

64th Annual GSDSEF Award Winners Senior Division

| Place Award | Category                       | Student Name                      | Project Name  | School Site              | Advisor     |
|-------------|--------------------------------|-----------------------------------|---|--------------------------|-------------|
| First Place | Animal Sciences                | Mary Jasmine Lara                 | The Effect of Voltage of Planarian Neoblasts  | Olympian High            | L. More     |
| First Place | Behavioral and Social Sciences | Charlie Gracia and Vanessa Lopez  | Time Management on Students' G.P.A  | Central Union Hgh        | L. Rueda    |
| First Place | Biochemistry                   | Sophia Chen                       | NLRP3 Inflammasome Uptake in Stellate Cells and Effects on Activation   | Torrey Pines High School | J. Newman   |
| First Place | Biochemistry                   | Helen Cho                         | Functionality of TBP Non-conserved Region in Formation of SNAPc-TBP-Bdp1 Complex                                  | Canyon Crest Academy     | A. Haas     |
| First Place | Biochemistry                   | Sumanth Gurram and David Wu       | The Effects of Low-Frequency EMFs on Cancer Cell Viability  | Westview High            | S. Halander |
| First Place | Biochemistry                   | Aida Razavilar                    | Employing Exosomes as a Novel Diagnostic and Prognostic Measure through EGFR and RNA Monitoring in Plasma Derived | Canyon Crest Academy     | A. Haas     |
| First Place | Biochemistry                   | Aadil Rehan and Reva Agashe       | Plaque Attack: Is Mitochondrial Interference from Amyloid Precursor Protein a Cause of Alzheimer's?               | Canyon Crest Academy     | A. Haas     |
| First Place | Biochemistry                   | Julia Situ                        | Identification and Functional Characterization of Circular RNAs in Drosophila                                     | Canyon Crest Academy     | A. Haas     |
| First Place | Chemistry                      | Taraneh Barjesteh                 | Photo-induced Degradation of Porous Silicon via a Redox Active Etchant  | Canyon Crest Academy     | A. Haas     |
| First Place | Chemistry                      | Andre Yin                         | A Novel Approach to Increasing the Permeability of Desalination Membranes   | Westview High            | S. Halander |
| First Place | Computer Science               | Ilan Cosman                       | Computer Vision for Detecting Errors in 3D Printing   | La Jolla High            | M. Stuart   |
| First Place | Computer Science               | Paul Gauvreau                     | Built by Blockchain: a universal api for non native cross chain smart contracts                                   | Canyon Crest Academy     | A. Haas     |
| First Place | Computer Science               | Andreas Moldskred                 | CoinHive-Blocker  | Olympian High            | T. Claudio  |
| First Place | Computer Science               | William Sun and Harris Beg        | Skin Disease Recognition Via Deep Learning Algorithm  | Canyon Crest Academy     | A. Haas     |
| First Place | Computer Science               | Sahithy Yaramada                  | Novel image segmentation approach for the detection of malarial parasitic cells in blood smear images             | Canyon Crest Academy     | A. Haas     |
| First Place | Engineering - Electrical and   | Yusuf Amanullah                   | A Smart Heart Monitoring System to Assist in Detecting Cardiovascular Abnormalities                               | Mt. Everest Academy      | T. Pachon   |
| First Place | Engineering - Electrical and   | Ronak Roy                         | Smartphone-Controlled Portable Phoropecter Powered by Variable Focal Length Liquid Lens                           | Canyon Crest Academy     | A. Haas     |
| First Place | Engineering - Electrical and   | Suraj Srinivasan and Rakesh Reddy | Low Cost 3D-Printable Modular Prosthetic Hand with Active Control   | Francis Parker School    | R. Hanscom  |

