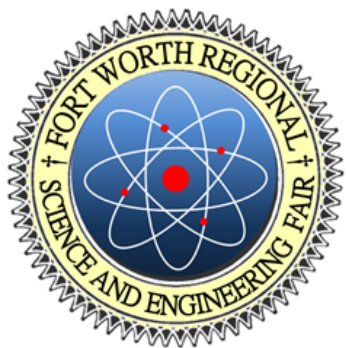
**Students:** Trinity Nguyen

**3rd Place:** Analyzing landfill soil bacteria under specific conditions to maximize the biodegradation of polyethylene terephthalate plastic

**Project ID:** 161460

**School:** Colleyville Heritage High School

**Students:** Brooklyn Rice



# 2022 Fort Worth Regional Science and Engineering Fair

## Energy & Transportation Senior Division

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**1st Place:** Density Functional Study Determining Group 13 Periodic Trends for the More Accurate Prediction of Optimal Trier-Based Catalyst Models for Methane Activation and Functionalization

**Project ID:** 170108

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Drishti Gupta

**2nd Place:** Comparing the Efficiency of Homemade Energy-Fueled Briquettes From Food Waste to Coal Briquettes

**Project ID:** 160749

**School:** Colleyville Heritage High School

**Students:** Kailey Tran

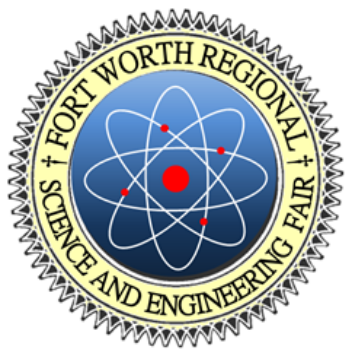
**3rd Place:** The Analysis on the Effect of Rich-Chlorophyll Foods on Dye-Sensitized Solar Cells and Its Voltage

**Project ID:** 160767

**School:** Colleyville Heritage High School

**Students:** Tiana Caotran





# 2022 Fort Worth Regional Science and Engineering Fair

## Engineering: Electrical & Mechanical Senior Division

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**1st Place:** Microfluidic Fabrication of Photonic Microlasers

**Project ID:** 169925

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Jayanth Pandit, Bhanuprakash Kunam

**2nd Place:** Autonomously Controlling Unmanned Aerial Vehicles (UAVs) Through Machine Vision Algorithms

**Project ID:** 170107

**School:** Texas Academy Of Mathematics And Sciences HS

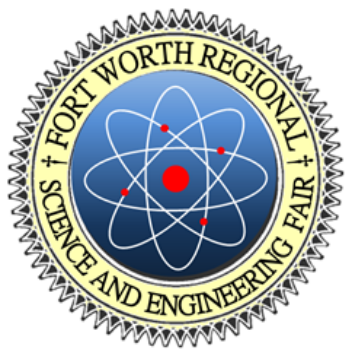
**Students:** Belinda Dong, Adam Chen

**3rd Place:** Analyzing and Identifying Optimal Meshing Structures For Laminar Flows in Various Pipes

**Project ID:** 173272

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Vishal Sathish



# 2022 Fort Worth Regional Science and Engineering Fair

## Engineering: Materials & Bioengineering Senior Division

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**1st Place:** SIDS Mattress: Determining Infant Physiological Parameters with PVDF Sensors and Microphones to Detect SIDS with OCC Modeling

**Project ID:** 179867

**School:** The Oakridge School

**Students:** Eshan Singhal

**2nd Place:** A Frugal Method of Identifying Basal Cell Carcinoma and Various Diseases with the Application of Machine Learning in Histological Analysis.

**Project ID:** 170458

**School:** Texas Academy Of Mathematics And Sciences HS

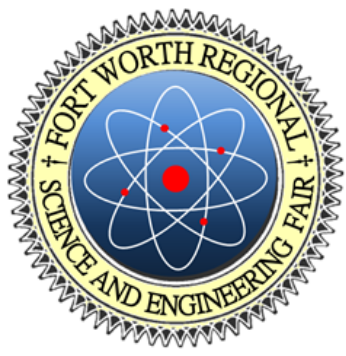
**Students:** Emmanuel Roy, Dhiraj Bijinepally, Kevin Zheng

**3rd Place:** Preventing Bacterial Formation Through the Application of Cationic Polymers to Electrospun Polyvinyl Alcohol

**Project ID:** 161318

**School:** Colleyville Heritage High School

**Students:** Amie Ha



# 2022 Fort Worth Regional Science and Engineering Fair

## Environmental Management & Sciences Senior Division

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**1st Place:** Abraham Model Description of the Solubilising Properties of the Isopropyl Acetate Organic Mono-solvent

**Project ID:** 175000

**School:** Texas Academy Of Mathematics And Sciences HS

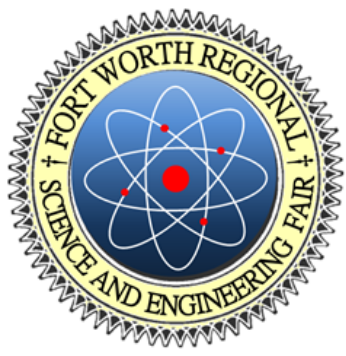
**Students:** Sophia Cai

**2nd Place:** Testing the efficiency of varying renewable energy sourcesâ€™ rates of power conversion.

**Project ID:** 175459

**School:** Summit International High School

**Students:** Tabitha Hare



# 2022 Fort Worth Regional Science and Engineering Fair

## Mathematical Sciences Senior Division

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**1st Place:** Optimizing Micro-Computer Architecture in the Arithmetic Logic Unit

