

March 10, 2021

Dear UAB Science and Engineering Fair Participants,

All of us at UAB are excited about the excellent presentations of the 278 middle and high school participants in the 21<sup>st</sup> annual UAB CORD Central Alabama Science and Engineering Fair. On the next pages you will see the list of awardees, but just as important is the effort of all the competitors, especially in this COVID-19 pandemic 12 months we are about to complete. The quality and creativity of the virtually presented posters were outstanding and as good or better than those in all other years. We thank Roger Gilchrist (lead judge) and the 40+ UAB and other professionals who judged the awards for us this year and special thanks to the leadership of Kevin Jarrett, Managing Director of the fair. He was able in 3 months to turn a very successful in-person fair into an excellent virtual fair. The UAB Fair was again the largest in Alabama and one of the largest in the nation.

For many of you, we look forward to seeing you at the IN-PERSON Fair in March of 2022. For the seniors who competed, we look forward to seeing many of you as students at UAB in the fall.

To all of you, thank you for participating and keep up the great work.

Best regards,



J. Michael Wyss, Ph.D.  
Director, Center for Community OutReach Development

Professor of Cell, Developmental and Integrative Biology, Medicine, Neurobiology, Biology and Psychology  
Director UAB STEM Center  
US Presidential Award for Excellence in Science, Math and Engineering Mentoring

**Go Blazers**

# UAB-CORD CARSEF Winners

March 5, 2021

## CARSEF TOP HONORS SENIOR DIVISION

The 6 projects on this page advance directly to the Regeneron International Science and Engineering Fair

### **Eli Muncher & Drew McDowell**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Tail Light Failure

### **Mayu Nakano**

10<sup>th</sup> Grade

Indian Springs School

Project Title: Intra-tumoral heterogeneity in Gene Expression within Single Glioblastoma Tumors

### **Eva Ledvina**

9<sup>th</sup> Grade

Jefferson County International Baccalaureate

Project Title: Factors that Affect Bird Activity in the Morning vs. the Afternoon

### **Emma Seidel**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: An Investigation in Precipitation Prediction with Machine Learning

### **Catherine Kung**

11<sup>th</sup> Grade

Indian Springs School

Project Title: Processing of Sensory Information from a Bio-Inspired Flexible Artificial Skin Using a Kohonen Artificial Neural Network

### **Amitis Moradkhani**

11<sup>th</sup> Grade

Indian Springs School

Project Title: Dye Removal with GO Reinforced Nanocomposite MOFs

# CARSEF CATEGORY WINNERS

## Senior Division

### BEHAVIORAL AND SOCIAL SCIENCE

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

#### *1<sup>st</sup> Place*

**Morgan Dotson & Kenny Nguyen**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: PATH ADHD Detection Game

#### *2<sup>nd</sup> Place*

**Maddison Canzano**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Music and Memory

#### *3<sup>rd</sup> Place*

**Marshelle Ike**

10<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Sleep Disturbance & Screen Time

#### *Honorable Mention*

**Chandler Caldwell**

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Likelihood of Video Game Addiction Between Gender

**Abijail Romero**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Time To Get Those Straight A's

**Jesalyn Dial**

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Cloudy With A Chance of Sadness

## **BIOLOGY – Senior Division**

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### *1<sup>st</sup> Place*

**Eva Ledvina**

9<sup>th</sup> Grade

Jefferson County International Baccalaureate

Project Title: Factors that Affect Bird Activity in the Morning Vs. the Afternoon

### *2<sup>nd</sup> Place*

**Lu'Keiyah Johnson**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: DNA: Among Us

### *3<sup>rd</sup> Place*

**Amith Varambally**

10<sup>th</sup> Grade

Vestavia Hills High School

Project Title: Adhesion Regulating Molecules (ADRM1) is Overexpressed in Breast Cancers and is a Marker for Prediction of Breast Cancer Patient Survival

### *Honorable Mention*

**Aubrey Eatmon**

10<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: What Happens When You Make Rock Candy

