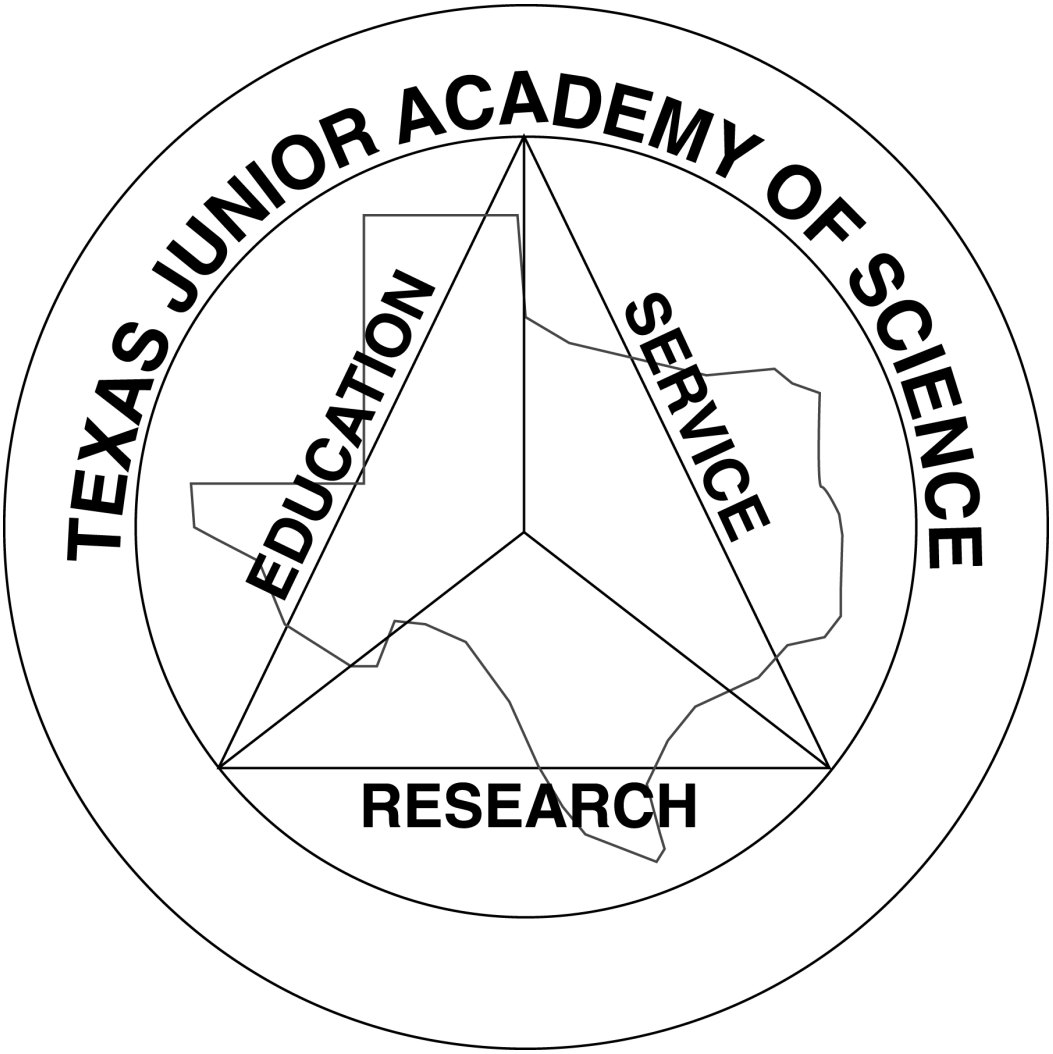

October 13-14, 2022

TEXAS A&M UNIVERSITY

HOSTED BY: COLLEGE OF ARTS & SCIENCES

TEXAS—2022

SCHEDULE OF EVENTS

Thursday, October 13, 2022

8:30 a.m. Judging — Memorial Student Center (see presentation schedule for rooms)

6:00 p.m. Casual Dinner — Memorial Student Center (MSC) 2400

Friday, October 14, 2022

8:30 a.m. Finals Judging
Natural Science Division — MSC 2406 A
Physical Science and Engineering Division — MSC 2406 B

Participant free time after last finals presentation (est. 10:30 a.m. to noon) until Awards Ceremony to grab lunch, visit a campus venue, or just enjoy the break!

