

SDSTA

South Dakota Science Teaching Association

Winter Issue | Date: December 23, 2021

Dear Members,

Happy Holidays and Happy Christmas Break!! The year 2021 is quickly coming to an end so it is time to reflect on the good. I am so grateful for all of you and how much time you spend making sure your students get everything they need.

This year it has been decided that we will be "Together Again" for our annual joint conference! The 30th Annual SD STEM Ed Conference will be held in Huron, February 3rd, 4th, and 5th. As we all know, things can change in an instant, but I truly need, and am excited to be "Together Again" with all of you! I have missed seeing everyone in person. Two years is too long to be apart! Can you tell what our theme is for this 30th Annual STEM Ed Conference? The theme is "Together Again!"

The Schedule-at-a-Glance (SAAG) is on our [website](#) ready for your viewing. The program will be there soon so be sure to check often. I will hopefully send an email to let you all know when the program is ready. Looking through the program the first time is like looking through the Sears Catalog before Christmas. (Yikes! I'm really showing my age with that remark.)

There are a couple of incentives for signing up for the conference soon. One, it is a little bit cheaper to sign-up by January 24th. Two, you can no longer register online after January 24th. You need to register onsite and could miss out on getting a banquet ticket when waiting until the day of the conference. Three, the first 150 registrants receive a complimentary copy of "Engagement by Design" by Douglas Fisher! Read the details about the free book on page 6.

On pages 4 and 5, there are details about our SD

STEM Ed Conference speakers, the Sanford Underground Research Facility Education and Outreach Team and Travis Lape. They are some of the best speakers in the nation and they live right here in South Dakota. The other sessions will be presented by some of the best educators in the nation. Yes, I am referring to all of you who are so generous to share your knowledge with us.

This year is a Science election year. The nominations and election will be held during our annual meeting that will be held on February 4th in Dakota E, at 4:30 pm at the Crossroads Event Center in Huron, South Dakota. Yep, we have our annual meeting during the annual STEM Ed Conference. Have you ever considered volunteering your time to be a part of the SDSTA executive team? If you are interested, there is more information on page 7. If you have questions, email me and I will do my best to answer them.

I cannot wait to see all of you in February! Go to our [website](#) and get registered! :)

If you would like to submit something to be included in the March newsletter, please email the information to Julie Olson, kernelmom@gmail.com, and/or me by March 12th.

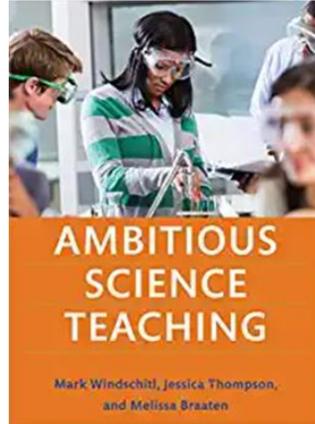
Continue being resilient in our fight to educate by making our students feel safe, making learning fun, and keeping our relationships with our students strong.

Thank you for all you do in providing a quality education for each of your students!

Michelle Bartels
SDSTA President

Two opportunities to have fun "Applying" with Jen!

Applying Ambitious Science Teaching and Applying Sense Making in Science



What:

- Two different semester-long courses geared to increase your students' engagement in class while you implement your learned information in class. Sign up for one or both, understanding the amount of learning is notable.
- The courses use Schoology as a platform with four 3-week modules inspiring you to communicate with other participants who are planning, implementing, and then reflecting on successes and areas for revision.
- **Taken one of these courses already for credit? You may join us again** to adapt more lessons and units around aspects you have already begun to apply in your classroom, or for new ideas as well. The course titles are different than before, so you would be eligible for two more graduate credits, if desired.
- Jen Fowler will be facilitating these courses, once again. Since Spring 2020, Ambitious Science Teaching was offered three times and Student Sense Making was offered two times. It is exciting to surface them again.
- Books will be provided courtesy of SD DOE following registration. (Info coming soon.)

When: Feb 7 – May 8, 2022

Note that there are weekly assignments due on Sunday evenings in Schoology. Rubrics will be available for your thorough planning, implementation, and reflection.

"Taken one of these courses already for credit? You may join us again."