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|-------------|------------------------------------|------------------------------------|---|----------------------------------|--------------|
| First Place | Engineering - Electrical and       | Daniel Sun                         | METBIND: An Artificial Intelligence Approach to Metal Binding Site Prediction in Metalloproteins                                  | Canyon Crest Academy             | A. Haas      |
| First Place | Engineering - Energy and Transport | Ken Lew                            | Graphene Oxide Advancement in Technology: Nanoparticle Application in Carbon Fiber Aircraft Design                                | La Jolla Country Day School      | D. Padgett   |
| First Place | Engineering - Materials and        | Isabella Catanzaro                 | Heat Transfer Optimization for Home Insulation  | Cathedral Catholic High          | M. Rafie     |
| First Place | Engineering - Materials and        | Saeyeon Ju                         | New Visualization and Analysis Approaches using 3D Electron Microscopy and 3D Printing Technologies: Studies of Optic Glioma      | Scripps Ranch High               | E. Gillum    |
| First Place | Engineering - Materials and        | Remy Reeb                          | Reducing the Incidence of Scald Burns in Children (Age Five & Under)  | Cathedral Catholic High          | J. Lopatka   |
| First Place | Environmental Sciences and         | Laura Krasnow                      | Biodegradation of Low-Density Polyethylene by Marine Bacteria   | Canyon Crest Academy             | A. Haas      |
| First Place | Environmental Sciences and         | Alfred Vargas and Audrey Vargas    | Solar Desalination Using a Parabolic Trough   | Sweetwater High                  | S. Sandoval  |
| First Place | Mathematical Sciences              | Rachana Madhukara                  | Asymptotics of Character Sums   | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Eden Deng                          | Molecular Changepoints in the Aging Human Brain   | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Saikumar Gantla                    | Pharmaceutical Drug Mapping: Novel and Effective Tool for Clinical Applications   | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Philippe Hansen-Estruch            | A microbiome approach to treat Galactosemia, a life-threatening genetic disorder  | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Allen Huang                        | Targeting eIF4A4 by RNA Interference: A New Strategy for Breast Cancer Therapy  | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Andrea Liu                         | Repurposing AZD4547 for Neuroblastoma   | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Judy Qin                           | Genes Related to Melanoma Displaying the Ultraviolet Signature Mutation   | Canyon Crest Academy             | A. Haas      |
| First Place | Medicine and Health Sciences       | Kaitlyn Wang and Ruchi Agashe      | Effects of Interferons on Prostate Cancer Aggressiveness  | Canyon Crest Academy             | A. Haas      |
| First Place | Microbiology                       | Ji Hyun Lee and Cynthia Chen       | Repurposing and combining therapies to find better treatment for leishmaniasis  | Canyon Crest Academy             | A. Haas      |
| First Place | Microbiology                       | Joonhyuk Lee                       | Conquering Antibody-Dependent Enhancement: Structurally Guided Identification of Strong Cross-Neutralization Inducing Epitopes on | Scripps Ranch High               | V. Reddy     |
| First Place | Physics and Astronomy              | Isaac A Broudy                     | Testing Special Relativity with High Resolution Differential Photometry of Eclipsing Binary Systems                               | Bonita Vista High                | M. Mardahl   |
| First Place | Physics and Astronomy              | Bianca Monique Luansing and Jannie | Parametric Studies of Plasma Detachment in a Linear Magnetized Device   | San Diego High/Canyon Crest Acad | M. Robertson |

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|--------------|------------------------------------|--------------------------------|---|-------------------------|----------------|
| First Place  | Physics and Astronomy              | Vivek Vijayakumar              | The Structure of Fibrils and Filaments on the Solar Chromosphere                              | San Marcos High         | R. Terrill     |
| First Place  | Physics and Astronomy              | Andy Zhu                       | Moth Eye Anti-Reflective Coating for Near-Infrared Astronomical Applications                  | Canyon Crest Academy    | A. Haas        |
| First Place  | Plant Sciences                     | Alina Pollner                  | Novel Strategy to Increase Fruit Production via CRISPR-Cas9 Genome Editing                    | Canyon Crest Academy    | A. Haas        |
| First Place  | Plant Sciences                     | Emily Tianshi                  | Microscopic Study of Torrey Pine Needles For Moisture Condensation                            | The Cambridge School    | M. Gingrich    |
|              |                                    |                                |   |                         |                |
| Second Place | Animal Sciences                    | Kylie Konyn                    | Predicting the Future   | St. Joseph Academy      | R. Hanson      |
| Second Place | Biochemistry                       | Sahana Kumar                   | Visualization and Modeling of the CaMKII- $\delta$ Signaling Network in Cardiac Cells         | Francis Parker School   | K. Wimpey      |
| Second Place | Biochemistry                       | Vainavi Viswanath and Benjamin | Evaluating the Effects of A211D and A211T Mutants on PKA                                      | Canyon Crest Academy    | A. Haas        |
| Second Place | Chemistry                          | Mitali Juneja                  | Artificial Sweetener to Butanol: Using Aspartame for a More Practical Biofuel Solution        | Canyon Crest Academy    | A. Haas        |
| Second Place | Computer Science                   | Kevin Lopatka                  | Optimization in Training of Convolutional Neural Networks                                     | Cathedral Catholic High | J. Lopatka     |
| Second Place | Computer Science                   | Adithya Rao                    | Smart Glove - American Sign Language (ASL) Fingerspelling to Speech Translator                | Canyon Crest Academy    | A. Haas        |
| Second Place | Computer Science                   | Dustin Wu                      | Analysis of Twitter: What Hashtags and What Retweets Get Broadcasted?                         | Pacific Ridge           | R. Mudaliar    |
| Second Place | Engineering - Electrical and       | Amanda Cantwell                | Piano Stairs  | Central Union High      | L. Rueda       |
| Second Place | Engineering - Electrical and       | Francisco Catanzaro            | Bending Stress Forces in Bipedal Locomotion   | Cathedral Catholic High | S. Pena        |
| Second Place | Engineering - Electrical and       | Nicolas Enriquez               | A Multi-Purpose, Non-Invasive Vital Sign Monitor  | Canyon Crest Academy    | A. Haas        |
| Second Place | Engineering - Energy and Transport | Dina Dehaini                   | Researching Instability of Organic Solar Cells by Photodegradation and Preventative Solutions | Islamic School of SD    | N. NasserIddin |
| Second Place | Engineering - Energy and Transport | David Gillcrist                | The Potential Energy of Different Cordages  | Mt. Everest Academy     | N. Negus       |
| Second Place | Engineering - Energy and Transport | Zachary Schremmer              | Greenhouse Stirling Engine  | University City High    | M. Quessenberr |
| Second Place | Engineering - Materials and        | Heidi Rabe                     | The Trumpet Player's Personal Practice Device   | Central Union High      | L. Rueda       |