12:00 p.m. Awards Ceremony — MSC 2400

Texas Junior Academy of Science Administration Room is located in Memorial Student Center 2404.

AWARDS

All participants will receive a Texas Junior Academy of Science medallion and certificate indicating First, Second, Third or Honorable Mention in competition.

The overall first place in each category will be announced at the dinner on Thursday evening and will present again to the finalist judges on Friday morning to determine the overall top six presenters.

The top six overall finalists will each receive a plaque, monetary award, and invitation to present at the American Junior Academy of Science (AJAS) convention held in conjunction with the annual meeting of the American Association for the Advancement of Science (AAAS) 2023 AJAS/AAAS Conference March 2-5, 2023 in Washington, D.C

For more information on the annual meeting: https://meetings.aaas.org

ACKNOWLEDGEMENTS

Thanks to our Texas Junior Academy of Science State Competition sponsors!

College of Arts & Sciences at Texas A&M University
Texas Academy of Science

Thank you to all of the Texas Junior Academy of Science State Competition judges! The competition could not run without your dedication to science education.

Please check in at the table in front of MSC 2400 prior to going to your presentation room.

BE PREPARED: If a presenter on the schedule does not attend then the next presenter on the schedule will move into that time-slot.

Make sure you are in the room of your presentation at least 2-3 talks prior to your start time.

INFORMATION

Texas Academy of Science http://www.texasacademyofscience.org/

Texas Junior Academy of Science State Counselor:

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Texas Junior Academy of Science State Competition is coordinated and hosted by:

Educational Outreach and Women's Programs
https://scienceoutreach.tamu.edu/

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Student Assistant

Enzo Vela
Student Assistant

Schedule of Presentations

Biochemistry/Microbiology

MSC 2502

01:30 PM	**Manyaa Bhatia** Reedy High School	Development of an In-Silico Pipeline for Microbial Life Genome Detection in Blood and Organ Donations
01:50 PM	**Arianna Fa** Texas Academy of Mathematics and Sciences	Identifying Metabolites Produced by A. heteromorphus and M. grisea and the Overproduction of Cytochalasins
02:10 PM	**Pranav Gorty** IB World School	Finding A Novel Prerequisite Inhibitor Computationally To Target RAD51 Function In Cancer Cells
02:30 PM	**Zehra Jaffery** Plano West Senior High School	The Mechanism of Methylmercury Permeation Through the Blood-Brain Barrier using Caenorhabditis elegans
02:50 PM	**Shriya Bhat** Plano East Senior High School	Cloning and Mutagenesis of the ampC Gene Encoding for Beta-lactamase in Pseudomonas aeruginosa to Identify Potential Allosteric Binding Sites
03:10 PM	BREAK	
03:30 PM	**Chloe Lee** IB World School	The Effect of Mebendazole on the Viability of Prostate Cancer Cells
03:50 PM	**Shreya Pillamari** Texas Academy of Mathematics and Sciences	Determining the Binding Affinity of Fluorescent and Non-fluorescent Peptides to Tropomyosin
04:10 PM	**Manshi Swain** Wakeland High School	The impact of sexually dependent steroid hormones on the size and frequency of SNB neurons
04:30 PM	**Sydney Vincer** IB World School	Sports Drinks for Diabetics: Which One Raises Blood Sugar the Fastest?

Botany/Zoology

MSC 2504

01:30 PM	**Prisha Bhat** Plano East Senior High School	Rhizoremediation with Agro-transformed Oryza sativa to facilitate Arsenic degradation in-situpH
01:50 PM	**Arnav Bhute** Williams High School	Allelopathic Plant Characteristics and Protection of Native Plants through Soil pH
02:10 PM	**Vallerie Cheng** Texas Academy of Mathematics and Sciences	Study of Thrombocyte Production Post Knockdown of NFE2l1b in Zebrafish
02:30 PM	**Gabriela Miller** Williams High School	‘Killed in Cold Blood': Observing the Effects of Varying Temperatures on the Growth of order Diptera
02:50 PM	BREAK	
03:10 PM	**Shreya Nair** Texas Academy of Mathematics and Sciences	Identification and Characterization of Genes Functioning with HR4, a Newly Identified Gene Conferring Resistance to the Green Peach Aphid
03:30 PM	**Victoria Rangel** John Jay Science and Engineering Academy	Bioluminescent Light
03:50 PM	**Arundhati Vankayalapati** IB World School	How Plasmid Concentration affects the Surface Area of Soybeans and a Potential Solution to Air Pollution
04:10 PM	**Alexander Cheung** Jasper High School	Is Compost the Fertilizer of the Future?

