



MSEF
Massachusetts Science
+ Engineering Fair

HIGH SCHOOL FAIR
GILLETTE STADIUM
APRIL 5, 2024

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Official 2024 Program Book



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In partnership with **Massachusetts Science and Engineering Fair** we're working to provide the tools and building blocks students and teachers need to reach their full potential.

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Trainee Lucille, R&D platform, France©Vincent Fournier

We never settle

We are an innovative global healthcare company, driven by one purpose: we chase the miracles of science to improve people's lives.

We are dedicated to transforming the practice of medicine by working to turn the impossible into the possible. We provide potentially life-changing treatment options and life-saving vaccine protection to millions of people globally, while putting sustainability and social responsibility at the center of our ambitions.

Honored to support the Massachusetts Science & Engineering Fair and 75th anniversary of the High School State Fair.



To 75 Years of Innovative Programming

Since our inception 75 years ago, MSEF has remained steadfast in our commitment to encouraging scientific inquiry, nurturing curiosity, and honing the critical thinking skills of Massachusetts students. Our programming provides a platform for students to explore real-world STEM investigation through independent science research and engineering projects.

Participation in science fair equips students with a diverse array of skills, including verbal and written communication, problem-solving, teamwork, analytical reasoning, and attention to detail. Engaging in research promotes innovation by challenging students to apply these skills to ask hard questions and solve challenging problems—a necessity in today's rapidly evolving academic and professional landscapes.

Moreover, MSEF is dedicated to ensuring **equitable access to science fair opportunities** for all students. We firmly believe that every student deserves the chance to explore their world and deepen their understanding of science and engineering.

We are grateful for so many - judges who return year on year, regional chairs for whom science fair is their passion, sponsors who understand the importance of this work, and teachers who shepherd and support students through the ups and downs of independent work. Your generosity fuels our mission. We extend our heartfelt gratitude to all those who contribute their time, expertise, and resources to make MSEF a success year after year.

To all of this year's participants: congratulations on your remarkable achievements! Your dedication, curiosity, and passion for science are truly inspiring. As you showcase your projects and celebrate your hard work, remember that YOU are the future problem solvers and innovators who will shape our world for the better.

Welcome to the 75th Massachusetts Science & Engineering Fair. Let's make this milestone year one to remember!

Sincerely,

Helen Rosenfeld
Executive Director

Dan Leibholz
Chair, Board of Directors



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**SOLVING THE WORLD'S
MOST IMPORTANT
CHALLENGES WITH
HIGH PERFORMANCE
AND ADAPTIVE COMPUTING**

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(617) 725-4000

MAURA T. HEALEY
GOVERNOR

KIMBERLEY DRISCOLL
LIEUTENANT GOVERNOR

April 2024

Dear Friends:

On behalf of the Commonwealth of Massachusetts, Lieutenant Governor Driscoll and I would like to congratulate each and every high school student who has earned a place in the 2024 Massachusetts Science & Engineering Fair (MSEF).

We commend you for your innovative ideas, your diligence and your passion for science and technology. Now in its 75th year as a national academic leader, MSEF programs encourage all students to envision and pursue their futures in Science, Technology, Engineering, and Math (STEM), opening pathways and providing scholarships to the nation's best colleges, many of which are right here in Massachusetts. Advocating and supporting high quality STEM Education is an important priority for Massachusetts, and MSEF is a critical partner in helping us reach this goal.

We extend our congratulations to MSEF and the sponsors and partners who support it, including the many Massachusetts companies that are leaders in the science and technology sectors and our institutions of higher education, including the University of Massachusetts network. Lieutenant Governor Driscoll and I are grateful for the 75 years of service and contributions MSEF has made to the Commonwealth and are proud of this great milestone. By investing in STEM education we are not only investing in our children, but in our future of Massachusetts. It is important that we all continue to work together to encourage more students to pursue careers in STEM fields and to provide them with the tools and resources they need to become the successful leaders of tomorrow.

Lieutenant Governor Driscoll and I would like to thank you for all that you do and best of luck to all of the 2024 Science Fair participants.

Sincerely,

MAURA T. HEALEY
GOVERNOR

KIMBERLEY DRISCOLL
LIEUTENANT GOVERNOR

PRINTED ON RECYCLED PAPER

Where will
the next great
energy idea
come from?



Students who are excited about learning can accomplish anything.

Eversource is Powering the Possibilities by supporting the Massachusetts Science & Engineering Fair.

EVERSOURCE

Regional Fair Network

The efforts of Regional Fair Directors, Regional Committees, Educators and Volunteers play a crucial role in nurturing the next generation of scientists and innovators.