Join DOE Science Listserv

To join the DOE Science listserv use this link:
<https://www.k12.sd.us/MailingList/DOEScience>

Who:

Any South Dakota K-12 Science educators may participate. Teachers at various grade bands, instructional coaches, and informal educators have all appreciated the time using the information from these two books. **You may participate again if you have already. Share this information with interested colleagues you collaborate with.**

Credits:

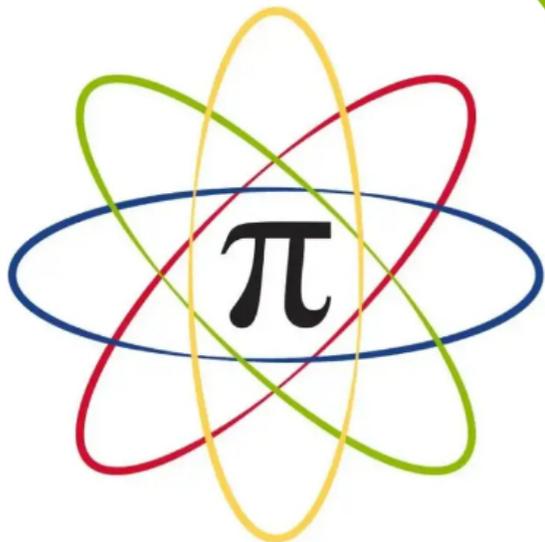
Certificates for up to 30 contact hours or 2 graduate credits (pending BHSU syllabus approval) \$80 for graduate credit (\$40/credit = reduced tuition, non-refundable if course is dropped)

Stay tuned to the DOE Science listserv for registration information coming soon!

Science Teacher Google Doc

[This Science Teacher Conversations Google Doc](#) is an awesome place to pose a question and maintain documentation of the responses. Please consider following the directions on it when you have a question for the listserv. There are several conversations started and it is nice to see all the responses and the ability to revisit them as needed.

30th Annual SD STEM Ed Conference



February 3, 4, & 5, 2022

TOGETHER AGAIN!

A conference dedicated to professional learning and collaboration.

- ✓ Thursday Night Sharing Sessions
- ✓ Science Sessions
- ✓ Math Sessions
- ✓ Technology Sessions
- ✓ FREE LUNCH both days!

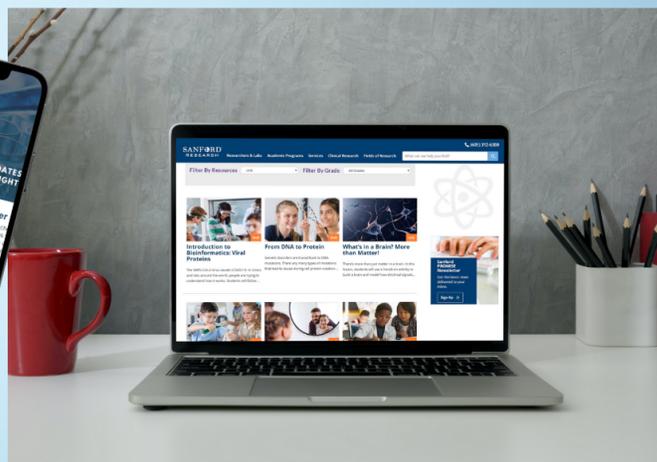
For more information and to register go to:
<http://bit.ly/SDSTEMEd>

Location: Crossroads Event Center, Huron, SD

Sanford PROMISE Resources



Sanford PROMISE provides STEM education and outreach for Sanford Research. We're working to inspire the next generation of scientists, problem solvers, and thinkers. Visit the website to find **lesson plans, videos, printables, request a visit from us, or borrow equipment!**



Stay up to date by subscribing
to our newsletter.

promise.sanfordhealth.org | @SanfordPROMISE

Sanford Underground Research Facility Education & Outreach Team



SURF supports K-12 STEM education through school presentations, curriculum modules, and field trips for students as well as professional development for teachers. Our work is based on South Dakota's science standards where we work to create and advance innovative educational programming at the local, state, and national levels. We believe that every student deserves high-quality, engaging, relevant, equitable, and rigorous science learning experiences. Join one of our many presentations at the SD STEM Ed Conference 2022 or stop by our booth in the exhibit hall to learn how we can support you and your students.

Sessions from the SURF Team

- **Ashley Armstrong** – Dive into Summer Professional Development
 - Interactive Classroom Presentations
- **Peggy Norris** – Research Experiences for Teachers: A Poster Session
 - Sound and Light, Part 1 & Part 2
- **Nicol Reiner** – Creating Opportunities to Use the Science Standards for Mathematical Practice
- **Chad Ronish** – By Land or by Sea, Powered by the Wind
 - Creating Engagement Using Phenomena
 - It's Electric, But It's So Much More Than That
 - Putting Real World TE in STEM!
 - STEM Education and Afterschool Partnerships

Travis Lape - Innovative Programs Director

Travis has been teaching in South Dakota his entire career. He has been both a classroom teacher and technology integrationist. For the past 6 years he has now served as the districts Innovative Programs Director. A position where he helps continue to lead the district in innovative practices. Travis's goal is to create learning experiences that empower and equip learners with necessary skills to effectively produce and consume content across multiple media platforms. He also works hard to help educators feel confident when using technology. His goal is that all teachers would take risks and try new ways of engaging students.



