On March 6-8, 2016, hundreds of students from throughout Wyoming came to Laramie to be judged for a chance to compete at the Broadcom MASTERS, a national competition for 6th-8th graders, and Intel International Science and Engineering Fair (ISEF), a competition for 9th-12th graders. The personal and financial awards in these competitions are substantial and several Wyoming students qualified to enter. "I am excited to take 4 excellent students, 1 volunteer, and 1 teacher to the Intel ISEF in Phoenix on May 8-13, 2016," says Wyoming State Science Fair Coordinator Erin Stoesz.

Original research displayed at the 2016 Wyoming State Science Fair (WSSF) addressed such diverse topics as bull riding, satellites, supercomputer cooling systems, and cellular biology. When not competing, students enjoyed science enrichment activities, planetarium shows, and a banquet emceed by Inside Energy Data Journalist and Intel ISEF Alumna Jordan Wrifs-Brock. Each student received a T-shirt to commemorate the event, and teachers took home Erlymeyer flasks and a special discount offer from Fischer Science Education for their classrooms.

A big ‘thank you’ goes to all of the volunteers and supporters who made it possible especially graduate students Jonathan Hoffman and Dauda Orunsolo; a super team of volunteers; WY STEM; and special presenters Dr. Peter Parolin (UW Department Head of English & Awards Program MC); Dr. Jacqueline Leonard (UW Science & Mathematics Teaching Center Director); and Dr. Bill Gern (UW Vice-President for Research & Welcome Ceremony Presenter).

“When youth engage in real scientific research on a topic that interests them and enter into science fair competitions, it can be a life-changing experience, especially for high school students who stand the chance to discover their scientific passions, earn money for college, and meet potential mentors. Summer is a great time for students to begin research, and we are happy to support interested students by connecting them to mentors and resources,” says Erin Stoesz. Please contact the WSSF at wyostatefair@gmail.com to learn more about the science fair program.
From the Desk of Dr. Leonard, SMTC Director

The Science and Mathematics Teaching Center is pleased to report new admissions for our Middle-Level Mathematics and Science endorsement and master’s degree programs. We welcome the following students: Theresa Graves, Willow Curtis, Alicia Noble, Winsor Demore, Val Williamson, Brandee Maurer, Julie Slagle, Melissa Coffin, Jean Uselman, Daniel Johnson, Tyler Loyd and Ronald Ruckman. Zoe Nelson was also admitted into the MST program. Seven graduate students from the Teton Science Schools have been admitted into the Natural Science Education program for this fall. Moreover, we are happy to report that six students earned master’s degrees during the summer and fall of 2015. Twelve students are on target to graduate in spring and summer of this year.

The SMTC hired Erin Stoesz as the new Wyoming State Science Fair Coordinator. She has been very busy working with regional fair directors and coordinating the 2016 Wyoming State Science Fair that was held at UW in Laramie on March 6-8, 2016. Kudos to Erin for all of her efforts and a very successful fair. A new doctoral student assisted her with the science fair: Dauda Adegbuyega Orunsolu, who is also the newest EMAT doctoral student, and hails from Lagos, Nigeria.

Our recruitment for the Noyce internship and scholarship programs is also complete. We currently have a full complement of eight scholars in our first cohort, six new scholars have been admitted into the second cohort, and ten Noyce interns will work in various camps/programs in Wyoming and Pennsylvania this summer. Three cohorts will participate in the program which will run until 2019. These students are majoring in civil engineering, geology, mathematics, psychology, biology, and zoology. All of these scholars are also going to obtain certification to teach at the elementary level. The SW ARMS program focuses on secondary certification and runs through 2018. Two graduate assistants have worked with the Principal Investigators, Jacqueline Leonard and Andrea Burrows, with recruitment, support, mentoring activities, including basketball games and other social events. Thank you, Ashley Andersen and Katie Guffey, for outstanding leadership.

