

| Place  | First name | Last name    | Co-authors   | School              | Category                    | Project Title                                                                                                                                                |
|--------|------------|--------------|--------------|---------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First  | Martina    | Banas        |              | Ardrey Kell HS      | Behavioral Science          | Athletes' Motivations During the COVID-19 Pandemic                                                                                                           |
| Second | Aryan      | Kodali       |              | Green Level HS      | Behavioral Science          | Teenagers Versus Quarantine                                                                                                                                  |
| Third  | Keisha     | Kalra        | Ishana Kalra | Providence HS       | Behavioral Science          | The Role of Furry Friends in facilitating Social Interaction during the COVID-19 pandemic                                                                    |
| First  | Emily      | Yang         |              | NCSSM HS            | Behavioral Science Advanced | The effects of social interaction on the distribution and acquisition of resources in terrestrial hermit crabs                                               |
| First  | Nnamdi     | Obi          |              | NCSSM HS            | Biological Science Advanced | Investigation of the Possible Synergistic Effects Between MSDC-0160 and Rapamycin in Treating Parkinson's Disease                                            |
| Second | Veda       | Dayananda    |              | East Mecklenburg HS | Biological Science Advanced | Identification of lncRNA Regulators of Tumor Suppressor Genes in Glioblastoma                                                                                |
| Third  | Hanna      | Gebremichael |              | NCSSM HS            | Biological Science Advanced | Potential Quorum Quenching Effects of Galactosamine on Enterobacter aerogenes                                                                                |
| First  | Chayse     | Chandler     |              | NCSSM HS            | Biological Science I        | Assessing the Effectiveness of the Hericium erinaceus Extract as an Acetylcholinesterase Inhibitor                                                           |
| Second | Esha       | Agarwal      |              | Enloe Magnet HS     | Biological Science I        | outSMARTPD: A Smartphone Monitoring App for Bradykinesia, Rigidity, and Tremor Designed to Remotely Assess Parkinson's Disease                               |
| Third  | Ananya     | Garg         |              | NCSSM HS            | Biological Science I        | The Use of Solid Lipid-Based Self-Emulsifying Drug Delivery Systems to Enhance the Bioavailability of Curcumin and Reduce the Effects of Alzheimer's Disease |

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| First  | Lixin    | Yang       |                 | NCSSM HS                 | Biological Science II  | The Effects of Small Molecules Jh-RE-06 and T2AA on Mutagenic Translesion Synthesis in <i>Arabidopsis thaliana</i>                                       |
| Second | Brianna  | Maga       |                 | Forestview HS            | Biological Science II  | The Rise of Skystarter                                                                                                                                   |
| Third  | Reva     | Kumar      |                 | HS                       | Biological Science II  | Assessing the Resistance of <i>Saccharomyces Cerevisiae</i> to UV Radiation                                                                              |
| Second | Kathryn  | Hart       |                 | Brevard HS               | Biotechnology          | The Effects of Zero-Valent Iron and Iron (III) on the Performance and Electricity Generation Potential of Microbial Fuel Cells                           |
| First  | Tianning | Chen       |                 | NCSSM HS                 | Biotechnology          | Computational Design of a Multi-Target NMDAR/AChE Ligand for the Symptomatic Treatment of Alzheimer's Disease                                            |
| First  | Aakriti  | Lakshmanan |                 | Levine Middle College HS | Biotechnology Advanced | Automatic Annotation of Social Behavior of Prairie Voles                                                                                                 |
| Second | Sadhana  | Ramesh     | Anjali Nelatoor | Ardrey Kell HS           | Biotechnology Advanced | A Novel Method for Non-Invasive Management of Bruxism and Prevention of Temporomandibular Joint Dysfunction                                              |
| Third  | Abhinav  | Gurram     |                 | Green Hope HS            | Biotechnology Advanced | Bioengineering Patient-specific Nephrons: Finding the Best Microenvironment to culture Human Induced Pluripotent Stem Cells into Kidney Epithelial Cells |
| First  | Nina     | Nair       |                 | NCSSM HS                 | Chemistry              | In Silico Rational Design of a Novel Anticancer Topo II $\alpha$ /Hsp90 Dual Inhibitor with Potential for Oral Administration                            |
| Second | Anika    | Bhadriraju |                 | NCSSM HS                 | Chemistry              | Computational Design of Pathogen-Specific Hsp90 Inhibitor to Target Malarial Parasites                                                                   |
| Third  | Nicholas | Boyer      |                 | NCSSM HS                 | Chemistry              | The Computational and Experimental Study of Cellulose in Ionic Liquids and Water for                                                                     |

