

Montana Tech Regional Science and Engineering Fair

High School Division

2009 Award Winners

On Thursday, March 12, 2009, Montana Tech hosted 71 students from 7 high schools across Western Montana in the Montana Tech Regional Science and Engineering Fair. Every student was judged by a team of experts and the top third of the projects earned the right to compete at the state science fair which will be held in Missoula, MT March 23 & 24, 2009.

The highlight of the fair, was the awarding of the Montana Tech Silver Access Fee Waiver, a scholarship valued at nearly \$4,000, to Butte High School student Danielle Bay. Danielle plans to major in Nursing. The project, Augmentation of the Highlands Bighorn Sheep Herd in Southwest Montana earned Miss Bay and her teammate, Christopher Doyle many awards.

Making history, Butte High School earned the top performing school for the first time at this fair in nearly a decade. This accomplishment was achieved with a sweeping of all four Butte High competitors earning Grand Prize Overall Awards. Those students are; Danielle Bay, Christopher Doyle, Daoning Zhou, and Andrew MacGregor. Earning the Grand Prize Overall Award, entitles these four students to all-expense paid trips to compete at the International Science and Engineering Fair in Reno, NV this May. The trip is sponsored by Montana Tech and the Dennis & Phyllis Washington Foundation.

Second Place School was earned by Missoula Sentinel High School with 78% of their students earning medals.

Rudolfo Villarreal-Calderon from Big Sky High School earned 3rd Place Individual Grand Award. Luke VonLanKen and Bryce Caye from Missoula Sentinel earned 3rd Place Team Grand Award. These students will serve as alternates to the ISEF fair in case one of the Butte students cannot attend.

A detailed listing of which students earned medals and the thirty-nine special awardees are below. More information about the fair can be found at www.mtech.edu.

Montana Tech Regional Science and Engineering Fair

Bronze Medal Winners

Grade: 9

Team Project

9406 **The Use of Chemical Oxygen Demand to Determine the Methane Output of Spent Brewer's Grains**
McKinney, Nicholas
Big Sky High School

Grade: 10

Engineering

7804 **Piezoelectricity Used to Harness the Energy of the Ocean**
Koester, Timothy
Hellgate High School

Team Project

9402 **Do Mining Operations Affect the Aquatic Insect Population In Montana Rivers**
Harris, Chris
Hunton, Kolin
Missoula Sentinel High School
Missoula Sentinel High School

Grade: 12

Computer Science

7601 **Using ImageJ In the Numerical Study of Neurons in Fluoroscopy**
James, Desiree
Hellgate High School

Engineering

7803 **A Magnetic Levitation Runway for Commercial Aircraft**
Hicks, Luke
Missoula Sentinel High School
7807 **Building an Autonomous Aquatic Robot**
Haith, Sarah
Hellgate High School
7806 **Metallurgy CSI**
Howard, Elliot
Hellgate High School

Team Project

9406 **The Use of Chemical Oxygen Demand to Determine the Methane Output of Spent Brewer's Grains**
Brault, Christopher
Big Sky High School

Montana Tech Regional Science and Engineering Fair

Silver Medal Winners

Grade: 10

Animal Science/Zoology

7101 **The Probability of Wolverine Using the Levy Walk**
Stevenson, Jessy Hellgate High School

Mathematical Sciences

8300 **The Relationship between the Knowledge of Basic Arithmetic Facts and Success in Higher Lever Math**
Shannon, Brandon Missoula Sentinal High School

Grade: 11

Animal Science/Zoology

7102 **An Evaluation of Pattee Creek Missoula, MT, and the Effectiveness of the Restoration Efforts on**
Dickson, Rose Big Sky High School

Physics and Astronomy

8604 **The Streaming Velocities of Pulsating Aurora**
Parrott, Derek Missoula Sentinal High School

Team Project

9404 **The Effects of Milltown Dam Removal on Macro-Invertebrate Populations in the Clark Fork River**
Caye, Bryce Missoula Sentinal High School

9404 **The Effects of Milltown Dam Removal on Macro Invertebrate Populations in the Clark Fork River**
VonLanken, Luke Missoula Sentinal High School

Grade: 12

Earth and Planetary Science

7701 **Correlating Class A Pan Evaporation to Cloud Cover**
Viktora, Aleeshia Hellgate High School

Engineering

7808 **An Exploration of Wind Belt Technology Applied to the Energy Needs of Rural, Agricultural Montana**
Elrod, Thomas Hellgate High School

Environmental

8100 **Effect of Constructed Wetlands on Water Temperature: Implications for Native Trout Populations**
Stringer, Allison Missoula Sentinal High School

