

## The 2021 Hawaii State Science & Engineering Fair

### SR Division Best in Category

SR – ANIMAL SCIENCES (ANIM)		
<b>1<sup>ST</sup> Place</b>	Kellen A. Kamehameha Schools, Kapālama	ANIM-0337 “An Inventory of Forest Birds Along the Aiea Loop Trail, O‘ahu, Hawai‘i”
<b>2<sup>ND</sup> Place</b>	James S. Pearl City High School	ANIM-0176 “Effect of Oxybenzone on Artemia salina”
<b>3<sup>RD</sup> Place</b>	Megan N. Waiākea High School	ANIM-0120 “The Hawaiian Intertidal: Assessing Algae and Invertebrate Species Abundance Across O‘ahu”

SR – BEHAVIORAL & SOCIAL SCIENCES (BEHA)		
<b>1<sup>ST</sup> Place</b>	Kailani I. Baldwin High School	BEHA-0157 “How Does Mindfulness Meditation Affect Teens”
<b>2<sup>ND</sup> Place</b>	Aubrey D. Iolani School	BEHA-0031 “Music in Film”
<b>3<sup>RD</sup> Place</b>	Angeline C. / Juliet M. Kauai High School	BEHA-0231 “Teenagers’ Mental Health vs. the COVID 19 Epidemic”

SR – BIOCHEMISTRY (BCHM)		
<b>1<sup>ST</sup> Place</b>	Maya O. Hilo High School	BCHM-0411 “Investigating the Biochemical Activity of Organic Curcuma caesia and Curcuma longa (Turmeric) on Neuroblastoma Cancer Cells”
<b>2<sup>ND</sup> Place</b>	Alexis D. Mililani High School	BCHM-0408 “Natural and Sustainable Sunscreen and Its Ability to Degrade in Saltwater”

SR – BIOMEDICAL & HEALTH SCIENCES (BMED)		
<b>1<sup>ST</sup> Place</b>	Logan L. Kamehameha Schools, Kapālama	BMED-0094 “Testing Fabric and Mask Particle Filtration Efficacy”
<b>2<sup>ND</sup> Place</b>	Zachary Jordan G. Iolani School	BMED-0149 “The Influence of Water Heater Temperature on the Quantity and Pathogenicity of Nontuberculous Mycobacteria Found in Water Heater Sediment in Hawaii”
<b>3<sup>RD</sup> Place</b>	Sean C. Iolani School	BMED-0492 “Investigating the Effects of Supplements on Diversity of Peripheral TCR-beta CDR3 Repertoire Between Teenage Brothers”

**SR – BIOMEDICAL ENGINEERING (ENBM)**

<b>1<sup>ST</sup> Place</b>	Connor L. Iolani School	ENBM-0210 “The Future of Prosthetics”
<b>2<sup>ND</sup> Place</b>	Alara B. Seabury Hall	ENBM-0209 “Biomedical Engineering CAD and the Design Process of Medical Implants and Devices”
<b>3<sup>RD</sup> Place</b>	Bryce J. / Maris J. Kailua High School	ENBM-0349 “Designing a COVID Regulated Face Mask to Prevent the Growth of Masons Mask Acne”

**SR – CELL & MOLECULAR BIOLOGY (CELL)**

<b>Honorable Mention</b>	Mana H. Roosevelt High School	CELL-0230 “Genetically Modifying the Atherogenic Lipoprotein Phenotype (ALP) Through the Utilization of CRISPR-Cas9 to Reduce the Risk of Atherosclerosis”
--------------------------	----------------------------------	---

**SR – CHEMISTRY (CHEM)**

<b>1<sup>ST</sup> Place</b>	Alanna S. Waiākea High School	CHEM-0315 “Column Purification of Hawaiian Grown Mamaki Tea Extract and Investigation of Association Compound Stability in Simulated Intestinal and Gastric Fluids”
<b>2<sup>ND</sup> Place</b>	Emmaleigh S. Kalaheo High School	CHEM-0273 “Removing Pesticides Found in Fruits and Vegetables”
<b>3<sup>RD</sup> Place</b>	Kiana E. Kalani High School	CHEM-0360 “Compound Effectiveness of Removal of Heavy Metals in Water”