Thank you for your commitment to science fair as a method for fostering curiosity, creativity, and critical thinking skills!

REGION I: WESTERN MASSACHUSETTS

Western Mass Science & Engineering Fair

High School Fair Host:
Western New England University

High School Chair: Christian Salmon

Middle School Fair Hosts:
Massachusetts College of Liberal Arts
and Springfield Museums

Middle School Coordinators:
Ann Billetz, Massachusetts College of Liberal
Arts and Rachel Quimby, Hitchcock Center
for the Environment

REGION II: CENTRAL MASSACHUSETTS

Worcester Regional Science & Engineering Fair

High & Middle School Fair Host: Worcester
Polytechnic Institute

High School Chair: Taryn Surabian

Middle School Chairs: Lisa Greenwald
and Karin Lebeau

REGION III: SOUTHWESTERN MASSACHUSETTS

Bristol/Rensselaer Science & Engineering
High School Fair

High & Middle School Fair Host:
Bristol Community College, Fall River

High School & Middle School Chair:
Pallavi Naravane

REGION IV: NORTHEASTERN MASSACHUSETTS

Massachusetts Region IV Science Fair

High School Fair Host: Tufts University

High School Chair: Suzanne Stickley

Middle School Fair Host: UMass Lowell

Middle School Chair: Akshay Kokil

REGION V: SOUTHEASTERN MASSACHUSETTS

Massachusetts Region V Science & Engineering Fair

High School Fair Host: Bridgewater State University

High School Chair: Patricia Monteith

Middle School Fair Host: Regis College

Middle School Chair: Erin McQuaid

REGION VI: CITY OF BOSTON

Boston Public Schools STEM Fair

High & Middle School Fair Host:
Roxbury Community College

High School & Middle School Chairs:
Karissa Goff and Nicole Guttenberg

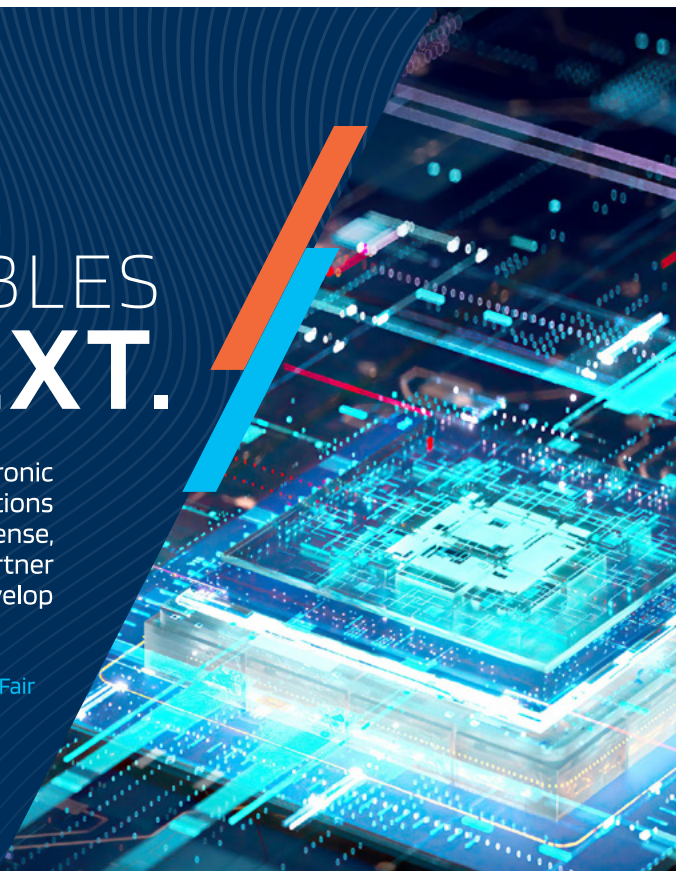


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Recognition to MSEF's University Partners

Our university partners enthusiastically provide scholarship awards. Through this support students can pursue their academic aspirations with confidence and determination.

Thank you for your commitment to excellence.

SCHOLARSHIPS

- Harvard Summer School – Secondary School Program (SSP)
- Merrimack College
- UMass Boston
- UMass Amherst
- Wentworth Institute of Technology
- Worcester Polytechnic Institute

Thank you to these university partners who year after year generously open their doors and host Regional Fairs. By contributing your facilities and sharing your resources, you provide students with an inspiring environment to showcase their talents and engage with the wider scientific community.

HOSTS

- Western New England University
- Massachusetts College of Liberal Arts
- Worcester Polytechnic Institute
- Bristol Community College
- Tufts University
- UMass Lowell
- Bridgewater State University
- Regis College
- Roxbury Community College



MathWorks proudly supports MSEF.