**Annesia Adkins**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Go Vegan!!

**Malek Adams**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: How Technology Can Affect Sleep for Teens

## CHEMISTRY – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Rishab Samat**

10<sup>th</sup> Grade

Vestavia Hills High School

Project Title: Through The Looking Glass: Uncovering the Molecular Mechanisms of Phytochemical Treatment for the Prevention of Age-Related Macular Degeneration

### 2<sup>nd</sup> Place

**Jonas Hernandez Alejo**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: The Mpemba Effect

### 3<sup>rd</sup> Place

**Christopher Edwards**

10<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Does Temperature Affect the Physical Reaction Between Mentos and 2-Liter Coke

### Honorable Mention

**Ja’Niyah Byner**

10<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Float or Sink Bath Bomb

**Melissa Hernandez Ojeda**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Baking The Perfect Cheesecake

**Miyoushi Hopkins**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Starches

## ENERGY AND TRANSPORTATION – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Eli Muncher & Drew McDowell**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Tail Light Failure

### 2<sup>nd</sup> Place

**Akshat Yaparla**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: Evolution of a Flow Field Over a Dynamically Pitching Wing

### 3<sup>rd</sup> Place

**Kellen Rutherford, Noah Renda & Jacob Jones**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Auto Ears

### Honorable Mention

**Le'andro Felips**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Energetic Persuasion

**Caleb Hickman & Dandrell Johnson**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: 3E-Wheel

**Grayson Davis & Zac Butterworth**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Bike Sensor Safety

## ENGINEERING – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Catherine Kung**

11<sup>th</sup> Grade

Indian Springs School

Project Title: Processing of Sensory Information from a Bio-Inspired Flexible Artificial Skin Using a Kohonen Artificial Neural Network

### 2<sup>nd</sup> Place

**Eliabeth Jason**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: The Measurement of Humidity to Compare the Reduction of the Spread of Airborne COVID-19 Particles Through Different Masks Worn by Airline Passengers

### 3<sup>rd</sup> Place

**Reagan Felts & Kaylee Rivas**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Hot Paws

### Honorable Mention

**Richard Hoyt Harris, Jr.**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: The Power of a Battery

**Sam Lovin, Daniel Cosby & Colton Hollingsworth**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Disc Golf Tracker

**David Davis & Luke Chamberlain**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Breathe Freely

## ENVIRONMENTAL AND EARTH SCIENCE – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Amitis Moradhani**

11<sup>th</sup> Grade

Indian Springs School

Project Title: Dye Removal with GO Reinforced Nanocomposite MOFs

### 2<sup>nd</sup> Place

**Malaika Dsa**

10<sup>th</sup> Grade

Jefferson County International Baccalaureate

Project Title: Off-Grid Homes: An Emerging Net-Positive Living Alternative to Traditionally Inefficient Homes

### 3<sup>rd</sup> Place

**Mary Clare Ingram & Maren Smith**

9<sup>th</sup> Grade

Homewood High School

Project Title: Eco-Friendly: Less Waste, Less Money?

### Honorable Mention

**Makayla Cunningham**

10<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Nasty Apple of Nah

**Amilyah Smith**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Endothermic vs. Exothermic Reactions in Liquid Solids

**Curtis Sims**

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Drinkable Saltwater



## MATHEMATICS AND COMPUTER SCIENCE – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Emma Seidel**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: An Investigation in Precipitation Prediction with Machine Learning

### 2<sup>nd</sup> Place

**Longji Jerry Chen**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: Computationally Light Tree Species Classification Using RGB Bark Images

### 3<sup>rd</sup> Place

**William Holland**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: Binary Words in Random Binary Sequences

### Honorable Mention

**Destinee Lee**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: The Unstoppable All-Stars

## MEDICINE AND HEALTH SCIENCE – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Mayu Nakano**

10<sup>th</sup> Grade

Indian Springs School

Project Title: Intra-tumoral heterogeneity in Gene Expression within Single Glioblastoma Tumors

### 2<sup>nd</sup> Place

**Hooper Markert**

12<sup>th</sup> Grade

Indian Springs School

Project Title: Resonant Frequencies as a Means of Detecting Metastases and Characterizing Pediatric Tumor Type

### 3<sup>rd</sup> Place

**Simon Ma**

11<sup>th</sup> Grade

Indian Springs School

Project Title: ADM-MCRP Net: An Auxiliary Diagnosis Method for Leukemia Based on Mult-CRP-Nets

### Honorable Mention

**Remy Cron**

12<sup>th</sup> Grade

Alabama School of Fine Arts

Project Title: The Effect of the Splice Mutation Intron 1, bp 54, G>T on DOCK8 Splicing

**Ariana Moody**

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: What Brand of Diapers is the Most Absorbent?