**SR – COMPUTATIONAL BIOLOGY & BIOINFORMATICS (CBIO)**

<b>1<sup>ST</sup> Place</b>	Jiacheng D. Iolani School	CBIO-0205 “An AI-aided Solution to Open-Angle Glaucoma Screening in Developing and Rural Countries”
<b>2<sup>ND</sup> Place</b>	Emily P. Waipahu High School	CBIO-0531 “In silico Screening and Analysis of Inhibitory, Anti-Prion Ligands for Prevention of Pathogenic Prion Conversion”
<b>3<sup>RD</sup> Place</b>	Noah C. Punahou School	CBIO-0475 “Analysis and Comparison of SARS-CoV-2 Mutations to Viral Capabilities”

**SR – EARTH & ENVIRONMENTAL SCIENCES (EAEV)**

<b>1<sup>ST</sup> Place</b>	Kai M. Kauai High School	EAEV-0577 “Using GIS to Locate Native Species Habitat and their Future Refugia Based on SLRXA (Sea Level Rise Exposure Area)”
<b>2<sup>ND</sup> Place</b>	Ashlynn C. Mililani High School	EAEV-0099 “Investigating the Effects of Salinity on the Invasive Plant Species Ipomoea aquatica through Growth Carbon Sequestration and Histology”
<b>3<sup>RD</sup> Place</b>	Aidan G. / Joe P. Kauai High School	EAEV-0572 “An Analysis of Sea Level Rise Predictions and Relations to Density and Polar Ice Cap Volume Fluctuations”

**SR – EMBEDDED SYSTEMS (EBED)**

<b>1<sup>ST</sup> Place</b>	Lana L. Kalani High School	EBED-0373 “No CoVID Past This Point Non Contact Vital Sign Detection”
<b>2<sup>ND</sup> Place</b>	Braden L. Iolani School	EBED-0494 “Development and Analysis of Low Cost Wireless Flash Memory Devices”

**SR – ENERGY SUSTAINABLE MATERIALS & DESIGN (EGSD)**

<b>1<sup>ST</sup> Place</b>	Tyler M. Iolani School	EGSD-0544 “Creation of a Novel Lichen for Biofuel Production”
<b>2<sup>ND</sup> Place</b>	Colby S. Mililani High School	EGSD-0024 “Effect of Lactobacillus acidophilus Concentration on the Voltage Output of a Microbial Fuel Cell”
<b>3<sup>RD</sup> Place</b>	Ariel M. Iolani School	EGSD-0072 “Harvesting Energy from Natural Evaporation with Nanomaterials”

**SR – ENGINEERING MECHANICS (ENMC)**

<b>1<sup>ST</sup> Place</b>	Antonio V. / Lauren S. Pearl City High School	ENMC-0542 “Improving Autonomous Underwater Vehicle AUV Glider Efficiency Wingspan”
<b>2<sup>ND</sup> Place</b>	Julianne Ysabella V. Waipahu High School	ENMC-0057 “Designing a Small Scale Natural Cooling System in Tropical Climates”
<b>3<sup>RD</sup> Place</b>	Kailee O. Kauai High School	ENMC-0191 “Creating Traffic Wind Turbine Model”

**SR – ENVIRONMENTAL ENGINEERING (ENEV)**

<b>1<sup>ST</sup> Place</b>	Andrew D. / Ethan H. / David T. Iolani School	ENEV-0487 “Managing Oysters to Maintain our Islands MOMI”
<b>2<sup>ND</sup> Place</b>	Kai R. Mililani High School	ENEV-0602 “Using Fruit Remnants as Biofilters for Water Purification”
<b>3<sup>RD</sup> Place</b>	Flora T. / Ava T. Waipahu High School	ENEV-0237 “Using Magnetism to Clean Up Oil Spills”

**SR – MATERIAL SCIENCES (MATS)**

<b>1<sup>ST</sup> Place</b>	Kelly M. Iolani School	MATS-0069 “Engineering an Invasive Algae and Taro Based Bioplastic”
<b>2<sup>ND</sup> Place</b>	Jeyan Francis C. Waipahu High School	MATS-0164 “Synthesizing c-Si <sub>3</sub> N <sub>4</sub> from Extreme Temperature and Pressure Conditions”
<b>3<sup>RD</sup> Place</b>	Joshua L. University Laboratory School	MATS-0019 “Bioplastics: Beautiful or Bunk?”