The e-Learning Communities for Academic Language Learning in Mathematics and Science (ECALLMS) will end in August 2016. Recently six Wyoming teachers and one UW faculty member participated in reviewing online modules on computational thinking and mathematics discourse. Joy B. Johnson (Princeton High School, Princeton, New Jersey), Adrienne Unertl (Clark Elementary School, Evanston, Wyoming) and Jacqueline Leonard developed these modules, which will be offered to teachers nationally through the University of Colorado Denver.

Finally, I recognize our staff and faculty in the SMTC. Sylvia Parker continues to serve the SMTC well as Coordinator. She is engaged in a number of initiatives that include recruitment of new students for all of our programs, program review and assessment, and collaborations with affiliate faculty across campus. Ana Houseal received support from the Wyoming Department of Education for garnering another Math and Science Partnership grant that focuses on professional development with teachers in Campbell County. Joslyn White joined the SMTC as our accounting associate in July 2015. Welcome from Botany, Joslyn! Finally, Lindsay Galey completed her second year as office associate. As Director of the SMTC, I am fortunate to have colleagues and staff who possess a wealth of talent and expertise.
Wyoming Interns to Teacher Scholars (WITS) Update:

Our 8 scholarship recipients in cohort, Tonya Busse (Klawock, AK), Vicki Bonds (Cheyenne, WY), Clinton Ghee (Miami, FL), Heather Madsen (Laramie, WY), Mendi Maes (Sheridan, WY), Trey Michael (Leavenworth, WA), Brock Nuckles (Groveport, OH), and Garret Westlake (Gainesville, FL) are all making progress towards achieving a greater goal of incorporating diverse students with STEM degrees into elementary classrooms across the country. The WITS summer internship program is an additional opportunity for students to get hands-on experience teaching in Wyoming. Scholars Tonya & Mendi participated in the Sinks Canyon State Park internship where they helped develop interpretive programs for visitors and led cave tours with their spelunking summer camp, too!

Tonya then had the opportunity to travel with several other advisory board members and students in the WITS and SW ARMS scholarship programs from UW to the Western Regional NOYCE Conference in San Diego, where she shared her story with a large audience of conference-goers from many western colleges and universities. According to Tonya: “My internship at Sinks Canyon challenged me to go beyond the classroom to experience teaching in a way that was engaging and action-packed. The opportunity to gain valuable hands-on experience in my field is one of the many benefits there are to being a WITS scholar.” If you or someone you know is a rising Sophomore or Junior STEM major, and might be interested in either becoming a WITS scholar or participating in our summer internship program, visit our website at www.witsnoyce.com for more information.

Congratulations!

Jennifer O’Connor, a teacher at Wyoming Indian Middle School in Ethete, WY, received a Science Advocate Grant from the Society for Science and the Public! Jennifer had students compete at the Wyoming State Science Fair for the first time in 2015. She is looking forward to using this grant money ($3,000) to start a summer/after school program to help Native American students conduct original science research and enter the Wyoming State Science Fair and the American Indian Science and Engineering Fair. Visit https://www.societyforscience.org/society-advocate-grant to learn more about the Science Advocate Grant.

By the Numbers
2016 Wyoming State Science Fair:

- 68 projects in the senior division (9th-12th grade)
- 231 projects in the junior division (6th-8th grade)
- 330 students participated
- 180+ awards were presented
- 40 schools from 14 counties were represented
- 100+ professional scientists volunteered as judges
- 40+ UW students, staff and Laramie, WY community members helped with logistics
Developing New Science Curriculum in Coal Country

For the past three years Campbell County School District #1 and Ana Hou-seal of the SMTC have been joint recipients of Wyoming Department of Education’s Math Science Partnership Grants. Participating teachers have been taking part in several professional development workshops throughout the school year and summer and have been working in grade level cohorts to develop new science curriculum based upon the Framework for K-12 Science Education and the Next Generation Science Standards (NGSS). This partnership has been a collaborative effort among UW faculty from various departments, numerous graduate students, and CCSD administrators and K-12 teachers.