Travis played a prominent role in helping one of the middle schools in Harrisburg transform their media center to be more learner center. This was done through creating a space that learners could call their own. The maker space at South Middle School was designed using Laura Fleming's framework.



(Click on picture for Youtube video.) In 2016, Travis was the recipient of the TIE Technology Leader Award for the State of South Dakota.

Travis is an educational consultant, thought leader and speaker on education, technology and designing schools differently.

Sessions from Travis (offered both Friday and Saturday)

- Build A Bot and Watch It Go
- INVENT. CREATE. EXPLORE.
- STEM, Meet Design Thinking

The Balance with Catlin Tucker: Featuring **Travis**

Catlin talked with Travis about school design and the ways in which Harrisburg School District is re-imagining school for its students.



Travis also co-hosted the Movers & Makers Podcast.

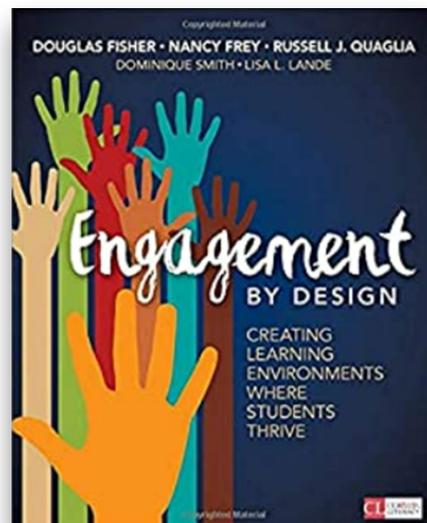
Extra Incentive for Early SD STEM Ed Conference Registration !

The first 150 people who register will receive a complimentary copy of “Engagement by Design” by Douglas Fisher!

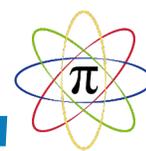
Registration is now open for the 2022 SD STEM Ed Conference. This year’s theme is “Together Again.” Don’t forget that registration costs increase as the conference date approaches.

Fisher provides a framework for making daily improvements in engaging your students and highlights how to reap the greatest benefits in the least amount of time. Focusing on relationships, clarity, and challenge can make all the difference.

This book is provided through a generous grant awarded by the SD Department of Education. Special thanks to Kelly Royer and Jennifer Fowler at DOE.



What are you waiting for? Sign-up for the SD STEM Ed conference!



Call for Nominations - SD OBTA 2022

To nominate a teacher for the 2022 award, email the nominees contact information to the OBTA Director jeff.peterson@k12.sd.us. Please write 2022 OBTA Nomination in the subject line and include your email signature.

Criteria for Selection

1. Candidates must be presently teaching biology/life science (includes middle school) and must have devoted a significant portion of his/her career to the teaching of biology/life science.
2. Candidates from public, private, and parochial schools are eligible.
3. A minimum of three years of teaching experience is mandatory before applying for the OBTA award.
4. Candidates need not be members of NABT.
5. Unsuccessful candidates may be re-nominated from year to year.
6. Candidates may receive the award more than once, after 10 years.



Application Process and Award

The nominee will receive an email notification with application details including a deadline of March 31. In April, all completed applications are reviewed by a selection committee. Upon notification the awardee will receive an invite to the 2022 NABT national conference, a 1,200 dollar stipend sponsored by Sanford Health, and recognition at the local, state, and national levels!

Daniel Swets Robotics Materials Award

The NASA South Dakota Space Grant Consortium offers the **Daniel Swets Robotics Materials Award(s)** for a total of up to \$13,000 in memory of the unprecedented enthusiasm and vision that Dr. Dan Swets of Augustana College brought to the state of South Dakota in the field of robotics. The grant is awarded annually to South Dakota teachers/educators who either have: A) taken robotics training or plan to take robotics training and want to begin new robotics programs and teams, or B) have sustained robotics programs/curriculum in their classrooms or at their schools.

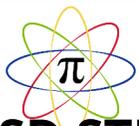


Application Deadline: January 5, 2022

Kelly Lane Earth and Space Science Grant

The Kelly Lane Earth and Space Science Grant (\$5,000) provided by the SD Space Grant Consortium is awarded annually to a select science or math teacher in South Dakota to enhance professional development. Awards are announced at the STEM Ed Conference in February.

Application Deadline: January 5, 2022



Don't Forget!
SD STEM Ed Conference 2022
February 3rd, 4th, & 5th

Exhibitor Registration Is Open for the 30th Annual SD STEM Ed Conference!