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MITRE AND MSEF: PARTNERS FOR PROGRESS THROUGH SCIENCE & ENGINEERING

MITRE is honored to be a sponsor of the Massachusetts Science & Engineering Fair (MSEF). We appreciate MSEF's work to develop future thought leaders through experiences in science and engineering practices, both well-proven and novel.

Since our inception, MITRE's mission-driven teams have consistently addressed the most complex whole-of-nation challenges that threaten our country's safety, security, and prosperity to drive innovation and accelerate solutions in the public interest.

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FOR A SAFER WORLD

Massachusetts LIFE SCIENCES CENTER

The Massachusetts Life Sciences Center is proud to sponsor the Massachusetts Science & Engineering Fair. We are excited to see the passion and innovative ideas being put forth by each of you. With you as our future, we know Massachusetts will continue to be the epicenter of the life sciences.

[Learn More](#)

2024 Science Fair Judges

Thank you for so generously donating your time and talent to support our student scientists and engineers.

Your commitment to fairness, objectivity, and excellence ensures that our participants receive valuable feedback and recognition for their hard work and ingenuity. Your expertise and insight inspire and motivate our students to reach for the stars and pursue their scientific aspirations with confidence.

On behalf of the entire science fair community, we extend our sincerest thanks and appreciation for your unwavering commitment and support.

75th

High School
State Fair

6

Regional High
School Fairs

400+

Judges

100+

Companies, educational institutions
and professional organizations
represented by our judges.

A special thank you to this year's Judge Advisory committee for your work on judge training and the development of the High School Rubric.

2024 JUDGE ADVISORY COMMITTEE

Karen Briley, *Invicro*

Elliot Entin, *Aptima (retired)*

Martin Glassman, *IEEE*

Keith Kawate, *Texas Instruments (retired)*

Stephanie Keep, *BiteScis*

Liz Rudnick, *Imaginic, Inc*

Trudi Veldman, *AbbVie*

Joerg Werner, *Boston University*

Hartmut Wohlrab, *Boston Children's Hospital*

Statewide Scientific Review Committee

This team of STEM professions collectively reviewed 788 projects for the 2024 Fair season! Reviewing these many projects across all content areas is no small feat! Your dedication helps foster a supportive environment for young scientists and ensures that their work meets high standards.

Thank you for your invaluable contribution to the MSEF community!

ITAMAR ALLALI

Brown University

MUHAMMAD ANAS IMTIAZ

Bloomberg LP

KATHLEEN BATEMAN

Boston Public Schools

MARIA BENNES

Assabet Valley Regional Vocational School District

EILEEN CORREIA

Bishop Feehan High School

TERRY GANI

Cabot Corporation

TIMOTHY HENDERSON

Draper Laboratory (retired)

SRIKANTH KAPALI

MathWorks

JUAN MARTINEZ-FRANCOIS

Harvard Medical School

CARINA MINARDI

STEM From

MARY RAPIEN

Bristol Community College

HAMAYLE SAEED

Joslin Diabetes Center, Harvard Medical School

JOSEPH SCHARITER

Moderna

JINYOUNG SEO

Harvard University

LATASHA SHEFFIELD

Athol-Royalston Regional School District

JON TYLER

Westfield High School

LEONITHAS VOLAKIS

Truveta

SARAH WEBSTER

Newton Country Day School

JAKOB WYMAN

Westfield High School

\$75 for the 75TH

Help us reach a future where every student is empowered through learning in science and engineering practices.



DONATE TODAY AND HELP US REACH MORE OF MASSACHUSETTS' YOUTH

Support our 75th year with a gift!

Whether \$7.50, \$75, \$750 or \$7,500, your contribution supports MSEF's efforts to engage more students in independent research across Massachusetts.



Our programming and student celebration and recognition is only possible because of financial support from like-minded individuals and organizations. Thank you!

MSEF is a non-profit 501(c)(3) organization.

Thank You Fair Sponsors

We extend our deepest appreciation to all our Fair Sponsors and Program Supporters, both long-standing champions and newcomers this year. Your unwavering dedication makes our year-round science fair programming possible. Your invaluable contributions enable us to nurture the curiosity and innovation of young minds, empowering them to explore, discover, and excel.

With your support, we are able to hold the State Fair, providing a platform for budding scientists and engineers to showcase their remarkable achievements and be recognized through the below awards. Together, we are inspiring the next generation of STEM leaders.

Thank you for your continued support and belief in the power of independent STEM research.