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|        |                   |          |                         |                    |                            | Finding an Optimal Solvent for Biofuel Production                                                                                                                |
| HM     | Hannah            | Warlick  |                         | NCSSM HS           | Chemistry                  | A Specific, Reversible pH-Activated Delivery Polymer for the Identification of Malignant Brain Tumors                                                            |
| First  | Lisa              | Zhang    |                         | Providence HS      | Chemistry Advanced         | Rare-Earth-Free Silicon-Based Organic Molecules as Phosphors for Solid-State-Lighting Applications                                                               |
| First  | Isha              | Narang   |                         | Ardrey Kell HS     | Computer Science           | Using Automated Infant Posture Recognition to Reduce SIDS Risk                                                                                                   |
| Second | Reyansh           | Bahl     |                         | Green Level HS     | Computer Science           | An automated and accurate diagnosis of respiratory diseases and severity using computer vision and deep learning.                                                |
| Third  | Advaith           | Cheruvu  | Pratham Patel           | Green Level HS     | Computer Science           | The Future of Quantum Computation: Measuring Qubit Error Rate                                                                                                    |
| First  | Dheepthi          | Mohanraj |                         | NCSSM HS           | Computer Science Advanced  | BrCaVision: Predicting Breast Cancer Prognosis by Detecting Mitosis and Identifying Histological Tumor Subtypes in Whole Slide Tissue Images using Deep Learning |
| First  | Graham            | Green    | Isaiah Lefler           | Brevard HS         | Earth and Space            | An Evaluation of Hydroponic Cultures Growing Spinach Utilizing Nitrifying Bacteria in Conjunction with Martian Resources                                         |
| Second | Isabella          | Hardy    |                         | Griffin Academy HS | Earth and Space            | Weeds on Earth, Compost on Mars: Improving the Quality and Nutritional Value Provided by Martian Soil using Dandelion Crop Succession                            |
| First  | Evangelique-Faith | Barnes   | Fillip Cutiuba          | Raleigh Charter HS | Engineering and Technology | Subtitle Your Life: A Novel Way to Deal with Hearing Loss.                                                                                                       |
| Second | Pratham           | Madaram  | Siddharth Vijaymurugan, | Raleigh Charter HS | Engineering and Technology | Hydroelectricity Generators: How is it most efficient?                                                                                                           |

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|        |           |                | Jaichandra Nukala |                 |                                     |                                                                                                                                                          |
| Third  | Joshua    | Kupras         |                   | Brevard HS      | Engineering and Technology          | Computational Evaluation of a Vectored Channel Wing                                                                                                      |
| First  | Archita   | Khaire         |                   | Providence HS   | Engineering and Technology Advanced | A Twitter-Based Real-Time Alert System to Combat Large-Scale Vaccine Rollout Challenges                                                                  |
| Second | Prabuddha | Ghosh Dastidar | Connor Mitchell   | NCSSM HS        | Engineering and Technology Advanced | ARTHETA-0: An Innovative, Affordable Approach to the Onsite, Rapid 3D Printing of Artery Stents, Parameterized to Fit Individual Patients' Needs         |
| Third  | Jusung    | Park           |                   | Chapel Hill HS  | Engineering and Technology Advanced | Developing a Behavioral Platform for the Study of Whisker-Based Tactile Perception in Freely Moving Mice                                                 |
| First  | Karthik   | Nemani         |                   | Cox Mill HS     | Environmental Science Advanced      | A Novel Analysis of Economic Development versus CO2 Emissions for Empirical Proof of the Kuznets Curve and Insight into Future Trends                    |
| Second | Maria     | Mckibbon       | Lucy Murray       | HS              | Environmental Science Advanced      | An Analysis of Change in Bird Mist-Net Captures and Overall Bird Density Between 2008-2019 at Big Bald Banding Station and the Greer Doppler Radar Tower |
| First  | Felicia   | Yan            |                   | Enloe Magnet HS | Environmental Science I             | A GIS-based Flood Risk Assessment of Hog Farms in the Northeast Cape Fear River Basin of North Carolina                                                  |
| Second | Jamie     | Wenzel         |                   | NCSSM HS        | Environmental Science I             | The effects of soil-bound microplastic pollution on the growth and digestive behavior of the earthworm, Eisenia hortensis.                               |
| Third  | Ruhie     | Rapolu         |                   | NCSSM HS        | Environmental Science I             | Impact of Inorganic UV Filters on Aiptasia                                                                                                               |
| HM     | Mason     | Sufnarski      |                   | Marvin Ridge HS | Environmental Science I             | Rethinking Our Roads: The Ability of Porous Concrete to Reduce                                                                                           |

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|        |           |            |               |                                  |                          | Surface Runoff of Tire Wear Particles (TWP)                                                                                             |
| First  | Angela    | Chen       |               | HS                               | Environmental Science II | Assessing and Predicting Wildfire Severity in California based on Relationships between Wildfires and Drought by Using Machine Learning |
| Second | Sahil     | Azad       |               | NCSSM HS                         | Environmental Science II | Identifying Natural Flocculating Proteins for Affordable Anti-Microbial Sand Filters                                                    |
| Third  | Zorabella | Adrignola  | Sullivan Malo | Brevard HS                       | Environmental Science II | Analysis of Water Quality and the Presence of Microplastics and Macroinvertebrates in the Little River                                  |
| First  | Paarth    | Tara       |               | NCSSM HS                         | Mathematics              | A Dynamic Model of the Topological Evolution of Covert Networks                                                                         |
| First  | Aniketh   | Kolla      |               | Green Level HS                   | Physics                  | Particle Identification and Segmentation of LArTPC Data Using Deep Learning                                                             |
| Second | Kylie     | Burgess    |               | NCSSM HS                         | Physics                  | Examining X-Ray Emissions from Repeating FRB 180916.J0158+65                                                                            |
| Third  | Luigi     | Bortolussi |               | Highland School of Technology HS | Physics                  | Shedding Light on Contaminated Water                                                                                                    |