Do you know companies or organizations who may be interested in hosting an exhibit booth at the SD STEM Ed Conference? Are there organizations or companies that you would like to see as an exhibitor at the conference?

Please share the organization name and contact information with vendor@sdsta.org.

SDSTA Board Elections

According to the SDSTA Constitution (View the full document [here](#).), the Officers of the organization include President, President-Elect, Past President, Secretary, Treasurer, and Newsletter Editor. Officers are elected every other year and hold a two-year term. An elected officer may hold the same position for up to two consecutive election cycles. This February, at the Annual Meeting on February 4, at the Joint Conference, we will be electing the officers to serve from 2022-2024. In addition to the elected officers, there are Liaisons that serve on the Executive Board. This group of individuals is appointed by the President and is meant to represent a wide range of grade bands or affiliations in science education. Together the executive board determines the goals and visions of the organization and works with the Executive Board of the SD Council of Teachers of Mathematics (SDCTM) on the Joint Board to co-host the Annual SD STEM Ed Conference.

If you are interested in serving on the executive board of SDSTA, please email president@sdsta.org and let us know! We would love to know who's out there that wants to get involved. We would also love to know if you have a colleague that you would recommend/nominate to the Executive Board. We will accept your nomination by email and connect with the nominee to determine if they would be interested. Please join us at our Annual Meeting that will be held in Dakota E, at 4:30 pm at the Crossroads Event Center in Huron, South Dakota.



Officer Submissions

Sustainability Science Course at West Central HS - Jeff Peterson, SDSTA Liaison

Jeff Peterson and West Central Sustainable Science Class

In early 2000, a new branch of science entered our world's academia: sustainability science. This branch of science has the goal of finding agreeable, common sense solutions for problems we face as a society. Sustainable solutions focus on meeting social, economical, and environmental needs of our generation without compromising future needs. There are many complex problems in our world that are presenting a cost or concern for businesses, communities, and or societies. As a result, the need for trained professionals in the field of sustainability has become an established job market. SDSU, BHSU, Augustana, and USD have all recently launched programming that provides students an opportunity to pursue an interest in Sustainability Science.

For the first time, West Central students had the option to elect to be part of a project-based Sustainable Science Course this Spring Semester! Students spent their time researching, discussing and collaborating, reading and reflecting on current events, learning about and modeling nature's cycles, collecting data during field studies, and thinking about and reporting on sustainable solutions.

Over the duration of the course, students had many opportunities to visit Turtle Creek to collect data and make observations. Studies included determining water turbidity, flow, pH, oxygen levels, and temperature. In addition, students recorded and observed animal and plant diversity that was present, and picked and recorded trash within the zone.

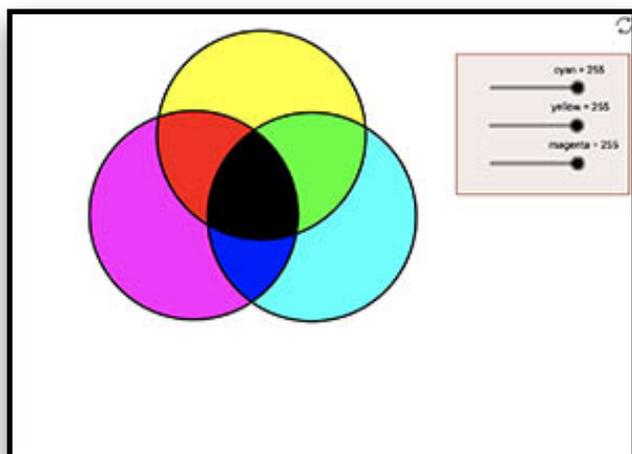
- **Learning and Sharing-** Being informed and spreading the word is one of the best ways to promote a more sustainable future.
- **Buy Local:** This benefits our economy and community members, but it also helps the environment. Ex. fuel usage, packaging pollutants.
- **Plant a Tree-** Trees promote air and soil quality. Fruit trees are especially impactful because they provide food to wildlife and people!
- **Contain and Pick Trash-** The amount of garbage in and around our creek is concerning. Garbage picking right after winter is especially impactful because it can prevent pollution from entering into the water system. Garbage picking can be fun and good exercise!
- **Mow Less vs More-** Especially if you have property next to a water system, consider leaving an undisturbed buffer zone. This can reduce labor and fuel costs. In addition, it provides habitat, reduces erosion, and collects/stops trash from entering water. In addition, more biomass will uptake more CO₂.
- **Explore Ways to Reduce Water and Electricity usage-** Saves you money and helps the environment.
- **Be Kind and Considerate-** Sustainability is all about finding ways to benefit everyone. The goal is to make the economy, environment, and society a better place!! Thinking about others' needs and opinions is essential to finding sustainable solutions.