TITLE SPONSOR



GRAND AWARD



FIRST PLACE AWARD



ENGINEERING EXCELLENCE AWARD



COMPUTER SCIENCE & TECHNOLOGY EXCELLENCE AWARD



BIOSCIENCE EXCELLENCE AWARD



CHEMISTRY EXCELLENCE AWARD



SPECIALTY AWARDS



IN RECOGNITION OF

The Pauline J. LaMarche Memorial Award

Eisenstadt Memorial Award

Paul Parravano Memorial Award

The RNAi Revolution™ is disrupting disease and Alylam is leading the way

We're driven to transform the lives of people living with both rare and more common diseases through innovative science and continuous discovery. A passion for science is engrained in our RNA and that's why we're so proud to support the 2024 Massachusetts Science & Engineering Fair (MSEF).

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Proud to support Massachusetts Science & Engineering Fair and the 75th High School Fair



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Cabot Corporation is a leading global specialty chemicals and performance materials company. As a market leader, we continually extend the boundaries of what is possible, leveraging our team's expertise and the latest technology to create materials that deliver new levels of performance and efficiency.

We are a proud supporter of the Massachusetts Science & Engineering Fair and future STEM leaders.

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Gratitude to MSEF's Program Sponsors

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Davis Foundation



SUSTAINING MEMBERS



CONTRIBUTORS



MSEF's Board of Directors & Staff

MSEF is privileged to have the support of a talented, diverse, and enthusiastic Board of Directors. Your dedication to the success of MSEF is truly inspiring, and it is through your vision and guidance that we can empower young minds through transformative science fair programming.

Thank you for your invaluable contributions.

Board of Directors

EXECUTIVE COMMITTEE

Chair: Daniel Leibholz, *Analog Devices*

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Treasurer: Jeffrey Singer, *Corporate Director*

Secretary: Pooja Shukla Devendran, *NovoLux*

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Laurie Giandomenico, *MITRE*

Aaron Johnson, *Cabot Corporation*

Anne Ludes, *Massachusetts Academy of Math and Science*

Eddie Moreno, *CAMP4 Therapeutics Corp.*

MSEF Staff

Executive Director: Helen Rosenfeld

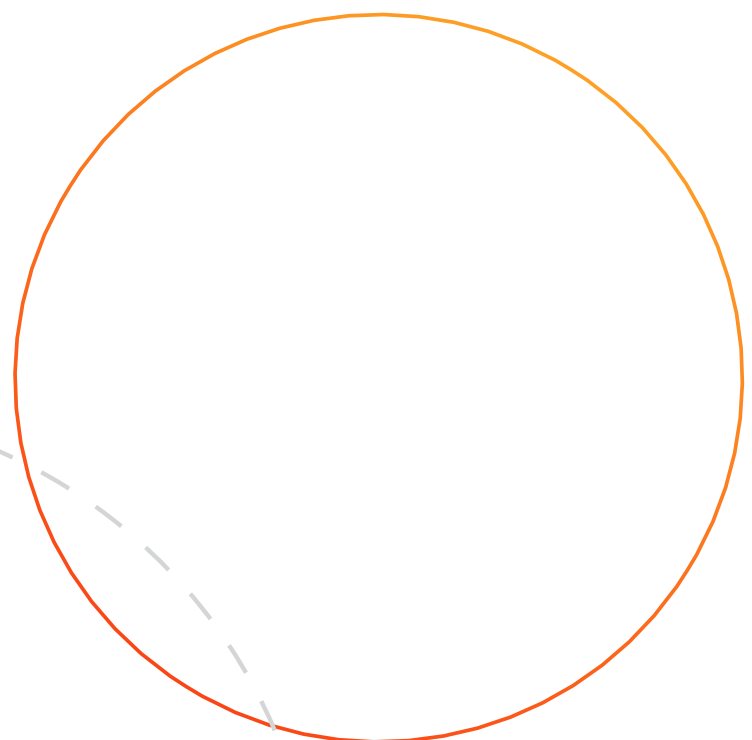
Program Director: Rebekah Stendahl

Senior Manager Of Administration: Elizabeth Kronberg

Events Manager: Karin Lebeau

Development Manager: Sarah Thomas

Student Programs Coordinator: Martha Johnson



student Symposium

MSEF 2024

Saturday, May 4th, 2024
10 AM - 3 PM
@ MIT Stratton Center

- Learn from STEM professionals through talks and discussion
- Meet other STEM oriented students from around Massachusetts
- Connect with STEM groups and universities from across the state

Celebrate learning and innovation at the Student Symposium!
Open to Science & Engineering fair students grades 9-12.