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|--------------|------------------------------|-------------------------------------|--|-----------------------|-------------|
| Second Place | Engineering - Materials and  | Shreya Ranganath                    | Boron Carbide Coated in Situ Reinforced Titanium Matrix Composite  | Bonita Vista High     | M. Mardahl  |
| Second Place | Engineering - Materials and  | Richa Singh                         | Heat Stroke Detection and Prevention   | Scripps Ranch High    | E. Gillum   |
| Second Place | Environmental Sciences and   | Emma Rand                           | Using Water Hyacinth as a Tool in the Bioremediation of Nitrate Pollution  | Bonita Vista High     | M. Mardahl  |
| Second Place | Environmental Sciences and   | Savannah Groom Castillo and Timothy | The Effect of Fertilizer on Water Snails   | Bonita Vista High     | M. Mardahl  |
| Second Place | Mathematical Sciences        | Gilbert Neuner                      | Legal States of the Rubik's Cube   | Bonita Vista High     | M. Mardahl  |
| Second Place | Medicine and Health Sciences | Niki Hosseinian                     | The Synergistic Effects of Ellagic and Ascorbic Acids on Cancer Cell Proliferation                                   | Canyon Crest Academy  | A. Haas     |
| Second Place | Medicine and Health Sciences | Angela Liu                          | Function of Fbxw7 in lung epithelium cell differentiation in postnatal mice  | Torrey Pines High     | J. Newman   |
| Second Place | Medicine and Health Sciences | Kiana Nava                          | The Impact of Gender on Glaucoma in Mus musculus   | Central Union High    | L. Rueda    |
| Second Place | Medicine and Health Sciences | Alexis Negrete and Nohemi Anderson  | Smell Test for Alzheimer's   | Central Union High    | L. Rueda    |
| Second Place | Medicine and Health Sciences | Emily Nguyen                        | Effects of Dietary Supplements on Neuroregeneration in Dugesia Tigrina   | Mt. Everest Academy   | T. Pachon   |
| Second Place | Medicine and Health Sciences | Umit Suri                           | The Incidence, Risk Factors, and Outcomes of Pneumothorax in Preterm infants   | Francis Parker School | R. Hanscom  |
| Second Place | Medicine and Health Sciences | Daniel Zhang                        | Transforming Rod to Cones: An Intein-based gRNA/Split-Cas9 system for Retinal Architecture Reconstruction and Vision | Westview High         | M. Ingram   |
| Second Place | Medicine and Health Sciences | Aaron Zhao                          | Kinetics Study of Hemolysis: Evaluation of the Hemolytic Strength of Lytic Reagents                                  | Canyon Crest Academy  | A. Haas     |
| Second Place | Medicine and Health Sciences | Justin Wang                         | A Novel Approach to Cancer Immunotherapy: The Effect of Epigenetic Inhibition on Polarized Macrophages.              | Canyon Crest Academy  | A. Haas     |
| Second Place | Microbiology                 | Megan Esmeralda Badea               | The Isolation and Identification of Antimicrobial Properties in Leptospermum Scoparium and Local Honey               | Eastlake High         | C. Bayley   |
| Second Place | Microbiology                 | Isabella Vierling                   | Synergistic Effects of Ag, Cu, and Zn NPs Against E. coli  | Canyon Crest Academy  | A. Haas     |
| Second Place | Physics and Astronomy        | Fenna Candy                         | Influence of Viscosity on Tampon Absorbency  | Mt. Everest Academy   | R. Pachon   |
| Second Place | Plant Sciences               | Jordi Bertran                       | The Burning Question: Is Biochar an effective soil amendment in drought regions                                      | Pacific Ridge         | R. Mudaliar |
|              |                              |                                     |  |                       |             |