Each year graduate students in the SMTC have had the opportunity to conduct their Plan B project research on related topics, including the development of curriculum evaluation rubrics, the compatibility of place-based education with the NGSS, and the efficacy of professional development in integrating NGSS. The first two projects - Supplemental Curricula and Science and Engineering Practices in the Next Generation Science Standards: Developing a Tool for Identification and Alignment by Tayla Fulcher (MS 2014) and Next Generation Science Standards and Place-Based Education: An Intrinsic Case Study of Teacher Experience by Sarah Hackworth (MS 2015) are available for use through the Wyoming Scholars Repository at http://repository.uwyo.edu/plan_b/.

Although developing and revitalizing science curriculum for an entire district has been an ambitious goal, this partnership has proven to be an empowering and informative learning experience for all individuals involved.
Where are they now?

From time to time, we like to update you on the whereabouts and activities of graduates from SMTC programs. If you’d like to be included in future updates, please contact us at smtc@uwyo.edu.

Joel Pontius

University of Wyoming Degrees: M.S. Natural Science, Ph.D. in Education (with a focus in Science Education)

Current Position: Assistant Professor of Sustainability and Environmental Education and Director of Goshen College’s Sustainability Leadership Semester (https://www.goshen.edu/)

I work at a 1200-acre nature preserve that is owned by Goshen College, a liberal arts college in the Lake Michigan watershed that focuses on environmental sustainability and social justice. I direct Goshen College’s Sustainability Leadership Semester which is an immersion style program for undergraduate students from backgrounds including environmental science, peace justice and conflict studies, the arts and humanities, business, and interdisciplinary studies. It is designed to be a catalyst for emerging leaders in sustainability. During the program, students live in a LEED platinum-certified community, contribute to an on-site organic farm that provides much of their food, and study sustainability experientially. An example of the experiential nature of the program is the 10-day canoe trip from the headwaters of our watershed all the way to Lake Michigan. Along the way we talk to farmers, natural resource managers, private residents, and others who live or use land along the banks of the river, engaging in conversations about ecological communities and sustainability. I also teach two courses in Goshen College's Master of Arts in Environmental Education program and mentor graduate students in their research.

Throughout my studies at UW, the SMTC faculty strongly supported my interdisciplinary interests around environmental education and sustainability. I was encouraged to develop unique scholarly passions and to take risks to dig deeper and to learn more which has dramatically changed the trajectory and authenticity of my career path. Through the SMTC, I interacted with leaders in the field of environmental education including David Greenwood, Canada Chair of Environmental Education Research. I am now co-editing a book with David and Michael Mueller, Professor of Education at University of Alaska, Anchorage, entitled Place-Based Studies on Hunting, Gathering, and Fishing for Food, which will be published in the Springer Environmental Discourses in Science Education book series in Winter 2017. This would not have been possible without the connections and thoughtful dedication of SMTC faculty to their students.

My time at the SMTC was filled with exploration, growth, and learning far beyond the walls of the classroom. When I think of my time at the SMTC, the dedicated people and vibrant personalities come to mind more than anything. I am deeply grateful to the SMTC for all of the support professionally, academically, and personally.

Leah Ritz

University of Wyoming Degree: M.S. Natural Science Education


I oversee all the educational programs at The Science Zone including field trips, afterschool programs, pre-K programming, homeschool science programming, Lego Robotics, outreach events, summer camps, and exhibit acquisition and development.

Thanks to my graduate assistantship in which I developed place-based energy curriculum for the School of Energy Resources, I was able to make great connections with folks from around the state that eventually led me to my dream job working at a science museum.

Gina Graziano

University of Wyoming Degree: M.S. Natural Science Education


Based out of Point Blue headquarters in Petaluma, CA, I plan and implement STRAW’s (Students and Teachers Restoring a Watershed) educational goals and programs with a strong team of educators. I work closely with our STRAW teachers and students, faculty, and partners to connect students to place, empower students through hands-on restoration and environmental education, and equip the next generation with tools to face complex environmental challenges. I find service learning to be an engaging and effective way of putting students in touch with solutions, forming connections with communities, and making learning relevant and long-lasting.