Questions?
info@scifair.com

Student Exhibitors

ADARME, ISABELLA

Using the B6Ei.LT-Y Mouse Model to Investigate the Contribution of Sex Chromosomes within the Kiss1+ Neurons of the Preoptic Hypothalamus*
Newton Country Day School

ADDANKI, PRANAV

Identifying a Novel, Inexpensive, and Noninvasive Biomarker for Fibromyalgia: Using Metabolomics, Genomics, and a Drosophila melanogaster Model
Canton High

AFZAL, IBRAHIM

Designing a Novel Aircraft Powered by an Innovative Electromagnetic-Accelerated Ionic Propulsion System
Methuen High

AFZAL, TAYYAB

Designing a Novel Aircraft Powered by an Innovative Electromagnetic-Accelerated Ionic Propulsion System
Methuen High

AGRAWAL, DEVAN

Words That Shape the World: A Novel Sentiment Analysis Approach to Quantifying Polarization from U.S. President Rhetoric on Immigration
Milton Adademy

AGRAWAL, KRITISHA

Revolutionizing Pain Relief: Sustainable and Controlled Delivery of Aspirin Using Biodegradable Microbeads for Enhanced Efficacy
Foxborough Regional Charter School

ALVES, MARIA

Acidity on Tooth Enamel Decay
Pioneer Charter School of Science II (PCSS-II)

ANAND, JIA

Ginsenoside Ck and RK1 Effects on High Intensity Behavioral Patterns of Aggression in a Taupathy Model of Alzheimers Disease in Drosophila Melongaster
St. Mark's School

ANDACIC, EMMA

Urbanizations Effect on Microplastics in Massachusetts Beaches
Billerica Memorial High School

ANGIRAS, VISHNU

Impact of Surface Conditions on the Magnus Effect
Tahanto Regional High

ARORA, AARYAN

Predictive Analysis of Sjögren's Syndrome: A Machine Learning Approach
Acton-Boxborough Regional High

ASHUN, MEGAN

Solar Powered UV-C LED Water Sterilizer
Massachusetts Academy of Math Science at WPI

ATALE, AARYA

The Effect of Organic Compost vs Non-Organic Compost on Phaseolus Lunatus Growth
Lexington High

AUBREY, YAZ

Is the Source of Dark Energy Time Dependent?
Falmouth Academy

BALLOU, JAMISON

Shuffle Science: Analyzing Machines, Riffles, and Algorithms in Card Shuffling
St. John Paul II High School

BAROUCH, SUSANNA

Antibody Responses to COVID-19 and Influenza Vaccines Administered on the Same Day or Different Days
Buckingham Browne Nichols School

BATEMAN, CHELSEA

The Efficacy of Duckweed in Mitigating Per- and Polyfluoroalkyl Substances (PFA/PFOS) on Daphnia Magna
Boston Latin

BATTISTA, MADELYNN

FeatherAI 2.0
Foxborough Regional Charter School

BHATIA, JAY

Identifying a Novel, Inexpensive, and Noninvasive Biomarker for Fibromyalgia: Using Metabolomics, Genomics, and a Drosophila melanogaster Model
Canton High

BHAWALKAR, ESHA

Improving Size Control Following Hydrothermal Synthesis Preparation of Carbon Quantum Dots
Newton North High

BISWAS, AYATI

Efficacy and Application of Used Coffee Grounds as Water Filters for Microplastics
Billerica Memorial High School

BLAIR, RYLEE

Assessing the Feasibility of Dawsonite Production as a Carbon Sequestration Strategy
Hopkinton High

BODANGI, SAMHITHA

Analyzing HLA sequences to Predict Organ Rejection and Find Targets for Precise Immunosuppression
Massachusetts Academy of Math Science at WPI

BOGUSLAVSKAYA, VICTORIA

The Effects of Vaping on the Inflammatory State of Macrophages in the Context of Infection
Pioneer Charter School of Science

BOLLEDDULA, JAHNAVI

Protecting Our Moms: An Early and Effective Detection of Preeclampsia
Lexington High

BOURQUE, ERIN

The Effect of Sunscreens on the Mortality Rate of Daphnia magna
Newton Country Day School

BOUYEA, LILY

Comparing Fire Extinguishing Solutions
Westfield High School

BOVE, ALEXANDER

The Optimal Analog Calculator
Bishop Feehan High School

BOYLE, JILLIAN

Measuring Water Toxicity with Daphnia Magna
St. John Paul II High School

BRUINOOGUE, NORA

Microplastics; A Threat Posed for Ocean Ecosystems Demonstrated by Sea Anemones
St. John Paul II High School

BUI, GRACE

Does Attractiveness Affect Your Criminal Justice Processing?
Pioneer Charter School of Science II (PCSS-II)