**Project ID:** 174949

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Emily Troutman

**2nd Place:** A Graph-Theoretic Approach Using Monte Carlo Simulations to Model the Progression of Mental Health in Social Networks

**Project ID:** 174431

**School:** Texas Academy Of Mathematics And Sciences HS

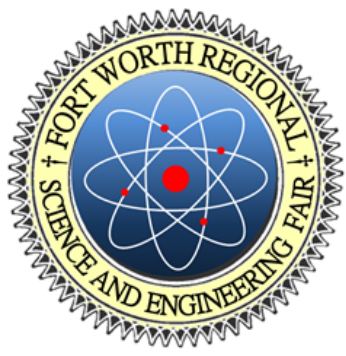
**Students:** Ria Garg, Nora Xiao

**3rd Place:** Improving the Grocery Store Shopping Experience for the Older Population

**Project ID:** 169084

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Daisy Gan, Manya Trisha



# 2022 Fort Worth Regional Science and Engineering Fair

## Medicine & Health Sciences Senior Division

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**1st Place:** An Investigation In Fabricating A Technological Solution That Identifies External Skin Conditions Using Machine Learning

**Project ID:** 170773

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Vineeth Murugan

**2nd Place:** Evaluating Electrocardiograms and Diagnosing Various Heart Conditions via Convolutional Neural Networks

**Project ID:** 170779

**School:** Texas Academy Of Mathematics And Sciences HS

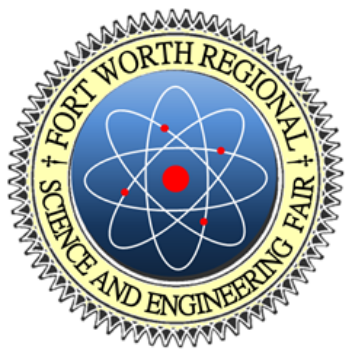
**Students:** Sophia Zhang

**3rd Place:** Masking Policy and Covid-19 Positivity Rate in Texas School Districts

**Project ID:** 179721

**School:** Martin Stem School

**Students:** Maya Shah



# 2022 Fort Worth Regional Science and Engineering Fair

## Microbiology

### Senior Division

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**1st Place:** Identifying Metabolites in *A. Heteromorphus* and *Magnaporthe Grisea* and Overproduction of Cytochalasins

**Project ID:** 169776

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Arianna Fa, Neha Singaravelan

**2nd Place:** The Analysis of Essential Oils, Plant Extracts, and the Synergistic Effects Against Gram-Negative Bacteria

**Project ID:** 160750

**School:** Colleyville Heritage High School

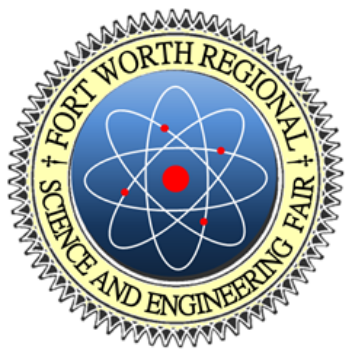
**Students:** Makayla Jang

**3rd Place:** The Effect of Antiseptics on E-coli Growth

**Project ID:** 163089

**School:** Summit International High School

**Students:** Helena Smith, Jardyn Waldon



# 2022 Fort Worth Regional Science and Engineering Fair

## Physics & Astronomy Senior Division

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**1st Place:** The Application of Geometric Optics and Photosensitivity in Detection of Water Soluble Heavy Metal Ions

**Project ID:** 163735

**School:** Colleyville Heritage High School

**Students:** Ayush Bindal

**2nd Place:** Earth to Mars: Growing Photosynthetic Anaerobic Bacteria on Stimulant Martian Soil Under Anaerobic Conditions.

**Project ID:** 163438

**School:** Colleyville Heritage High School

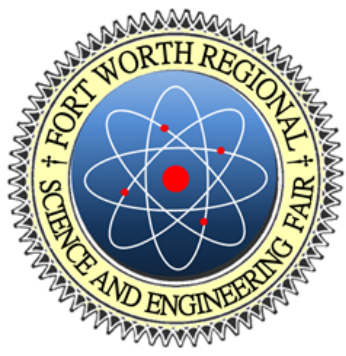
**Students:** Mouktika Sripati

**3rd Place:** Temperature Torpedo

**Project ID:** 179728

**School:** Northstar High School

**Students:** Keegan Vogel



# 2022 Fort Worth Regional Science and Engineering Fair

## Plant Sciences

### Senior Division

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**1st Place:** Using a Yeast-2-Hybrid Screen to Identify Interactors of RGPA1: A Gene That Induces Plant Defense Responses Against Green Peach Aphid (GPA) in *Arabidopsis thaliana*

**Project ID:** 171232

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Shreya Nair, Siddhartha Shah

**2nd Place:** A Study of the Role of Dehydroabietinal and its Related Metabolites on Plant Development and Defense Mechanisms

**Project ID:** 170109

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Simali Shah

**3rd Place:** Prediction of Plant Cuticle Pollutant Uptake Using the Abraham Model

**Project ID:** 170784

**School:** Texas Academy Of Mathematics And Sciences HS

**Students:** Angelina Xu