

# 69th Annual Mid-Columbia



## REGIONAL SCIENCE & ENGINEERING FAIR

Held at Columbia Center Mall  
Tri-Cities, Washington

[www.midcolumbiasciencefair.org](http://www.midcolumbiasciencefair.org)

March 7, 8, 9, 2024

# Mid-Columbia Finalists Attend 2023 International Science & Engineering Fair

## Advaitha Motkuri

A sophomore at Richland High School, Richland, Washington entered her project in Computational Biology and Bioinformatics. Title of her project – AM Eye Drunk? The Future of Intoxication Detection.

## Ourania-Maria Glezakou-Elbert

A senior at Hanford High School, Richland, Washington entered her project in Physics and Astronomy. Title of her project – Controlled Edge Asymmetries as Means of Increasing Diode Efficiency in a Single Layer Superconductor.



Left to right: Matthew Yao, Ourania-Maria Glezakou-Elbert, Advaitha Motkuri, Aashrita Bhamidimarri

## Matthew Yao

A sophomore at Walla Walla High School, Walla Walla, Washington entered his project in Systems Software. Title of his project- Cam Visors: Cost-Effective Real-Time Object Detection using Contrastive Captioners for the Blind.

## Aashrita Bhamidimarri

A freshman at Hanford High School, Richland, Washington was the ninth grade observer and received an all expenses paid trip to ISEF.

## Sponsors Who Provided Funding and/or Special Awards for 2022–2023 ([www.midcolumbiasciencefair.org](http://www.midcolumbiasciencefair.org))

Agriculture Awards

Amentum

American Chemical Society, Richland Section

American Indian Science and Engineering Society, Columbia River Professional Chapter

American Nuclear Society, Eastern Washington Section

American Psychological Association (APA)

American Society of Civil Engineers, Columbia Section

American Society of Mechanical Engineers, Columbia Basin Section (ASME)

Association of Women Geoscientists

Atkins

Battelle

(which operates Pacific Northwest National Laboratory in Richland, WA)

Bechtel

Bob Rieck

Cadwell Laboratories, Inc.

Central Plateau Cleanup Co.

Columbia Center Mall

Columbia Center Rotary

Computer Science Award

Constance Wang

Creativity Award

D Hittle & Associates Inc.

Douglas Brown Memorial

Dr. Rama Devagupta

Rosalind Franklin Award

Dr. Richard Stark Memorial

Dr. & Mrs. Yao-Ying Yang

Eiholzer-Pangborn

Framatome

GENIUS Olympiad

Hanford Mission Integration Solutions

Health Physics Society, Columbia Chapter

IEEE, Richland Section

Inspiring Excellence, Inc.

Institute of Nuclear Material Management, Pacific Northwest Chapter

J-U-B. Engineers, Inc.

Lawrence Wang, M.D.

Lemelson Early Inventor Award

NASA Earth System Science Award

National Geographic

National Oceanic and Atmospheric Administration

Packaging Corporation of America

Pasco-Kennewick Rotary

Barbara Phillip, Ph.D., PE

Regeneron Biomedical Science Award

Richland Rotary

Ricoh Corporation

Sigma Xi, Tri-Cities Chapter

Sivaraman Award

Society of Women Engineers – Eastern Washington Section

Society for In Vitro Biology

STCU

STEM Enthusiast

Structural Engineers Association of Washington, South Central Chapter

The Links Incorporated

Thermo Fisher Scientific Junior Innovators Challenge

Tri-City Astronomy Club

U.S. Agency for International Development

U.S. Air Force

U.S. Metric Association

U.S. Navy / U.S. Marines, Office of Naval Research

WSSEF Award

Washington River Protection Solutions

Water Environment Federation

Wenas Mammoth Foundation Camp Scholarship

Women of Wisdom (WOW), Tri-Cities

Yale Science and Engineering Association, Inc.

## ANNOUNCEMENTS TO ENTRANTS

Any students enrolled in grades 6-12 in any public, private or home school in the Mid-Columbia region of Washington is eligible to enter his/her original exhibit that has not been displayed in previous Regional Fairs. Counseling and guidance will be provided upon request.

## EXHIBIT REQUIREMENTS

A tabletop space 122cm (48") wide by 76cm (30") deep is provided; 274cm (9') tall may be used.