BULAN, LUKE

Designing an Economical Multi-Purpose Care Blanket for Neonates Continuation
Westfield High School

BULATEWICZ, LEO

Can the Bacteriophage Virus Successfully Eliminate E. Coli Bacterial Cultures?
West Springfield High

BUNGE, CHRISTIAN

Seagrass Wasting Disease's Effect On Eelgrass Under Environmental Stressors Such As Salinity
Center for Student Coastal Research

CAI, YUZE

SpinTOL: Research and Development of a Highly Efficient UAV
Concord Academy

CAMILLERI, MILANA

Utilizing the Kirby-Bauer Test To Ascertain the Effectiveness of Standard Healthcare Antibiotics for Respiratory Infections
Westfield High School

CANNING, FINN

Littleton Water Quality Study
Littleton High School

CARAMANICA, SOPHIA

Orthotic Hand Brace to Improve Range of Motion in Patients with Cerebral Palsy

Massachusetts Academy of Math Science at WPI

CASTILLO, ELIAS

From Waste to Fuel

Methuen High

CHATTERJEE, SOUMALYA

Can Ultrasound be Used as a Solution for Vision Impairment?

Sharon High

CHATURVEDI, GAYATRI

The Effect of Ocean Acidification on Seaweed Physiology

Falmouth High

CHAUHAN, GARIMA

Advanced Biosignature Detection Model For Finding Extraterrestrial Life using Capillary Electrophoresis

Hopkinton High

CHEN, JAYCE

Smart Care Shoes

Lawrence Academy

CHEN, JIUZHOU

Dancing with Math: Using Klein's Quartic for Music Generation

Deerfield Academy

CHEN, MICHELLE

Balance in Carbonate Convergent Waves

North Quincy High

CHEN, OLIVIA

Tiny Heroes of Resilience: Revealing Tardigrade Tolerance to High Glucose for Innovative Diabetes Treatments

Boston Latin

CHEN, RICHARD

Global Navigation Satellite Systems Observations of the Ionosphere During Strong Thermal Emission Velocity Enhancement

Andover High

CHEN, ZACHARY

Finding Early Dementia Predictors: Survival Analysis Utilizing Sleep Electroencephalogram and Blood-Based Biomarkers

Boston Latin

CHETTY, ARNAV

Using Clustering Algorithms to Predict Whether Phytochemicals are Cancerous or Anti-Cancerous

Acton-Boxborough Regional High

CHEUNG, ELMERIA

Decomposition of Different Bioplastics

North Quincy High

CHISHOLM-GODSHALK, TEAGAN

Sustainable Salads for Small Spaces: The Comparison of Lactuca sativa Growth Between Traditional Farming and Aeroponic Growing

Westfield High School

CLAUSEN, JULIETTE

Machine Learning Classification Using Neural Networks and Transfer Learning on CT Scans of 4 Lung Cancer Subtypes

Lexington High

COHEN, ROSE

Genetically Engineering Microorganisms and Biomanufacturing Enzyme Products

Minuteman Regional High

CONDON, MAEVE

Impact of Type and Morphology of MPs on the Regeneration Rates of Planaria

Bancroft School

COSGROVE, MOIRA

'Green' Sunscreen: How Eco-Friendly is Your Sunscreen?

Bishop Feehan High School

CRANE, CATHERINE

Biofilm Development on Bottle-Brush Electrodes for the Enhanced Reduction of Atmospheric Carbon Dioxide

Malden Catholic High School

CRAWFORD, MOLLY

Revolutionizing Menstrual Hygiene: A Green Approach with Reusable Tampons

Martha's Vineyard Regional High

CZYZEWSKI, STELLA

Does The Color Matter?

Westfield High School

DAGA, EKAUVLI

Microalgae: Nature's Solution to Oil Pollution

Wachusett Regional High

D'AIELLO, VICTORIA

Analyzing Amplitude Contrast in Water Containing Different Salinity Concentrations

Bristol-Plymouth Vocational Technical

DALAL, DAKSH

Automatic Waste Classification System

Westborough High

DAVIS, BENJAMIN

It's Not Rocket Science! The Effects of Varying Quantities of Water in Water Rocket Launch Altitude

Bishop Feehan High School

DAYASANKAR, MUKILAN

FeatherAI 2.0

Foxborough Regional Charter School

DEFILIPPO, LUCAS

Modular OLED Infrared Digital Night Vision Goggles for Critical Search and Detection in Underdeveloped Countries

Weston High

DENG, MARY

A Novel Multivariate Framework for Precision-Driven Oncogenic Pathway Disruption and Targeted Therapeutics Innovation