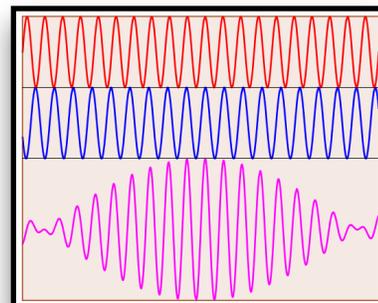
A big thanks to Robert McGehee and his crew at Arizona State for introducing instructor Jeff Peterson to Sustainability Science. If you are interested in getting training and having some fun, apply for Rob and Melani [Walton National Sustainability Teachers' Academy](#). This opportunity is not limited to only educators!

Officer Submissions

oPhysics: Interactive Physics Simulations - Julie Olson, SDSTA Newsletter



A collection of interactive physics simulations over a broad range of topics. I found them easy to visualize and manipulate. Students can easily manipulate color mixing, visualize capacitance, etc. There are drawing tools for graphings, vector addition, and circuits.



Sanford Underground Lab Modules - Julie Dahl, SDSTA Member

Reading, writing, calculating, and problem solving—these are some of the skills students use as they 'figure out' big science ideas. These units are designed to provide all learners the opportunity to engage in open-ended questions, work hands-on, and use their own observations as evidence to begin constructing explanations of phenomena.

Did I mention that our modules have been developed with input from teachers across the state and are aligned with South Dakota's K-12 Science Standards?

To find out more, or to request a module for use in your classroom, visit <https://www.sanfordlab.org/educators/curriculum-modules>



Underground Research Facility

South Dakota Science and Technology Authority

Move It! (K-2) - Using cause and effect to explore ideas about motion

Students will explore the motion of objects and manipulate the forces required to control that motion. Students also analyze data from tests of two objects

designed to solve the same problem to compare strengths and weaknesses of how each performs. As this unit comes to a close, students will examine push and pull forces at work at the Sanford Underground Research Facility.

Too Much, Too Little (3-5) - *Flood and Drought*

Students explore the phenomena of flood and drought as they analyze maps, graph weather data, and consider the water issues in their local communities. Students are then introduced to Sanford Lab's water dilemma and engineered controls, and then challenged with designing a solution to a local water issue of their choice.



Presidential Awards for Excellence in Mathematics and Science Teaching

Rewarding & Inspiring Great Teaching Since 1983



Call for Nominations

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the highest honors bestowed by the United States government specifically for K–12 science, technology, engineering, mathematics, and/or computer science teaching. Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of STEM education. Since 1983, more than 5,100 teachers have been recognized for their contributions to STEM education. Up to 108 teachers are recognized each year.

Presidential Awardees receive:

- A citation signed by the President of the United States
- A trip to Washington, D.C. to attend a series of recognition events and professional development opportunities
- A \$10,000 award from the National Science Foundation
- Access to a network of award-winning teachers from across the country

Who Can Nominate?

Anyone – principals, teachers, parents, students, or members of the general public – may nominate exceptional science, technology, engineering, mathematics, and/or computer science teachers.

NOMINATION DEADLINE: January 7, 2022

Nomination deadline: January 7, 2022

Application deadline: February 6, 2022

Who Can Apply?

Elementary school science, technology, engineering, mathematics, and/or computer science teachers (K–6) can apply this year. Secondary school teachers (7–12) will be eligible to apply during a future cycle.

APPLICATION DEADLINE: February 6, 2022

To nominate or apply, visit: www.paemst.org

The National Science Foundation administers PAEMST on behalf of The White House Office of Science and Technology Policy.

Officer Submissions

SDSU Physics Bowl XLVIII - Larry Browning, SDSTA Liaison

F2F and Virtual March 26, 2022

The Physics Department at SDSU would like to invite you to Virtual Physics Bowl XLVIII. It is intended to be a fun, exciting, and rewarding experience. There will be a F2F team competition in the morning, and then a virtual individual competition in the afternoon. This is an opportunity to make learning physics fun.

School Team Competition

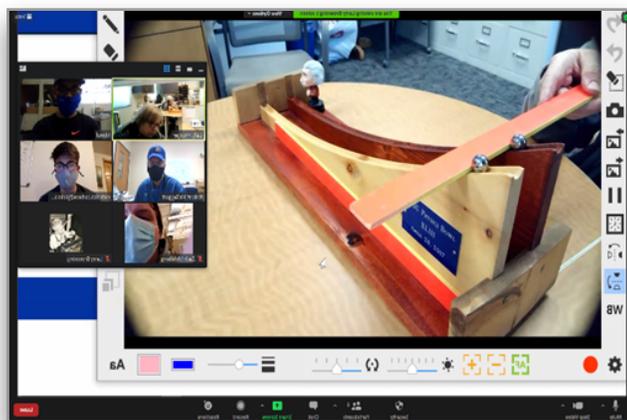
The morning event for the School Team Competition will be held from 9:30 am to 11:00 am CST on the SDSU Campus in Crothers Engineering Hall 204. Each school is eligible to enter one team up to 3 student members, to compete against other schools.

