

# WSSF Quarter Note

## From the Director's Desk

Happy Holidays 2019!

Perhaps this detailed preview of some special awards presented at the Wyoming State Science Fair (March 1-3, 2020) will be a motivation as you prepare your projects for local and regional fair competitions. The awards highlighted in this newsletter are provided because the Wyoming State Science Fair is affiliated with the International Science and Engineering Fair. These awards are sponsored by national organizations and often have very specific qualifications. Other awards (from the University of Wyoming and local organizations) will be announced on Facebook (Wyoming Science-Fair) in the coming weeks. Please read the award descriptions carefully, and learn more about the sponsoring organizations who support your research. They could be your potential future employers.

Our office is in the process of moving to another building this holiday season. As a result, our University of Wyoming Department number is changing to Dept. 4320, and our phone number will be changing as well (number is TBD). The only reliable way to reach us from now through the Wyoming State Science Fair event (March 1-3, 2020) will be [wyostatefair@gmail.com](mailto:wystatefair@gmail.com).

Our snail mail address will be:

Wyoming State Science Fair  
University of Wyoming Dept. 4320  
1000 E. University Ave.  
Laramie, WY 82071

~ Erin Stoesz, Wyoming State Science Fair Director

## 2019-2020 Project Categories

- 1) Animal Sciences
- 2) Plant Sciences
- 3) Behavioral & Social Sciences
- 4) Biomedical & Health Sciences/Biomedical Engineering/Translational Medical Sciences
- 5) Chemistry/Energy: Chemical
- 6) Biochemistry/Cellular & Molecular Biology/Computational Biology & Bioinformatics
- 7) Earth & Environmental Sciences/Environmental Engineering
- 8) Engineering Mechanics/Materials Science/Energy: Physical
- 9) Mathematics
- 10) Microbiology
- 11) Physics & Astronomy
- 12) Robotics & Intelligent Machines/Embedded Systems/Systems Software

Most people say that it is the intellect which makes a great scientist. They are wrong: it is character.

~ Albert Einstein

## ISEF Affiliated Fair Special Awards

### Society for In Vitro Biology Award



The Society for In Vitro Biology provides a certificate award to the most outstanding 11th grade student whose research project is in the areas of plant or animal in vitro biology or tissue culture. In addition, the award recipient will receive publicity in the society's newsletter and might be invited to submit an abstract of their work at the society's annual meeting.

Learn more about the Society at <http://www.sivb.org>

### U.S. Metric Association Award



The U.S. Metric Association recognizes a student in any division or category whose project involves quantitative measures and correctly uses units of the SI metric system for those measures. Winning projects should use a variety of metric units for different kinds of measures, and use of those measures should be integrally important in the student research. The subject of the winning project should not be the SI system itself.

Learn more about the U.S. Metric Association at <https://usma.org>

### Yale Science & Engineering Association Award



The Yale Science & Engineering Association, Inc. provides one certificate and pewter medallion to the most outstanding 11th grade project (10th or 12 grade projects may be eligible in extraordinary cases) in Computer Science, Engineering, Physics or Chemistry.



Learn more about the Yale Science & Engineering Association at: <http://groupspaces.com/ysea>

Image from: The Yale Science & Engineering Association, Inc.

### Mu Alpha Theta Certificate



Mu Alpha Theta, the National High School and Two-Year College Mathematics Honor Society, provides a certificate of recognition to a senior division (9th-12th grade) project (individual or team) that demonstrates the most challenging, original, thorough and creative investigation of a problem involving mathematics accessible to a high school student(s). Projects in any category are eligible. Judging will be based on creative ability, use of mathematics (more than arithmetic and basic statistics), scientific thought, thoroughness, skill, clarity, and teamwork (if applicable).