Chemistry

MSC 2503

01:30 PM	**Joseph Garcia** John Jay Science and Engineering Academy	Calorimetric analysis of biodiesel from Oils of Glycine-Max, Brassica-Napus, Zea-Mays, Olea-Europaea, and Vitis-Vinifera
01:50 PM	**Simona Kao** Liberal Arts & Science Academy	Anion Binding and Recognition through Secondary Bonding Interactions in Solution

02:10 PM	**Alden Pool** John Jay Science and Engineering Academy	Investigating the Effects of Surface Area on Charcoal Briquettes and its Impact on Performance
02:30 PM	**Rachel Pool** John Jay Science and Engineering Academy	Non-destructive rust removal using electrolysis: the effect of electrolyte concentration
02:50 PM	BREAK	
03:10 PM	**Shreyas Sailesh** Texas Academy of Mathematics and Sciences	Designing Carbon Nanotubes to act as a transmission medium for Neurological Signals Post-neurotmesis
03:30 PM	**Humberto Sanchez** John Jay Science and Engineering Academy	Discharge Dilemma
03:50 PM	**Kevin Sun** Plano West Senior High School	Transforming Organic Wastes into High Value Bioplastics
04:10 PM	**Ashley Thomas** Vines High School	Don't Sweat It

Computer Science

MSC 2503

08:30 AM	**Shobhit Agarwal** Reedy High School	OmniDoc: A Multimodal Quantum Machine Learning Approach to Diagnosis, Prognosis, and Treatment Prediction for Neurodegenerative and Cancerous Diseases
08:50 AM	**Dhroov Bharatia** Vines High School	QuakeWake: A Novel AI-Based Early Earthquake Warning and Post-Quake Building Safety Guidance System
09:10 AM	**Syed Husain** Plano West Senior High School	iSight: Artificial Intelligence Brings Vision to the Visually Impaired
09:30 AM	**Aditi Kavoor** Plano East Senior High School	A Study of Technoogical Systems Specializing in OCR Algorithms for Dyslexic Indviduals
09:50 AM	**Kapil Panda** Texas Academy of Mathematics and Sciences	Analysis of Optimal Portfolio Management Using Machine Learning Techniques

10:10 AM	BREAK	
10:30 AM	**Pulkith Paruchuri** Heritage High School	ParkinSense: Contactless Parkinson's Disease diagnosis, telemonitoring, and severity analysis via Machine Learning and Multimodal Digital Biomarkers
10:50 AM	**Meena Ramaswamy** Plano East Senior High School	A Non-Invasive AI Powered Solution to Predict Pancreatic Cancer Using Urinary Biomarkers
11:10 AM	**Raghav Ramki** Plano East Senior High School	Decoding Cancer: Biomarker Based Predictive Modeling of Population Level Signaling for Cancer Treatment Optimization
11:30 AM	**Hari Shankar** Reedy High School	PetalNet: A Novel Approach Towards Forecasting Plant Disease Epidemics using Citizen Science and Machine Learning
11:50 AM	**Vedant Sundar** IB World School	Developing an Efficient Cipher with the Strengths of Asymmetric and Symmetric Styles

Engineering I

MSC 2500

08:30 AM	**Trisha Desai** Jasper High School	Doorbell for the Hearing-Impaired
08:50 AM	**Sarang Goel** Texas Academy of Mathematics and Sciences	IVY: An Intelligent Vision System for the Visually Impaired
09:10 AM	**Arya Gurumukhi** IB World School	Supercapacitors: Improving Upon the Lithium-ion Battery Technology
09:30 AM	**Sanjana Kumar** Plano West Senior High School	Cost-Effective Covalent Organic Frameworks for Carbon Capture
09:50 AM	**Jayanth Pandit** Texas Academy of Mathematics and Sciences	FABRICATION OF PHOTONIC MICROLASERS VIA MICROFLUIDIC DOUBLE EMULSION