Individual Competition

The afternoon event for the Virtual Individual Competition will be held from 1:30 to 3:00 pm CST. Thirty participants will be eligible to compete. **Only those who did not participate in the School Team Competition will be allowed to compete in the afternoon event. Each participant will need to have access to a Smart Phone.**

For each of the competitions, winners are eligible for scholarships up to \$1000. All scholarships are valid on the condition the student enroll at South Dakota State University with a declared Physics major.

If you are interested in participating in the School Team Competition or the Individual Student Competition please contact us at: Sally.Krueger@sdstate.edu or sdsu.phys@sdstate.edu or call the Physics Main Office at 605-688-5428 for more detailed information.



Phun with Physics!

SD STEM Ed Conference February 3rd, 4th, & 5th

English Language Learner Resources - Lindsay Kortan, SDSTA Liaison



Onlinedoctranslator.com - This free website offers instant translation of your documents to over 100 different languages while maintaining the original layout and design. It supports translation of all major formats including pdf, Word, Powerpoint, and Excel.

The camera feature on the Google Translate app allows you to point your phone's camera at any text and have it instantly translated to your desired language. Share this app with your ELL students and their parents so they can translate assignments, messages and newsletters sent home or even signs around the



Officer Submissions

SD AAPT HS Photo Contest - James Stearns, SDSTA Treasurer

Photo Contest Details

The contest is open to high school students in grades 9-12 (or equivalent international grade level). Students must print out, sign, and return the Contest Rules and Entry Agreement, [HTML](#) version or [WORD](#) version, when submitting their entry. Failure to submit this form will invalidate the contest entry. (Photo, description, & entry agreement may be emailed to James@SDSTA.org.) Entries are limited to 6 per teacher per school each year. If possible, please place all entries from the school in one package.

Categories

Photos may be in one of two categories described below, and will be judged on the quality of the photo and the accuracy of the physics in the explanation that accompanies the photograph. Students may submit an entry in one (not both) of two categories:

- **Natural** — any situation that you saw occurring and photographed
- **Contrived** — a situation where the objects were manipulated to produce the phenomenon photographed



Suspension



Prizes

SD-AAPT will award cash prizes & certificates. (Usually given to the top three places only.)

Judging

The photos entered will be displayed and judged during the annual Winter Meeting at the SD STEM Ed conference or Joint Science & Math Conference in Huron in February. If more than 100 entries are received, a group of volunteer physics teachers will determine the 100 best entries to be displayed & judged in Huron. Failure to abide by all rules will result in disqualification.

Physics of the Photo



Frost

Deadline

This year's entry deadline is **January 1**.

Send submissions to:

James Stearns
15 North Fifth Street
Groton, SD 57445-2024

Questions

Please email James Stearns at
James@SDSTA.org



The Morning Surprise

Officer Submissions

Chemical Education Xchange - Alison Bowers, SDSTA Liaison

Calling all chemistry teachers! Do you ever feel like you are the one doing all of the talking in class? Feel like you're just telling students what they're supposed to know and helping them regurgitate? It may be time to find some new resources without having to reinvent the wheel. Chemical Education Xchange is an awesome place where you can share your best chemistry lessons and activities, as well as peruse great resources from other chem experts. When you create a free account, you get access to tips and suggestions from the educator who wrote the activity on how they use it in their classroom. There are inquiry activities, lab procedures, and more!



Can You Measure Moisture Content in Snow? - Ashley Armstrong, President-Elect



If you pay attention to the weather report in the next couple months, you're bound to hear the forecasters talk about the moisture content in the snow. Do you ever wonder where they come up with those predictions? According to research at Kansas State University (2018) the standard snow to measurable moisture ratio is 10:1, meaning 10 inches of snow is equal to 1 inch of moisture. Although this is an estimate, many discrepancies exist based on the temperature when the snow forms. Temperatures closer to 32 degrees Fahrenheit yield close to this 10:1 ratio, but colder temperatures (10-15 degrees Fahrenheit) yield much less. Some estimates may be as drastic as a 30:1 inches of snow to measurable moisture ratio.