Learn more about Mu Alpha Theta at: [www.mualphatheta.org](http://www.mualphatheta.org)

# American Meteorological Society Certificate



The American Meteorological Society recognizes 9th, 10th, 11th or 12th grade students (unless those are less meritorious than junior division exhibits) who have done creative research in the areas of atmospheric and related oceanic and hydrologic sciences. Award recipients receive a certificate of achievement and recognition in the December issue of the *Bulletin of the American Meteorological Society (BAMS)*.

Learn more about the American Meteorological Society at: [www.ametsoc.org](http://www.ametsoc.org)

# NASA Earth System Science Certificate Award



NASA offers the Earth System Science Award in an effort to increase awareness regarding the importance of scientific research in the area of Earth system science, the study of the complex system and the interconnections that occur on Earth.

This award is to recognize a project that best demonstrates insight into Earth's interconnected spheres (atmosphere, lithosphere, hydrosphere, cryosphere, and biosphere). The winning project should incorporate studies including different spheres of the Earth system, their interactions and change over time. It should include cause-effect relationships based on evidence and demonstrate a clear understanding of how those relationships affect Earth as a system.

The winning project might be selected from any of the following sub-disciplines:

**Atmospheric Science**— Studies of the Earth's atmosphere, including air quality and pollution and the processes and effects of the atmosphere on other Earth systems as well as meteorological investigations.

**Climate Science**— Studies of Earth's climate, particularly evidential study of climate change as it relates to Earth's systems.

**Environmental Effects on Ecosystems** — Studies of the impact of environmental changes on ecosystems, including empirical pollution studies.

**Geosciences** — Studies of Earth's land processes, including mineralogy, plate tectonics, volcanism, and sedimentology.

**Water Science**— Studies of Earth's water systems, including water resources, movement, distribution, and water quality.

**NASA uses the vantage point of space to understand and explore our home planet, improve lives and safeguard our future.** Earth's spheres interact in complex ways. Changes in one sphere affect other spheres because they are all interconnected. NASA is involved in numerous research and educational efforts to find answers to questions about these complex interactions. In addition, NASA is developing a scientific understanding of how Earth's system responds to changes that are occurring as a result of natural and human-made causes. Through a variety of Earth system satellite missions, NASA is striving to provide researchers and scientists with the data they need to find these answers. **Students are encouraged to use NASA data in their Earth system science projects.**

Learn about NASA and available NASA data at: <https://www.nasa.gov/>

"To achieve great things, two things are needed: a plan and not quite enough time."

~conductor/composer Leonard Bernstein

## ISEF Affiliated Fair Special Awards Cont.

### Ricoh Sustainable Development Certificate Award



Ricoh Americas Corporation is offering a certificate award to an outstanding project that addresses issues of environmental responsibility and sustainable development.

The winning project must demonstrate principles and technical innovations that offer the greatest potential for increasing our ability to grow environmentally friendly and socially responsible businesses. The winning project must also reflect energy conservation, resource conservation/recycling, pollution prevention, or biodiversity conservation.

Ricoh Americas is a major award donor at the International Science & Engineering Fair, having awarded more than \$430,000 total to 33 student award recipients in the last 16 years.

The winning project from ISEF 2019 worked to address a potable water crisis in Uganda. Read the project abstract at: <https://abstracts.societyforscience.org/Home/FullAbstract?ISEFYears=2019%2C&Category=Any%20Category&Finalist=Chen&AllAbstracts=False&FairCountry=Any%20Country&FairState=FL&ProjectId=17092>

Learn more about Ricoh at: <https://www.ricoh-usa.com/rsda>

### NOAA's "Taking the Pulse of the Planet" Award



The National Oceanic and Atmospheric Administration recognizes student research that emphasizes NOAA-related science by presenting a certificate to a project by either middle or high school student(s). The winning research project will emphasize NOAA's mission of **Science, Service and Stewardship**: **"To understand and predict changes in climate, weather, oceans and coasts, To share that knowledge and information with others, and To conserve and manage coastal and marine ecosystems and resources."**

NOAA is a trusted source of accurate information in four areas of global importance and will select a winning project that focuses on any of these four areas:

**Ecosystems**— Ensure the sustainable use of resources and balance competing uses of coastal and marine ecosystems, recognizing both their human and natural components.