Boston Latin

DENNY, KYLE

Biochar's Potential for Mitigating Climate Change

Brockton Public Library

DING, SAMUEL

OncoGPT: An AI Assistant for Genomic-Driven Precision Oncology

Lexington High

DING, YIFAN EVAN

Engineering a Termination Readthrough-Based Gene Switch Enables Controllable CRISPR Gene Editing

Boston Latin

DING, YIMING

Three-Pronged Approach to Investigating the Development of Novel Inhibitors Targeting KRAS G12C in Lung Cancer

Berkshire School

DONOVAN, MAX

Determining the Sustainability of Different Wood Pellet Types

Falmouth Academy

DUFFY, BRENNAN

Relation Between Nuclear Power Plants and Childhood Cancer Deaths

Sturgis Charter Public School

DUPEE, MIA

The Effect of Sugar on the Brain

Winchester High School

ECONOMOU, EFTALIA

Remediating Oil-Contaminated Soil in Rural Colombia by Using Bacillus Subtilis for Sustainable Crop Growth

Bancroft School

ELBER, JAIDEN

Producing a Biofuel From Peanut Shells

Falmouth Academy

ERBAS, TIMUCIN

Higher Efficiency Dynamic Rocket Engine Nozzle

Acton-Boxborough Regional High

EVANS, SUSAN

Chemical Profiling of the Triglycerides in Two Species of Microalgae Using a Green Extraction Method

North Quincy High

FALL, NDIOMA

Remediating Oil-Contaminated Soil in Rural Colombia by Using Bacillus Subtilis for Sustainable Crop Growth

Bancroft School

FARRUQUI, SIMON

Words That Shape the World: A Novel Sentiment Analysis Approach to Quantifying Polarization from U.S. President Rhetoric on Immigration

Milton Adademy

FERNALD, MAXWELL

Seagrass Wasting Disease's Effect On Eelgrass Under Environmental Stressors Such As Salinity

Center for Student Coastal Research

FINDLEN, JULIET

Algae Fertilizer: Efficiency and Biosorption of Copper by Chlorella Vulgaris

Hopkinton High

FLORES, MYLES

The Accuracy of AI Generated Text Detectors at Detecting AI Generated vs Human Written Content

Bishop Feehan High School

FOUDA, LILYA

Eggstraordinary Decay: A Comparative Analysis of Various Types of Drinks on Eggshell as a Model for Tooth Enamel

North Attleboro High

FRYE, MELANIA

Extend The Language of Love

Mashpee High

FUJIMOTO, CARINA

The Impact of Sleep Deprivation on Cognitive Performance Among Female Middle and High School Students

Newton Country Day School

GEDUTIS, MOLLY

Testing Pesticide Resistance, Avoidance, and Efficacy in Mosquito Populations on Cape Cod

Dennis-Yarmouth Regional High

GIRISH, MADHAV

Predictive Analysis of Sjögren's Syndrome: A Machine Learning Approach

Acton-Boxborough Regional High

GIZA, NICHOLAS

A Novel Water-based Cooling Approach to Increase Solar Panel Efficiency

Massachusetts Academy of Math Science at WPI

GOEL, AADYA

Can Antidepressants Reduce the Risk of Psoriasis?

Acton-Boxborough Regional High

GONNEEA, TALEENA

Observing the Effect of Microplastics on Zebrafish Macrophages

Falmouth Academy

GOULETTE, KAITLYNN

The Effects of LED Lighting on Painted Lady Butterflies

Westfield High School

GUESSAB, KAIS

First Animal Study On Novel Drug Candidates Targeting Alzheimer's

Hopkinton High

GUNDU, KRUTHI

Investigating Genetic Variability in Amyotrophic Lateral Sclerosis to Identify Patient-Specific Treatment with Antioxidants

Massachusetts Academy of Math Science at WPI

GUNNING, GRACE

Optimizing UV-C Photosynthesis: Accelerating Crop Growth for Global Food Security

Malden Catholic High School

GUO, DANIEL

The Relationship Between Social Media and High Schooler Mental Health and the Efficacy of AI Models in Predicting Stress Levels among High School Students Using Social Media Posts

St. Mark's School

GUO, DAVID

Redefining Inflation Forecast: A New Holistic Approach to Analyze Structural and Economic Policy Drivers with Deep Learning

Buckingham Browne Nichols School

GUPTA, AANYA

A Novel In vitro Co-culture System of Primary Human Adipocytes and Primary Murine Cortical Neurons