Take your students outdoors to measure a fresh snowfall! Have them take the air temperature or look up the average air temperature throughout the snowfall. Based on the 10:1 and 30:1 ratios, have students make predictions about the moisture content based on the amount of snow and the temperature. According to the National Weather Service (2013), the best way to measure moisture content is to measure both the depth of snow and the water content. Snow depth can be measured using a precipitation (rain) gauge or by placing a ruler in the snow in an area free of wind or snowfall that can come off the roof. Then, allow the snow that fell in the gauge to melt, giving you the amount of precipitation. Add in a quick math lesson and have students calculate the ratio of your measured snowfall to moisture content.

Resource:

Kansas State University. (2018, February 21). *How Much Moisture is in that Snow?* No-Till Farmer. <https://www.no-tillfarmer.com/articles/7561-how-much-moisture-is-in-that-snow>

National Weather Service. (2013, September). *Snow Measurement Guidelines for National Weather Service Surface*

What do you call a photo of the North Pole?



A polar-oid



DAVIS-BAHCALL SCHOLARS

Join a three-week, fully supported summer program in the Black Hills that allows you to explore the world of modern scientific research at leading national and international laboratories and universities. The Davis-Bahcall Scholars Program is for students entering their first or second year of college. Scholars spend three weeks of their summer exploring the world of modern scientific research at leading laboratories and universities.

Application Deadline
January 21, 2022



What you get to do:



3 Week Experience (June 18 – July 10)



Guide Your Career Choice



Learn about STEM in SD and Beyond

Want to learn more?

Visit us online to learn more or to apply.

Requirements

- Be age 18 or older at time of travel
- Be a high school senior or college freshman at time of application
- Attend a South Dakota public, private or home school or postsecondary institution or have graduated from a South Dakota high school
- Have a demonstrated interest in science, with the intent of pursuing an advanced degree in a math, science, engineering or technology field

sanfordlab.org/dbs

Professional Development

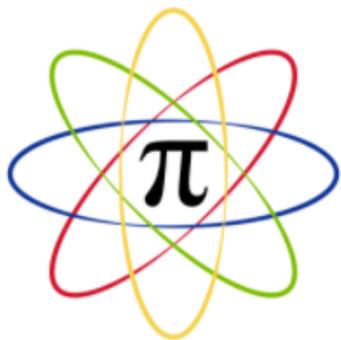
Summer 2022 SD EPSCoR K-12 Science Education Workshops

- If you have friends or colleagues who have not had a chance to experience the original biofilms virtual workshop (Fundamentals of 3D Science Instruction and Biofilms), it will be held **June 8 - 10** on Zoom. As before, a stipend of \$300 will be paid for full participation on all 3 days, and reduced rate graduate credit will be available through BHSU.
- The newest SD EPSCoR workshop will be held both face-to-face and virtually. This year's theme to guide learning is Leveraging the Power of Science Notebooking, Constructing Explanations, and Modeling to Engage Science Learners. New participants will receive the book *Ambitious Science Teaching* as part of the workshop, and all will receive a stipend of \$300 for full participation on all 3 days. Reduced rate graduate credit will be available through BHSU.
 - Face-to-Face Sessions: **July 6 - 8, July 12 - 14, and July 18 - 20**
(3 locations across the state TBD)
 - Virtual Sessions: **July 20 - 22**
- The final option for professional development generously funded by the SD EPSCoR grant is a focused workshop for implementing the EPSCoR Curriculum Units. Participants will come together to do a deep dive into a curriculum unit (6 options—2 at each grade band) and make plans for implementation in their own classrooms. Participants will receive a kit for their own classroom, plus a \$200 stipend for full participation on both days.
 - Workshops will be virtual and will be two-day blocks of time during the week of **July 25 - 28**.
 - Follow-up meetings will be scheduled throughout the school year as optional support. Those who take advantage of the follow-up meetings will be eligible for reduced rate graduate credit from BHSU.

Registration will open Tuesday, March 1, at sdepacor.org/teachers.



Participants will strengthen their understanding of three-dimensional science teaching and receive support in meeting South Dakota's K-12 Science Standards.



SD STEM Ed

SD STEM Ed Conference TOGETHER AGAIN!!

February 3, 4, & 5, 2022

MEET YOU AT THE CROSSROADS EVENT CENTER, HURON, SOUTH DAKOTA!



We want YOU to accept the challenge and JOIN the mission!

eCYBERMISSION is a free, web-based competition for students in 6th to 9th grade that promotes self-discovery and real-life applications of STEM. Working in teams, students choose a problem in their community to explore with science or solve with engineering while interacting with volunteer scientists and engineers.

REGISTER TODAY!



If you are...

- a STUDENT looking to further your STEM knowledge
- a TEACHER looking to encourage and challenge students
- a VOLUNTEER with a passion for STEM

There is a role at eCYBERMISSION for you!