The display must be safely constructed so spectators will not be exposed to faulty construction or electrical wiring. Dangerous chemicals, explosives, open flames, microbial cultures and fungi, poisonous animals or plants are not allowed and will be removed. We recommend the use of colored photographs of such items. Spectator-oriented controls may be part of the display if clearly labeled. All items should be firmly attached to prevent theft. The Fair Association cannot assume any liability for loss or damage to exhibits.

## IMPORTANT!!

### RULES FOR ALL PROJECTS IN GRADES 6-12:

1. **All projects in grades 6-12 must comply with the RULES of the 74th Regeneron International Science and Engineering Fair.** (<http://www.societyforscience.org/isef/>). **No Team Projects.**
2. Information involving state and federal regulations, controlled and hazardous substances, lasers, recombinant DNA, pathogens, animal and human research, gasohol, tissue samples is found in the Rules and Guidelines on the ISEF website: <http://www.societyforscience.org/isef/>
3. STEM WIZARD will be used as the interface for uploading and updating projects forms, research plans, abstract and registration. Access STEM WIZARD via Mid-Columbia website: [www.midcolumbiasciencefair.org](http://www.midcolumbiasciencefair.org)
4. Upload a copy of the abstract on STEM WIZARD of the research- including objective (purpose), hypothesis, procedure, results( data), conclusions, reflections or applications- using not more than 250 words by March 4.
5. Research plan and all forms must be uploaded to STEM WIZARD by Feb. 13, 2024. February 27 is the deadline to complete research plan and forms revisions. Experimentation may continue until the abstract deadline of March 4.
6. A written REPORT and DISPLAY BOARD, based on the scientific method and JOURNAL are required.
7. Adult Sponsor Checklist, Research Plan, Approval Form and Students Checklist 1B must be signed BEFORE experimentation begins and submitted on STEM WIZARD.
8. **BEFORE RESEARCH BEGINS** - ALL research involving live vertebrate animals, human subjects (including yourself), recombinant DNA, human or animal tissue, pathogenic agents, and controlled substances must be reviewed and approved by the regional Scientific Review Committee. February 13, 2024 will be the last day for submitting these forms to SRC or IRB. Submission will be through STEM WIZARD. Check with your adult sponsor for the proper forms.

### GETTING STARTED

Before you begin, please note that research refers to library research and information gathering.

Experimentation refers to work done in the field or laboratory after forming hypotheses.

- A) **Pick Your Topic.** Get an idea of what you want to study. Ideas might come from hobbies or problems you see that need solutions. Limit your topic, as you have little time and resources. You may want to study only one or two specific events.
- B) **Research Your Topic.** Go to the library and read everything you can on your topic. Observe related events. Gather existing information on your topic. Look for unexplained and unexpected results. At the same time, talk to professionals in the field, write to companies for information, and obtain or construct needed equipment.
- C) **Organize And Theorize.** Organize everything you have learned about your topic. At this point you should narrow down your hypothesis by focusing on a particular idea. Your library research should help.
- D) **Make A Timetable.** As you narrow down your ideas, remember to choose a topic that not only interests you, but can be done in the amount of time you have. Get out a calendar to mark important dates. Make sure to leave a week to fill out the necessary forms and to review your Research Plan with your Sponsor. Some projects need approval from a Scientific Review Committee (SRC) before they are started, so be sure to allow time for that process. Give yourself plenty of time to experiment and collect data - even simple experiments do not always go as you might expect the first time, or even the second time. After you have finished your experiments, you will probably need a few weeks to write a paper and put together an exhibit.

- E) **Plan Out Your Research.** Once you have a feasible project idea, you should write out a research plan. This plan should explain how you will do your experiment and exactly what it will involve.