Shrewsbury Sr High

GUPTA, ARNAV

Color Blindness

North Attleboro High

GUYOTT, BRANDON

Designing a Prototype of an After-market Motorized Window Opener

Westfield High School

HANECHAK, ELIZABETH

Solving Our Planet's Plastic Problem: Developing a Biological System That Turns Toxic Waste Into Drinkable Water and Fertilizer

Pope Francis Preparatory School (Springfield)

HANSON, DASHIELL

Artificial Endocrine System

Lowell High

HE, XI

Alkylammonium Modified Photosensitizers Achieve Lysosome-Precision Photodynamic Therapy: Implications from Molecular Dynamics Simulations

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Weston High

WU, YUYAO

Bionic Insect Jumping Device

Thayer Academy

XIANG, STEVEN

Comparison of Pest Resistance in Crops with Natural and Artificial Priming

Bancroft School

XIE, EVAN

Computational and AI-Assisted Design of Dual-Metal Single-Atom Catalyst for Oxygen Reduction Reaction

Deerfield Academy

XUE, WEIAN

Concentration-Dependent Efficacy of the Traditional Chinese Medicine Fructus Mume on the Inhibition of Escherichia coli K12 Growth

Boston Latin

YADAV, PALAK

A Novel Deep Learning Pipeline to Noninvasively Detect and Treat Gynecologic Diseases Using MiRNA Expression and In Silico Modeling

Massachusetts Academy of Math Science at WPI

YAN, ETHAN

ALlocate: A Low-Cost Automatic Artificial Intelligence System for the Real-Time Localization and Classification of Acute Myeloid Leukemia in Bone Marrow Smears

Groton School

YANG, KAIWEI

Comparison of Accuracy and Carbon Emission of U-Net Variations Across Various Optimizers and Loss Functions

Deerfield Academy

YANG, KATELYN

Ancestral Microbiota and Associated Microbial Metabolites Effect on Gut Health During Recovery of Anorexia Nervosa

St. Mark's School

YAO, LILY

Flood Dataset Augmentation with DCGAN

Miss Hall's School

YEMINI, FINN

Seagrass Wasting Disease's Effect On Eelgrass Under Environmental Stressors Such As Salinity

Center for Student Coastal Research

YOO, CHRISTOPHER

Machine Learning Approaches to Enhance Inverse Kinematics in Robotics

Noble And Greenough School

ZAKI, BILAL

Assessing Student Proficiency with AI and Evaluating AI Detectors

Al Noor Academy

ZHANG, LARRY

Analysis of Gene Expression in Cell Lines with Altered VPS35 Gene Expression

Belmont High

ZHANG, MEGAN

Global Navigation Satellite Systems Observations of the Ionosphere During Strong Thermal Emission Velocity Enhancement

Andover High

ZHANG, MENG MENG

Phosphate-Caffeine Buffer (PBS) Inhibits Exocytosis and Increases the Yield of Fungal 1,3-β-d-Glucan (BDG) Biomarker Detection Reagent, Limulus Amebocyte Lysate (LAL)

Westford Academy

ZHANG, SOPHIA

Phosphate-Caffeine Buffer (PBS) Inhibits Exocytosis and Increases the Yield of Fungal 1,3-β-d-Glucan (BDG) Biomarker Detection Reagent, Limulus Amebocyte Lysate (LAL)

Westford Academy

ZHANG, YUXUAN

Heavy Metal Analysis of Lichen Samples at Lower Neponset River Reveals Previously Overlooked Contamination

Boston Latin

ZHAO, QINGHE

The Effect of Fire on the Amount of Chlorophyll in Pine Tree Needles

Boston Latin

ZHENG, YULIN

Modulation of Cellular Senescence by Short-Chain Fatty Acids

Cushing Academy

ZHONG, ZHIYANG

Predictions of Massachusetts Coastal Vertebrate Biodiversity under Global Warming and Ocean Acidification Based on CMIP5 Models

Tabor Academy

ZHOU, LIXIAN

A Launchable Aerial and Underwater Rotorcraft Robot

Northfield Mount Hermon School

ZHOU, XINYUAN (YOLANDA)

Using Inverted Airfoils to Reduce Conical Vortex-Induced Uplift on Residential Buildings

St. Mark's School

ZHU, RUICHEN

Secure Code Generation with Large Language Models

Berkshire School

ZHU, SHUTING

Gravitropism in Microgravity: Simulating the Effects of Constant Rotation on Plant Germination using Arduino Clinostat

O'Bryant School Math/Science

ZHU, YUJIANG

Using an AI Equipped Drone for Early Detection of Fires

Westborough High

ZINK, JAKE

Artificial Endocrine System

Lowell High

MSEF

Massachusetts Science
+ Engineering Fair

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