**SR – MATHEMATICS (MATH)**

<b>Honorable Mention</b>	Jeein H. Iolani School	MATH-0165 “Developing a Neural Network Model of the Total Honey Bee Colony Loss”
--------------------------	---------------------------	---

**SR – MICROBIOLOGY (MCRO)**

<b>1<sup>ST</sup> Place</b>	Cade K. Kamehameha Schools, Kapālama	MCRO-0134 “The Effect of a Mycorrhizal Fungus on Endemic, Indigenous, and Non-Native Plant Species in Hawai‘i”
<b>2<sup>ND</sup> Place</b>	Lela D. Waiākea High School	MCRO-0111 “Structural Deduction and Environmental Analysis of Novel Tirofiban and Coumarin Derivative Originating from the Endophytic Isolate FM1005 ( <i>Xylaria</i> sp.)”
<b>3<sup>RD</sup> Place</b>	Ayana S. Roosevelt High School	MCRO-0159 “Identifying the Role of Alternative Ribosomal Proteins in Antibiotic Tolerance”

**SR – PHYSICS & ASTRONOMY (PHYS)**

<b>1<sup>ST</sup> Place</b>	Stephanie Y. Punahou School	PHYS-0229 “Determining the Detectability of Planets Transiting Stars of Extragalactic Origin”
<b>2<sup>ND</sup> Place</b>	Edward D. King Kekaulike High School	PHYS-0594 “How Big is an Asteroid?”
<b>3<sup>RD</sup> Place</b>	Anica A. Baldwin High School	PHYS-0180 “Observation of a Tidal Disruption Event in AT2019rnu”

**SR – PLANT SCIENCES (PLNT)**

<b>1<sup>ST</sup> Place</b>	Ynamariah L. Campbell High School	PLNT-0075 “Bilimbi Fruit and Mealy Bugs”
<b>2<sup>ND</sup> Place</b>	Teah T. Mililani High School	PLNT-0082 “Effect of Different Soil Agents on Soil Quality of Potatoes ( <i>Solanum tuberosum</i> )”
<b>3<sup>RD</sup> Place</b>	Kai K. Kailua High School	PLNT-0038 “Natural Farming Fermented Seawater Formula to Increase Sugar Content in Plant Produce”

**SR – ROBOTICS & INTELLIGENT MACHINES**

<b>1<sup>ST</sup> Place</b>	Natalie K. Kaiser High School	ROBO-0581 “Utilizing AI to Reduce the Risk of SIDs”
<b>2<sup>ND</sup> Place</b>	Jaxon P. Roosevelt High School	ROBO-0027 “Artificial Intelligence for Disaster Recovery”
<b>3<sup>RD</sup> Place</b>	Katelyn L. / Kestan K. Iolani School	ROBO-0469 “Innovating an Autonomous Delivery Car”

**SR – SYSTEMS SOFTWARE (SOFT)**

<b>1<sup>ST</sup> Place</b>	Roan W. Kalaheo High School	SOFT-0269 “Using Public-Key Cryptography to Advance and Secure the Voting Process”
<b>2<sup>ND</sup> Place</b>	Reyan L. / Brycen A. Waipahu High School	SOFT-0558 “Designing an Effective Physical Therapy App”
<b>3<sup>RD</sup> Place</b>	Kyla L. Kalani High School	SOFT-0361 “You’ve Probably Been Hacked Already! How Social Engineering Can Blow Up Cyber Security”

**SR – TRANSLATIONAL MEDICINE (TMED)**

<b>1<sup>ST</sup> Place</b>	Rachel T. Waiākea High School	TMED-0352 “Identification of a Novel Anticancer Pathway in a Traditional Hawaiian Herb”
<b>2<sup>ND</sup> Place</b>	Blaise S. Mililani High School	TMED-0412 “High Accuracy Classification of Myopathy and Normal Electromyography Signals Using ResNet50 Neural Network”
<b>3<sup>RD</sup> Place</b>	Emma B. Kauai High School	TMED-0138 “The Effect of Ventilation and Air Filtration on the Distribution of Airborne Droplets and Aerosols”