**Michelle Torres**

11<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Will Eating Breakfast Affect Student Performance

## PHYSICAL SCIENCE – Senior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Ryne McGuyer, Haley Page & Will Diggs**

12<sup>th</sup> Grade

Hewitt Trussville High School

Project Title: Firefighter Heat Alert System

### 2<sup>nd</sup> Place

**Alana Files**

10<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Hydraulic Press Smash 2!!

### 3<sup>rd</sup> Place

**Luis Salazar**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: To Catch a Bubble

### Honorable Mention

**Ambria Hawkins**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: "The Great Soaker"

**Tamara Caldwell**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Which Candle Burns the Fastest White or Colored?

**Brandon Davidson**

9<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Project Title: Smash Hit!

# CARSEF CATEGORY WINNERS

## Junior Division

### BEHAVIORAL AND SOCIAL SCIENCE

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

#### 1<sup>st</sup> Place

**Sophia Boxmeyer**

7<sup>th</sup> Grade

Tuscaloosa Magnet Middle School

Project Title: How Has the COVID Pandemic Affected Kids Emotionally?

#### 2<sup>nd</sup> Place

**Sydnee Allen**

8<sup>th</sup> Grade

W.J. Christian School

Project Title: Hawthorne Effect: I'm Watching You!

#### 3<sup>rd</sup> Place

**Nathan Lee**

7<sup>th</sup> Grade

Northridge Middle School

Project Title: Pets and Older Adult's Mental Health During Covid-19

### BIOLOGY – Junior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

#### 1<sup>st</sup> Place

**Grayson Whitman**

7<sup>th</sup> Grade

Hilltop Montessori School

Project Title: Which Masks Work Best?

#### 2<sup>nd</sup> Place

**Da'Nasia Middleton**

7<sup>th</sup> Grade

Huffman Middle School

Project Title: Does Your Amount of Screen Time Affect Your Sleep?

3<sup>rd</sup> Place

**Sophia Guo**

7<sup>th</sup> Grade

Northridge Middle School

Project Title: Photosensitivity of Cat Eye

Honorable Mention

**Martez Lutin**

8<sup>th</sup> Grade

W.J. Christian School

Project Title: Lung Capacity

**CHEMISTRY – Junior Division**

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

1<sup>st</sup> Place

**Syrai Pledger, Trinity Reynolds & India Gibson**

8<sup>th</sup> Grade

W.J. Christian School

Project Title: Watermelon Coffee High

2<sup>nd</sup> Place

**Marcus Montgomery**

8<sup>th</sup> Grade

W.J. Christian School

Project Title: Density vs. Oil

3<sup>rd</sup> Place

**Tyra Davis**

8<sup>th</sup> Grade

W.J. Christian School

Project Title: Toothpaste for the Elephants

Honorable Mention

**Shamira Jackson & Antwunyce Wilson**

8<sup>th</sup> Grade

Busch Hill STEAM Academy

Project Title: What Kind of Water Melts Ice Faster Salt Water, Tap Water or Baking Soda Water

## ENERGY AND TRANSPORTATION – Junior Division

1<sup>st</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Jacob Skankman & Josiah Whatley**  
6<sup>th</sup> Grade  
The Capitol School  
Project Title: Solar Car Design & Construction

## ENGINEERING – Junior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Austin Henderson**  
7<sup>th</sup> Grade  
Classical Conversations - Gardendale  
Project Title: Get to the Pointe!

### 2<sup>nd</sup> Place

**Madison Packer**  
6<sup>th</sup> Grade  
Huffman Middle School  
Project Title: Can the Pneumatic Lift Pick Up Items Up to 30 Pounds?