**Climate**— Understand changes in climate, including the El Nino phenomenon, to ensure that we can plan and respond properly.

**Weather & Water**— Provide data and forecasts for weather and water cycle events, including storms, droughts, and floods.

**Commerce & Transportation**— Provide weather, climate, and ecosystem information to make sure individual and commercial transportation is safe, efficient, and environmentally sound.

Projects will be judged on creative ability (30%), scientific approach (~30%), thoroughness (~15%), skill (~15%), and clarity (~10%).

Learn more about NOAA education resources and student opportunities at: <https://www.noaa.gov/education>

# NEW!!! U.S. Agency for International Development (USAID) Certificate



The U.S. Agency for International Development (USAID) awards a certificate to a project that has the potential to make an impact on addressing international development challenges.

Winning projects will be relevant to any of the following:

**Agriculture and Food Security**— USAID is advancing global food security by helping families and individuals meet their need for a reliable source of quality food and sufficient resources to produce or purchase it.

**Democracy, Human Rights, and Governance**— By helping societies protect the basic rights of citizens, USAID helps prevent conflict, spur economic growth and advance human dignity. We are supporting free and fair elections, up-to-date technology for new and traditional media, as well as the rule of law.

**Economic Growth and Trade**— Broad-based economic growth is essential to sustainable, long-term development. USAID is focused on activities such as giving people access to markets where they can sell their goods play a productive role in their economies; and improving infrastructure like roads, bridges, water supply, and electrical grids.

**Education**— USAID works to ensure that children and youth, particularly the most marginalized and vulnerable, have increased access to quality education that is safe, relevant, and promotes social well-being. Additionally we help children and youth gain literacy, numeracy, and social-emotional skills that are foundational to future learning and success.

**Environment and Global Climate Change**— USAID is helping communities better manage and benefit from their natural resources, fighting deforestation and planting trees, protecting biodiversity, and mitigating and adapting to the effects of climate change, so countries can grow without harming the environment while strengthening their resilience to weather shocks.

**Gender Equality and Women's Empowerment**—At USAID, we believe that gender equality and women's empowerment is the core of development. For societies to thrive, women and girls must have access to education, healthcare, and technology. They must have control of resources, lands and markets, and they must have equal rights and equal opportunities as breadwinners, peace-builders and leaders.

**Global Health**—USAID's global health efforts are focused around three strategic priorities: 1) preventing child and maternal deaths; 2) controlling the HIV/AIDS epidemic; 3) and combating infectious diseases like malaria and tuberculosis.

**Science, Technology & Innovation**— We channel the technical expertise of scientists and researchers to build local scientific capacity, empowering people with tools for change, and use the evidence from scientific research to drive new policies and programs.

**Water and Sanitation**— USAID works with partner countries and key stakeholders to achieve four interrelated objectives including: 1) increasing access to sustainable safe drinking water and sanitation services and promoting hygiene; 2) protecting freshwater resources; 3) promoting cooperation on shared waters; 4) strengthening water governance and financing.

**Working in Crises and Conflict**— With a focus on disaster prevention, response, recovery and transition, USAID provides assistance to save lives and alleviate suffering; provides emergency food assistance while sowing the seeds for recovery and resilience; and to promote peaceful political transitions.

Since 2014, USAID has been major award sponsor at the International Science and Engineering Fair, giving over \$200,000 total to ISEF winners. Read about previous winning projects at: <https://student.societyforscience.org/us-agency-international-development>

USAID's work advances U.S. national security and economic prosperity, demonstrates American generosity, and promotes a path to recipient self-reliance and resilience. Learn more about USAID at <https://www.usaid.gov>

The scientist is not a person who gives the right answers, he's one who asks the right questions.