*Any student participating in the Science Fair is required to complete the Research Plan, Approval Form and Checklist.*

- F) **Consult Your Adult Sponsor.** You are required to discuss your Research Plan with your Adult Sponsor and get his/her signature of approval. Your sponsor should review your Research Plan and use the Checklist under Forms Section to determine if you need any additional forms and/or SRC approval.
- G) **Conduct Your Experiments.** Give careful thought to designing your experiments. As you conduct your research and experiment, keep detailed notes of each and every experiment, measurement, and observation. Do not rely on memory. Remember to change only one variable at a time when experimenting, and make sure to include control experiments in which none of the variables are changed. Make sure you include sufficient numbers of test subjects in both control and experimental groups.
- H) **Examine Your Results.** When you complete your experiments, examine and organize your findings. Did your experiments give you expected results? Why or why not? Was your experiment performed with the exact same steps each time? Are there other causes that you had not considered or observed? Were there errors in your observations? Remember that understanding errors and reporting that a suspected variable did not change the results can be valuable information.
- I) **Draw Conclusions.** Which variables are important? Did you collect enough data? Do you need to do more experimenting? Keep an open mind - never alter results to fit a theory. Remember, if your results do not support your original hypothesis, you still have accomplished successful scientific research. An experiment is done to prove or disprove a hypothesis.

**EXHIBITORS WHO DO NOT MEET THESE REGULATIONS WILL BE DISQUALIFIED. THERE WILL BE A \$5.00 ENTRY FEE PER STUDENT. VISIT THE WEBSITE (WWW.MIDCOLUMBIASCIENCEFAIR.ORG) FOR THE COMPLETE PROGRAM AND FAIR DATES.**

# Fair Awards

Judging criteria will include creative ability, scientific thought, thoroughness, skills, clarity, visual display.

All entrants will receive a Certificate of Participation and will be invited to attend the Awards Ceremony, Saturday, March 9. All entrants will have an opportunity to discuss their projects with scientists and engineers.

MIDDLE SCHOOL			
AWARD*	6TH GRADE	7TH GRADE	8TH GRADE
<i>*possible awards</i>			
First	\$75	\$100	\$150
Second	\$50	\$70	\$100
Third	\$35	\$50	\$70
Up to 25 percent of the remaining entrants in each division may receive an Honorable Mention 1 <sup>st</sup> place winners in grades 6, 7, 8 are awarded a Science Camp Opportunity (\$600.00 value)			

**SCIENCE AND ENGINEERING FAIRS** offer an exceptional opportunity to enrich school programs at both the elementary and secondary levels through encouraging independent project work, developing displays, having work judged by professional scientists and engineers, sharing similar interests with other students, competing for awards and receiving local, national and even international recognition. For the future scientist and non-scientist alike, Science and Engineering Fair work provides experience and motivation that are reflected in both personal and classroom development.

**THE TEACHER** is the most important factor in starting and maintaining a Science and Engineering Fair - by encouraging students to do investigations on their own, either in or out of school; by helping to organize and run the Fair; and by gaining support from other faculty, parents, and the community for the program.

SENIOR HIGH SCHOOL DIVISION	
9th, 10th, 11th & 12th	
<b>GRAND PRIZE</b> Up to 3 students will receive an expenses paid trip the Regeneron International Science and Engineering Fair, May 11-17, 2024 in Los Angeles, CA.	
<b>OBSERVER</b> A ninth grade student may be selected this year as an observer and also receive an expenses paid trip.	
First	\$200
Second	\$125
Third	\$75
Up to 25 percent of the remaining entrants in each division may receive an Honorable Mention 1 <sup>st</sup> place winners in grades 6, 7, 8 are awarded a Science Camp Opportunity (\$600.00 value)	

**LOCAL SCIENCE AND ENGINEERING FAIRS** are the simplest, yet perhaps the most important, because every student who wishes to do so may display his or her work. The projects are then seen and appreciated by the people who know the students best: parents, neighbors, teachers and fellow students.

**REGIONAL SCIENCE AND ENGINEERING FAIR** brings together the most outstanding projects which have been selected from school fairs within a city, county, group of counties, state or foreign nations. Sponsors of such fairs include newspapers, colleges, and universities, industries and scientific and engineering societies.

**THE INTERNATIONAL SCIENCE AND ENGINEERING FAIR** is the culminating event each year for over 1700 finalists selected from affiliated regional fairs.

THURSDAY, MARCH 7	FRIDAY, MARCH 8	SATURDAY, MARCH 9
8:00 a.m. - 9:00 a.m. All projects (6-12th) must be set up	Mall Hours Open to Public	10:00 a.m. - 6:00 p.m. Open to Public
6 - 12th GRADE Judging discussions with scientists begin at 9:00 a.m. Schedule will be available at registration 2:30 p.m. - Mall Closing Time Open to Public Viewing		1:00 p.m. Awards Ceremony
		6:00 p.m. Remove Exhibits