### 3<sup>rd</sup> Place

**Mariama Diallo & Kamorian Osborne**  
8<sup>th</sup> Grade  
Busch Hills STEAM Academy  
Project Title: Which Type of Cup Could Be Used to Make a Recyclable Step Stool: Plastic or Foam Cups?

### Honorable Mention

**John William Duffy & Michael Constantine**  
8<sup>th</sup> Grade  
Tuscaloosa Academy  
Project Title: Comfort Bot

## ENVIRONMENTAL AND EARTH SCIENCE – Junior Division

1<sup>st</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Sera Stone**

7<sup>th</sup> Grade

The Capitol School

Project Title: Using Mushrooms to Remove Oil in Salt Water

## MATHEMATICS AND COMPUTER SCIENCE – Junior Division

1<sup>st</sup> and 2<sup>nd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Lua Markert**

7<sup>th</sup> Grade

Advent Episcopal

Project Title: Pitch Perfect: Identifying Notes Based on Their Frequencies

### 2<sup>nd</sup> Place

**Maddie Tilford**

6<sup>th</sup> Grade

The Alberta School of Performing Arts

Project Title: Moderna Vaccine Temperatures and Security

## MEDICINE AND HEALTH SCIENCE – Junior Division

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place will advance to the Alabama Science and Engineering Fair

### 1<sup>st</sup> Place

**Kaylen Wilkerson**

8<sup>th</sup> Grade

W. J. Christian School

Project Title: Should Masks be Worn?

### 2<sup>nd</sup> Place

**William Crawford**

8<sup>th</sup> Grade

W. J. Christian School

Project Title: Electrolytes a Study of Sports Drinks

3<sup>rd</sup> Place

**Kolbe Kimbrough**

8<sup>th</sup> Grade

W. J. Christian School

Project Title: The Impact of Exercise on Your Blood Pressure

Honorable Mention

**Alashahmir Athar**

7<sup>th</sup> Grade

R. F. Bumpus Middle School

Project Title: Kids – Give Salt the Shake NOW!!

**Carter White & Lucas Storey**

8<sup>th</sup> Grade

O. D. Duran North Junior High

Project Title: Selective Super Shields

**Camari McCain**

6<sup>th</sup> Grade

Green Acres Middle School

Project Title: An Analysis of Medicinal Experiences Treating Toenail Fungus

**PHYSICAL SCIENCE – Junior Division**

1<sup>st</sup> place will advance to the Alabama Science and Engineering Fair

1<sup>st</sup> Place

**James Giles**

8<sup>th</sup> Grade

W. J. Christian School

Project Title: Does the Temperature Effect How High a Tennis Ball Will Bounce

**Special Awards**

**American Meteorological Society Award**

Emma Seidel

12<sup>th</sup> Grade

Alabama School of Fine Arts

An Investigation in Precipitation Prediction with Machine Learning



**American Psychological Association Award**

Sophia Boxmeyer

7<sup>th</sup> Grade

Tuscaloosa Magnet Middle School

How Has the COVID Pandemic Affected Kids Emotionally?

**Association for Women Geoscientists Award**

Sera Stone

7<sup>th</sup> Grade

The Capitol School

Using Mushrooms to Remove Oil in Saltwater

**NASA Earth System Science Award**

Arion McGowan

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Mapping Troposphere Ozone Levels Over Time

**NOAA's Taking the Pulse of the Planet Award**

Arion McGowan

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Mapping Troposphere Ozone Levels Over Time

**Regeneron Biomedical Science Award**

Mayu Nakano

10<sup>th</sup> Grade

Indian Springs School

Intra-tumoral Heterogeneity in Gene Expression within Single Glioblastoma Tumors

**Stockholm Junior Water Prize**

Curtis Sims

12<sup>th</sup> Grade

Holy Family Cristo Rey Catholic High School

Drinkable Saltwater

**Yale Science and Engineering Association Award**

Elizabeth Jason

12<sup>th</sup> Grade

Alabama School of Fine Arts

The Measurement of Humidity to Compare the Reduction of the Spread of Airborne COVID 19  
Particles Through Different Masks Worn by Airplane Passengers