~Claude Lévi-Strauss, *Le Cru et le cuit*, 1964

## ISEF Affiliated Fair Special Awards Cont.

### American Psychological Association Education Directorate Certificate



The American Psychological Association Education Directorate recognizes a student or team of students for outstanding research in psychological science under the category of behavioral and social sciences or any category relating to psychology (e.g., animal sciences, biochemistry, computer science, environmental science, mathematical science, medicine and health).

Projects are judged based on creative ability (~30%), scientific thought (~30%), thoroughness (~15%), skill (~15%), and clarity (~10%).

Learn more about the American Psychological Association at: <https://www.apa.org/index>

### Association for Women Geoscientists Certificate



The Association for Women Geoscientists recognizes female students whose projects exemplifies high standards of innovativeness and scientific excellence in the geosciences. The project that receives recognition should increase public awareness of the geosciences, illustrate the interdisciplinary nature of the geosciences, or promote the sensitivity to the earth as a global system.

Learn more about the Association for Women Geoscientists at: <https://www.awg.org/index.php>

### ASM Materials Education Foundation Award



The ASM Materials Education Foundation recognizes the best materials engineering project at the fair with a ribbon and certificate.

Projects will be judged on the following criteria:

- 1) Use of materials-related concepts
- 2) Demonstration of some aspect of the materials paradigm, i.e. structure-processing-properties-performance relationships
- 3) Clarity in presentation
- 4) Clear understanding of the scientific method
- 5) Aesthetics—layout of the project, neatness, etc.

Learn more about ASM Materials Education Foundation at: <https://www.asmfoundation.org/>

See who won some of these awards at the 2019 Wyoming State Science Fair!

<http://www.uwyo.edu/sciencefair/2017wssfawardwinners.html>

# Wyoming State Science Fair Category Awards

1st, 2nd and 3rd place awards will be given in every category and division. 1st place winners will be considered for eligibility to enter the Broadcom MASTERS or International Science & Engineering Fair.

Category awards are judged on the following criteria (science criteria in black; engineering criteria in blue):

## I. Research Question (~10%) / Research Problem (~10%)

- \_\_\_ clear and focused purpose/ description of practical need or problem to be solved
- \_\_\_ identifies contribution to field of study/ definition of criteria for proposed solution
- \_\_\_ testable using scientific methods/ explanation of constraints

## II. Design and Methodology (~15%)

- \_\_\_ well designed plan and data collection methods/ exploration of alternatives to answer need or problem
- \_\_\_ variables and controls defined, appropriate and complete/ identification of a solution
- \_\_\_ development of a prototype or model

## III. Execution: Data Collection, Analysis and Interpretation (~20%) / Construction and Testing (~20%)

- \_\_\_ systematic data collection and analysis/ prototype demonstrates intended design
- \_\_\_ reproducibility of results/ prototype has been tested in multiple conditions and trials
- \_\_\_ appropriate application of mathematical and statistical methods
- \_\_\_ sufficient data collected to support interpretation and conclusions
- \_\_\_ prototype demonstrates engineering skill and completeness

## IV. Creativity (~20%) (criteria applies to both science & engineering projects)

- \_\_\_ project demonstrates significant creativity in one or more of the above criteria (applies to science & engineering)

## V. Presentation (~35%) (all criteria apply to both science & engineering projects)

### a. Poster

- \_\_\_ logical organization of material
- \_\_\_ clarity of graphics and legends

### b. Interview

- \_\_\_ supporting documentation displayed
- \_\_\_ clear, concise, thoughtful responses to questions
- \_\_\_ understanding of basic science relevant to project
- \_\_\_ understanding interpretation and limitations of results and conclusions
- \_\_\_ degree of independence in conducting project
- \_\_\_ recognition of potential impact in science, society and/or economics
- \_\_\_ quality of ideas for further research
- \_\_\_ for team projects, contributions to and understanding of project by all members