10:10 AM	BREAK	
10:30 AM	**Gautum Penna** Plano East Senior High School	Solar Trajectory Tracking and Optimal Panel Positioning based on Geolocation and Sun-Earth Geometry
10:50 AM	**Meghana Praveen Reddy** Jasper High School	Open Sesame: Automation of Gates to the Next Level
11:10 AM	**Anushka Sridhar** Plano East Senior High School	VIPR-Vibration Induced Parkinson
11:30 AM	**Varun Sridhar** IB World School	A Non-Invasive Multimodally-Sensing Prosthetic Hand System Integrated with Digitally-Embedded Smart Skin for Restoring Sensory Feedback for Amputees
11:50 AM	**Stephen Yang** Plano West Senior High School	Making High Temperature Sensing Practical With a Zero-Compromise, High-Gain Silicon Carbide Differential Amplifier

Engineering II

MSC 2500

01:30 PM	**Patrick Amann** John Jay Science and Engineering Academy	The Efficiency of Swimming Flippers
01:50 PM	**Juan Aldapa Avila** Harmony School of Excellence-Laredo	The Future of Fuels: Water
02:10 PM	**Otto Beall** Plano East Senior High School	Optimizing Solar Cell Metal Surface Geometries for Power Efficiency
02:30 PM	**Kelly Harr** McMillen High School	Stablizing Towers
02:50 PM	**Victor Moran** John Jay Science and Engineering Academy	Converting a Gas Engine to use Compressed Air

03:10 PM	BREAK	
03:30 PM	**Sanika Nandpure** Plano East Senior High School	A Novel Implementation of Piezoelectric Materials to Innovate the Next Generation of Self-Powered Computers
03:50 PM	**Gael Ramos Reyes** Harmony School of Excellence-Laredo	Module Exoskeleton
04:10 PM	**Kevin Su** Heritage High School	Angle and Polymer Bonding Strength Alterations in the Interface Positively Impacting Piezoelectric Properties
04:30 PM	**Siya Tripathi** IB World School	Wirelessly Locating Lost Devices Using An Application & Microcontroller
04:50 PM	**Anthony Xu** Allen High School	A low-power long-range localization system using Helium Network

Environmental Science

MSC 2502

08:30 AM	**Aneisha Gupta** Plano Senior High School	Noteworthy Nanos: The Use of Nanotechnology in Cleaning Oil Spills
08:50 AM	**Shreya Halbe** Plano West Senior High School	Comprehensive Analysis of Particulate Matter: Effects of Nano-layering on Liquid Volatile Organic Compounds Using Catalytic Metal Oxides
09:10 AM	**Madhalasa Iyer** Plano Senior High School	Co-cultivation of Isochrysis galbana and Bacillus megaterium for maximal TAG production for third-generation biofuels
09:30 AM	**Katherine Lee** Plano West Senior High School	Testing Aloidendron barberae and Bambusa dolichomerithalla as Natural Coagulants on Copper Ion Concentration Using UV-vis Spectrophotometry
09:50 AM	**Aaron Liu** St. Mark's School of Texas	AI Powered Canine Waste Disposal Unit

10:10 AM	BREAK	
10:30 AM	**Satvika Nadella** Allen High School	A Novel Water Filtration System for the Removal of Heavy Metals and Bacteria
10:50 AM	**Neha Nagarajan** Texas Academy of Mathematics and Sciences	Transgenerational Inheritance of Hypoxia Tolerance to Combat Oxygen Deprivation
11:10 AM	**Shivani Nathan** Jasper High School	Agricultural Crop Residues as Alternative Sources of Cellulose for Future Use in Thermoresponsive Hydrogels
11:30 AM	**Kiera Ocampo** John Jay Science and Engineering Academy	A Solar Panel Moisture Detection System for the Delivery of On-Demand Splash Zone Cooling
11:50 AM	**Aithreya Thoppay** Reedy High School	A Novel Hydrophobic Corn Stover Sponge With the Implementation of Iron Oxide Nanoparticles and Various Alterations in Material Chemistry