Medicine and Health Sciences

8405 **Emissions of Road Dust & its Relation to Pulmonary Disease**
Brendal, Caitlyn Big Sky High School

Montana Tech Regional Science and Engineering Fair

Gold Medal Winners

Grade: 10

Behavioral and Social Sciences

7200 **A Cross Country Look at the Multifactor Productivity of Research and Development Spending**
Gagliardi, Richard Hellgate High School

Medicine and Health Sciences

8401 **Isolating a Novel Antibiotic from Bacillus flexus, a Bacterium Found in the Human Microbiome**
Macgregor, Andrew Butte High School

Grade: 11

Environmental

8101 **Air Pollution and Myocardial Inflammation**
Villarreal-Calderon, Rodolfo Big Sky High School

Microbiology

8501 **A counter selectale marker for Borrelia burgdorferi**
Douglass, Miles Hellgate High School
8500 **Isolating an Anti-cancer Compound from the Acid Mine Fungus Trichoderma virens**
Zhou, Daoning Butte High School

Grade: 12

Plant Sciences

8701 **Effects of Extracts of Leaves from Centaurea maculosa (Spotted Knapweed) on Germination of Grass**
DeNitto, Sarah Big Sky High School

Team Project

9405 **Augmentation of the Highlands Bighorn Sheep Herd in Southwest Montana**
Bay, Danielle Butte High School
Doyle, Christopher Butte High School

- 8 **Award:** Montana Tech Geological Engineering Department Award
Hannah Leonard Comparative Study of Mt. St. Helens Ash Hellgate High School
- 9 **Award:** Mu Alpha Theta Award
Brandon Shannon The Relationship between the Knowledge of Basic Arithmetic Facts and Success in Higher Level Math Courses Missoula Sentinel High School
- 10 **Award:** The National Oceanic and Atmospheric Administration (NOAA) Award
Timothy Koester Piezoelectricity Used to Harness the Energy of the Ocean Hellgate High School
- 11 **Award:** The Montana Tech Library Award
Elliot Howard Metallurgy CSI Hellgate High School
- 12 **Award:** National Society of Professional Engineers Award
Luke Hicks A Magnetic Levitation Runway for Commercial Aircraft Missoula Sentinel High School
- 13 **Award:** The 2009 Regional Ricoh Sustainable Development Award
Timothy Koester Piezoelectricity Used to Harness the Energy of the Ocean Hellgate High School
- 14 **Award:** The Society for In Vitro Biology
Daoning Zhou Isolating an Anti-cancer Compound from the Acid Mine Fungus *Trichoderma virens* Butte High School

15 **Award:** The United States Army Award

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| Caitlyn Brendal | Emissions of Road Dust & its Relation to Pulmonary Disease | Big Sky High School |
| Chris Harris | Do Mining Operations Affect the Aquatic Insect Population In Montana Rivers | Missoula Sentinel High School |
| Hannah Leonard | Comparative Study of Mt. St. Helens Ash | Hellgate High School |
| Kaitlyn Horner | Global Warming Versus the Geographical Distribution of Malaria | Hellgate High School |
| Kolin Hunton | Do Mining Operations Affect the Aquatic Insect Population In Montana Rivers | Missoula Sentinel High School |

16 **Award:** Montana Tech Metallurgy Department Award

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| Elliot Howard | Metallurgy CSI | Hellgate High School |
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17 **Award:** Yale Science & Engineering Award

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| Derek Parrott | The Streaming Velocities of Pulsating Aurora | Missoula Sentinel High School |
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18 **Award:** Montana Tech Mining Engineering Award

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| Chris Harris | Do Mining Operations Affect the Aquatic Insect Population In Montana Rivers | Missoula Sentinel High School |
| Kolin Hunton | Do Mining Operations Affect the Aquatic Insect Population In Montana Rivers | Missoula Sentinel High School |

19 **Award:** The Montana Fish, Wildlife & Parks Award

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| Rose Dickson | An Evaluation of Pattee Creek Missoula, MT, and the Effectiveness of the Restoration Efforts on Westslope Cutthroat Trout, <i>Onchorhynchus clarkii</i> | Big Sky High School |
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20 **Award:** Madison Valley Ranchlands Award

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| Sarah DeNitto | Effects of Extracts of Leaves from <i>Centaurea maculosa</i> (Spotted Knapweed) on Germination of Grass Seeds Native to Montana and Eurasia | Big Sky High School |
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21 **Award:** Montana Tech Petroleum Engineering Department Award

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| Will Wright | Biodiesel on the Farm IV: Cost Analysis | Belgrade High School |
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22 **Award:** International Sustainable World (Energy, Engineering & Environment) Project