I designed my thesis around the discovery of common themes and practices of water and watershed education programs in the western United States. I had the opportunity to learn about STRAW and Point Blue through this work, and ended up getting a job there. I could not be happier to now be a member of the team.
Science & Mathematics Teaching Center

Congratulations to 2016 Storer Scholars!

Seven University of Wyoming students will gain experience teaching science to elementary school students in the outdoors in Saratoga or Lander this summer through the Storer Scholars Award. Chosen from a large pool of applicants, the awardees show promise for leadership and excellence in teaching. The undergraduate Storer Scholars, Abigail Palmquist, Lauren Huntington and Bailey Crompton will co-teach in Lander in June; and Kaycee Cordingly, Anne Salisbury and Brooke Amen will co-teach in Saratoga in July. Julie Thomsen, the graduate Storer Scholar, will teach both summer programs. The summer science enrichment programs are offered in conjunction with Fremont CSD #1 in Lander and Carbon CSD #2 in Saratoga. Both groups of UW students are recipients of Storer Scholars Awards from the George B. Storer Foundation. This is the 5th year of the Storer Scholars Award program and is designed to provide the award winners with training and teaching experience in place-based science education and a financial award. Undergraduates receive $2000 each and the graduate student receives $3000 plus travel expenses.

Coordinator's Update

The SMTC continues to support and participate in a wide-range of collaborations at UW and beyond. In addition to offering master's degree programs in Middle Level Science (MSC), Middle Level Mathematics (MMA) and Natural Science Education (NED), we provide professional development to teachers throughout Wyoming and the region; we collaborate with scientists on broader impacts; and we assist in the planning and carrying out of major events. We also sit on advisory boards, do research, write papers, make presentations, and support the work of others. We work closely with EPSCoR, the School of Energy Resources (SER), the Haub School of Environment and Natural Resources (ENR), the Biodiversity Institute and WYSTEM primarily through our graduate students who have assistantships with them. A few examples: we're working with the College of Engineering to offer an Engineering Summer Program for Teachers (ESP4T) this summer with follow up support during the school year to implement the use of Arduinos in their classrooms. Ana Houseal has been actively involved in the development of new science standards for Wyoming and has brought national attention to her work on 3-dimensional learning in Campbell County. Jackie Leonard and others founded the Council on Women and People of Color (CoWPoC) and have been successful in pushing for greater coherence in the approach to diversity here at UW. I'm on the planning team for a Sci-Art Symposium on Re-envisioning the Laboratory that seeks to catalyze interdisciplinary collaborations (Save the Date: Sept 9-10, 2016, and watch for more information). The attention on STEM continues to grow and the SMTC is well-positioned with our 46-year history of promoting excellence in P-20 science and mathematics teaching and learning to continue playing a major role.

Every year the UW Art Museum sponsors a student art show and the SMTC promotes our commitment to the concept of STEAM (as well as STEM) by purchasing a piece of art or awarding a cash prize. This year Hannah Sease received a $200 cash award for her watercolor entitled "Flight to the Moon" which illustrates a traditional Inuit folktale.

Ashley Allen, the first graduate student to receive a Storer Scholars Award in 2012 offered the current recipients the following: "As a 4th grade teacher at the Vail Mountain School in Colorado, I look back on my time as a Storer Scholar with great fondness. I enjoyed experiencing new landscapes, interacting with and inspiring young Wyomingsites, and honing new teaching strategies and lessons. I send my congrats to the new group of Storer Scholars. My insight for those who are planning on being classroom teachers is to embrace PBE. I've found that integrating place-based (science) education into my classroom a) is completely feasible, and b) always brings learning to life - sparks excitement, increases relevance, and has a lasting impact on students."

Sylvia D. Parker