Medicine and Health/Behavioral and Social Sciences I

MSC 2501

08:30 AM	**Vedha Almeti** Williams High School	Did you Feel your Pulse Rising? A Psychophysiological Examination of People's Responses to Sensory Stimuli Based on Gender
08:50 AM	**Kaitlyn Fan** Jasper High School	A Machine-Learning Approach in Diagnosing and Categorizing Alzheimer's Disease
09:10 AM	**Manya Gummaraju** IB World School	Studying Drug-induced Movement Abnormalities in Drosophilia melanogaster Using a Novel Tracking Method with Vision-Based Software
09:30 AM	**Anjali Iyer** Plano Senior High School	Hyperphagia Knock Out: The Treatment of Prader Willi Syndrome via D-Galacturonic Acid as a Prebiotic Agent to Stimulate Anorexigenic Pathways by the S
09:50 AM	**Siri Peddinti** IB World School	PiRest: An Eye Fatigue Alert Device Using Computer Vision
10:10 AM	BREAK	

10:30 AM	**Alanna Polyak** Plano West Senior High School	Using Planarian Stem Cells on Lumbricina as a Model Organism to Investigate a Cure for Encephalomyelitis disseminata (Multiple Sclerosis)
10:50 AM	**Andy Qin** Plano West Senior High School	Intelligent Prediction of Early Student Failure
11:10 AM	**Diya Shah** Williams High School	The Salt to my Pepper: The Effects of Utilizing the Bioactive Descriptors of Piperoyl Piperidine on B16-F10 as a Neoteric Treatment for Melanoma
11:30 AM	**Sheila Zhang** Plano East Senior High School	Rice CRISPR Treat: A Method to Improve Detection of Off-Target CRISPR Cas9 Activity Using Deep Sequencing Data and Homology Targeted Integration

Medicine and Health/Behavioral and Social Sciences II

MSC 2501

01:30 PM	**Shreya Amalapurapu** Texas Academy of Mathematics and Sciences	ENStaDTI: An Ensemble Node Embedding and Novel Deep-Learning Framework for Drug-Target Interaction Prediction for Large-Scale Drug Repurposing
01:50 PM	**Harrison Conway** Lutheran South Academy	“Associations between Childhood Neighborhood Disadvantage and Adult Income: Longitudinal Evidence from a Representative U.S. Sample”
02:10 PM	**Elizabeth Grandinetti** Vines High School	In a sitch, with an under-cast itch?
02:30 PM	**Hannah Guan** BASIS Shavano	Multi-Dimensional Interpretable Interaction Network (MDiiN for Modeling Aging Health and Mortality
02:50 PM	**Medha Jain** Texas Academy of Mathematics and Sciences	Gene Co-Expression of Mycobacterium Tuberculosis
03:10 PM	BREAK	
03:30 PM	**Kyler Larsen** A&M Consolidated High School	A Deep Learning Approach Using Transformers for MRI Reconstruction of Undersampled K-Spaces

03:50 PM	**Madison Oliver** John Jay Science and Engineering Academy	Making sports for Visual impaired and blind more Equiltable
04:10 PM	**Nora Xiao** Texas Academy of Mathematics and Sciences	Integrating Latent Cause Inference into Actor-Critic Algorithms for Continual Learning
04:30 PM	**Sophia Zhang** Texas Academy of Mathematics and Sciences	Evaluating Electrocardiograms and Diagnosing Various Heart Conditions via Convolutional Neural Networks

Physics/Math/Earth and Space Sciences

MSC 2504

08:30 AM	**David Arnold** John Jay Science and Engineering Academy	Wireless Energy Transfer Using Lasers Year 3
08:50 AM	**Ian Chen** Plano West Senior High School	Perception Considerations in Maritime Detection Systems
09:10 AM	**Amitha Mandava** Plano East Senior High School	Traffic Counting System Using Machine Vision
09:30 AM	**Anirudh Mazumder** Grapevine High School	Kinematic Controller of a Soft Continuum Robot Using Learned Forward Models
9:50 AM	BREAK	
10:10 AM	**Dhilan Nag** Plano East Senior High School	Reversing the Decoherence of Qubits in a Quantum Computer by Approximating the Distance of Spatial Propagation of Entanglement
10:30 AM	**Ishan Vemireddy** Plano West Senior High School	Quantum Entanglement of Photons Using Potassium Dihydrogen Phosphate Crystals with Spontaneous Parametric Down Conversion
10:50 AM	**Nehal Singh** Texas Academy of Mathematics and Sciences	Quantum Computing with Crystallographic Defects: Design Principles from First-Principles Materials Theory and Transfer Learning

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