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| Kelseigh Beatty | Passive Solar Energy in Residential Housing Design | Big Sky High School |
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| Thomas Elrod | An Exploration of Wind Belt Technology Applied to the Energy Needs of Rural, Agricultural Montana | Hellgate High School |
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| Timothy Koester | Piezoelectricity Used to Harness the Energy of the Ocean | Hellgate High School |
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23 **Award:** US Metric Association

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| Luke Hicks | A Magnetic Levitation Runway for Commercial Aircraft | Missoula Sentinel High School |
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24 **Award:** Professional & Technical Communications Award

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| Richard Gagliardi | A Cross Country Look at the Multifactor Productivity of Research and Development Spending | Hellgate High School |
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25 **Award:** United States Navy

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| Christopher Brault | The Use of Chemical Oxygen Demand to Determine the Methane Output of Spent Brewer's Grains | Big Sky High School |
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| Kimberly Ledger | Comparison of Oxidative Thermal Stability of Cooking Oils in Standard Frying Applications | Big Sky High School |
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| Nicholas McKinney | The Use of Chemical Oxygen Demand to Determine the Methane Output of Spent Brewer's Grains | Big Sky High School |
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26 **Award:** United States Air Force

Brittany Deshner The Predictability of Bloodspatter Missoula Sentinel High School

Jordan Costello Total Acid Titrations Using an Acid-Base Indicator for Determination of Titrant Addition Missoula Sentinel High School

Karley Whisman Physical Activity of High School Students with Chronic Disease, Permanent Mobility Impairment & Intellectual Disability Big Sky High School

Richard Farrar Design, Construct & Test of a Foot Pedal Grain Mill Big Sky High School

27 **Award:** CFWEP Award

Rose Dickson An Evaluation of Pattee Creek Missoula, MT, and the Effectiveness of the Restoration Efforts on Westslope Cutthroat Trout, *Onchorhynchus clarkii* Big Sky High School

28 **Award:** Student Assistance Foundation Award

Shelby Gensch Accuracy of FACES based on Recall and Time Hellgate High School

29 **Award:** Junior Stockholm Water Award

Allison Stringer Effect of Constructed Wetlands on Water Temp. Missoula Sentinel High School

30 **Award:** Highest Scoring 09th Grade Project Award

Nicholas McKinney The Use of Chemical Oxygen Demand to Determine the Methane Output of Spent Brewer's Grains Big Sky High School

31 **Award:** Highest Scoring 10th Grade Project Award

Richard Gagliardi A Cross Country Look at the Multifactor Productivity of Research and Development Spending Hellgate High School

32 **Award:** Highest Scoring 11th Grade Project

Rodolfo Villarreal-Calderon Air Pollution and Myocardial Inflammation Big Sky High School

33 **Award:** Highest Scoring 12th Grade Project

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|---------------|---|---------------------|
| Sarah DeNitto | Effects of Extracts of Leaves from <i>Centaurea maculosa</i> (Spotted Knapweed) on Germination of Grass Seeds Native to Montana and Eurasia | Big Sky High School |
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34 **Award:** Montana Tech Silver Access Award

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|-------------------|---|-------------------|
| Christopher Doyle | Augmentation of the Highlands Bighorn Sheep Herd in Southwest Montana | Butte High School |
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| Danielle Bay | Augmentation of the Highlands Bighorn Sheep Herd in Southwest Montana | Butte High School |
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35 **Award:** Second Place Team Grand Award

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| Luke VonLanken | The Effects of Milltown Dam Removal on Macro Invertebrate Populations in the Clark Fork River | Missoula Sentinal High School |
| Bryce Caye | | |

36 **Award:** First Place Team Grand Award

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|-------------------|---|-------------------|
| Christopher Doyle | Augmentation of the Highlands Bighorn Sheep Herd in Southwest Montana | Butte High School |
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| Danielle Bay | Augmentation of the Highlands Bighorn Sheep Herd in Southwest Montana | Butte High School |
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37 **Award:** Third Place Individual Grand Award

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| Rodolfo Calderon | Air Pollution and Myocardial Inflammation | Big Sky High School |
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38 **Award:** Second Place Individual Grand Award

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| Daoning Zhou | Isolating an Anti-cancer Compound from the Acid Mine Fungus <i>Trichoderma virens</i> | Butte High School |
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39 **Award:** First Place Individual Grand Award

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|------------------|--|-------------------|
| Andrew Macgregor | Isolating a Novel Antibiotic from <i>Bacillus flexus</i> , a Bacterium Found in the Human Microbiome | Butte High School |
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