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|-------------|------------------------------------|--|---|----------------------------------|---------------|
| Third Place | Animal Sciences                    | Aurora Czajkowski and Sarah            | The Effect of Eucalyptus Oil on the Behavior of Mealworms                             | Bonita Vista High                | M. Mardahl    |
| Third Place | Behavioral and Social Sciences     | Alondra Mojica and Ashley Mendiola     | Ability to See Multiple Perspectives: Adolescents vs Adults                           | King Chavez Community HS         | D. Munoz      |
| Third Place | Behavioral and Social Sciences     | Victor Plancarte and Alexis De La Rosa | Are We Stuck in a Social Media Bubble?  | Central Union High               | L. Rueda      |
| Third Place | Biochemistry                       | Andrew Feng                            | A Customizable Single-Cell RNA-Seq Analysis Pipeline                                  | Canyon Crest Academy             | A. Haas       |
| Third Place | Biochemistry                       | Joseph Kalyuzhny                       | An HPLC Study of Vitamin C Concentration in Citrus Fruits                             | Mt. Everest Academy              | H. Tran       |
| Third Place | Biochemistry                       | Honoka Oba                             | Affinity of different plant catalase enzymes for its substrate hydrogen peroxide      | Bonita Vista High                | M. Mardahl    |
| Third Place | Computer Science                   | Edward Li                              | Predicting the Effectiveness of Herbal Supplements Through Customer Purchase Data     | Canyon Crest Academy             | A. Haas       |
| Third Place | Engineering - Electrical and       | Daniel Hernandez                       | Force with a Side of Potatoes   | Gompers Prep Academy High School | J. Ullyott    |
| Third Place | Engineering - Energy and Transport | Luis Prado and Alvin Vela              | Plant Microbial Fuel Cell   | Central Union High               | L. Rueda      |
| Third Place | Environmental Sciences and         | Hamza Dehaini                          | Clean Water from Solar Energy   | Islamic School of SD             | N. Nasereldin |
| Third Place | Medicine and Health Sciences       | William Frederick IV                   | How Tea Temperature Transforms Your Teeth   | Mt. Everest Academy              | R. Pachon     |
| Third Place | Medicine and Health Sciences       | Aylen Herrera and Natalia Sanchez      | Aerodynamic sports improve lung capacity (swimmers vs runners)                        | Bonita Vista High                | M. Mardahl    |
| Third Place | Medicine and Health Sciences       | Ainslie Mellinger                      | Exercising in a Pool and the Effects on the Heart Rate and Blood Pressure             | Mt. Everest Academy              | R. Pachon     |
| Third Place | Medicine and Health Sciences       | Melody Shyy                            | Micro-RNA-483 Targeting Connective Tissue Growth Factor: Implication in Wound Healing | Canyon Crest Academy             | A. Haas       |
| Third Place | Medicine and Health Sciences       | Kayla Stallworth                       | The Effect of Chamomile Tea on Daphnia's Heart Rate                                   | Central Union High               | L. Rueda      |
| Third Place | Medicine and Health Sciences       | Amber Torres                           | Neat Meat   | Eastlake High                    | C. Bayley     |
| Third Place | Medicine and Health Sciences       | Monica Villa and Dayan Pacheco         | Effect of Age on Peripheral Vision  | Central Union High               | L. Rueda      |
| Third Place | Microbiology                       | Diego Diaz                             | Music Grows Bacteria  | Gompers Prep Academy             | J. Ullyott    |
| Third Place | Microbiology                       | Daniel Leychkis                        | Effects of Caffeine on Growth Inhibition of Bacteria in Broad-Spectrum Antibiotics    | Canyon Crest Academy             | A. Haas       |

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|--------------|--------------------------------|---------------------------------------|--|--------------------------|------------|
| Third Place  | Physics and Astronomy          | Max Lake                              | The Physics of Figure Skating Jumps                                      | Mt. Everest Academy      | N. Negus   |
| Third Place  | Plant Sciences                 | Sebastian Oakes                       | How can Agrobacterium Tumefaciens can HElp the GRowth Rate of Mung Beans | Canyon Crest Academy     | A. Haas    |
|              |                                |                                       |  |                          |            |
| Fourth Place | Behavioral and Social Sciences | Mario Castillo                        | Is Multitasking with Different Subjects More Efficient?                  | King Chavez Community HS | D. Munoz   |
| Fourth Place | Computer Science               | Tristan Villanueva and Carlos Sanchez | Zeda Zoom  | Olympian High            | T. Claudio |
| Fourth Place | Computer Science               | Daniel Villicana                      | The Coding and Creation of a Video Game                                  | Central Union High       | L. Rueda   |

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