REGISTER AT WWW.ECYBERMISSION.COM/REGISTER



eCYBERMISSION is part of AEOP, the Army Educational Outreach Program, which is committed to answering the Nation's need for increased STEM literacy and to expanding STEM education opportunities across the country to open doors to new career paths for American students.

Contact Mission Control at 1-866-GO-CYBER (462-9237) or missioncontrol@ecybermission.com for more information.

20
YEARS

eCYBERMISSION
ACCEPT THE CHALLENGE



For Educators



NASA EXPRESS
your STEM connection

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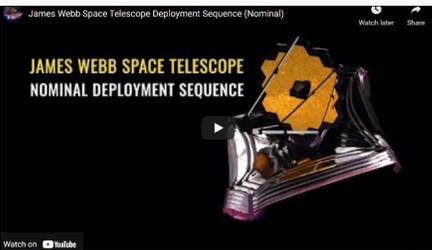
What's new?

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[NASA Sets Coverage, Invites Public To View Webb Telescope Launch](#)

NASA will provide coverage of prelaunch, launch, and postlaunch activities for the James Webb Space Telescope, the world's largest and most powerful space science telescope.



Video: James Webb Space Telescope Deployment Sequence (Nominal)

[More on the Webb Telescope](#)

The James Webb Space Telescope will find the first galaxies that formed in the early universe and peer through dusty clouds to see stars forming planetary systems. Learn more from the mission's project website.

NASA's Webb Telescope Will Have the Coolest Camera in Space

Set to launch on Dec. 22, NASA's James Webb Space Telescope is the largest space observatory in history, and it has an equally gargantuan task: to collect infrared light from the distant corners of the cosmos, enabling scientists to probe the structures and origins of our universe and our place in it.

Many cosmic objects – including stars and planets, as well as the gas and dust from where they form – emit infrared light, sometimes called heat radiation. But so do most other warm objects, like toasters, humans, and electronics. That means Webb's four infrared instruments can detect their own infrared glow. To reduce those emissions, the instruments have to be really cold – about 40 kelvins, or minus 388 degrees Fahrenheit (minus 233 degrees Celsius). But to operate properly, the detectors inside the mid-infrared instrument, or MIRI, will have to get even colder: less than 7 kelvins (minus 448 degrees Fahrenheit, or minus 266 degrees Celsius).

That's just a few degrees above absolute zero (0 kelvins) – the coldest temperature theoretically possible, though it's never physically attainable because it represents the total absence of any heat. (MIRI is not, however, the coldest imaging instrument ever to operate in space.)

Temperature is essentially a measurement of how fast atoms are moving, and in addition to detecting their own infrared light, the Webb detectors can be triggered by their own thermal vibrations. MIRI detects light in a lower-energy range than the other three instruments. As a result, its detectors are even more sensitive to thermal vibrations. These unwanted signals are what astronomers refer to as “noise,” and they can overwhelm the faint signals that Webb is trying to detect.

After launch, Webb will unfold a tennis-court-size sunshield that will block MIRI and the other instruments from the Sun's heat, allowing them to cool passively. Beginning about 77 days after launch, MIRI's cryocooler will spend 19 days lowering the temperature of the instrument's detectors to less than 7 kelvins.

“It's relatively easy to cool something down to that temperature on Earth, typically for scientific or industrial applications,” said Konstantin Penanen, a cryocooler specialist at NASA's Jet Propulsion Laboratory in Southern California, which manages the MIRI instrument for NASA. “But those Earth-based systems are very bulky and energy inefficient. For a space observatory, we need a cooler that is physically compact, highly energy efficient, and it has to be highly reliable because we can't go out and repair it. [Read more...](#)”

The NASA EXPRESS message features updates from NASA and STEM associates about workshops, internships, and fellowships; applications for grants or collaborations; promotions for student and educator opportunities; online professional development; and other announcements.

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UPCOMING EVENTS

December 22

James Webb Space Telescope Launch 
NASA

January 20

Goehring/Vietz Scholarships Due 
2022 SD STEM Ed Conference

January 24

Pre-registration Due 
2022 SD STEM Ed Conference

February 3-5, 2022

SD STEM Ed Conference 
Huron, SD

March 12

Newsletter Submissions due
Any member may submit lessons, ideas, links...

The SDSTA Newsletter is published four times a year and is e-mailed to 67 paid members. The membership year in SDSTA starts with the February conference and ends the thirty-first of January. Dues are due at each conference for member discount rates. SDSTA members may give a one year free membership to their student teachers by submitting the student teacher's name & address. One paid conference registration may be given to the SDSTA member that has made a submission to the newsletter (or given a presentation at the conference) and has referred at least three new members. Members may also earn a 10% finder's fee for any science related ads placed in the newsletter. Our rates are \$50 per page (or 3 to 4 quarter pages).



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