

Nebraska Science News



Nebraska Academy of Sciences



Nebraska Association of Teachers of Science

Serving Scientists and Science Educators Across the State of Nebraska

Fall, 2017-2018

Volume 21, No. 1

Published by the Nebraska Academy of Sciences

NATS PRESIDENT NEWS and VIEWS

I love the excitement of starting a new school year. The students are excited to share their summer experiences while dressed in their new clothes with happy smiles. The teachers are excited to have students in their newly decorated rooms and to share the knowledge that they gained over the summer with their inquisitive students.

Beginning this school year has been especially thrilling as we plan and prepare for the solar eclipse. This is a unique opportunity for our students to experience a natural phenomenon and then use their science knowledge to explain the event. Such an event leads me to examine how phenomenon can be used in our classrooms to teach necessary content. As we approach the Nebraska State School Boards approval of the Nebraska's College and Career Ready Standards for Science many science teachers across Nebraska may be asking similar questions and wondering how to go about the process. Ted Willard is a director at NSTA who helps teachers implement three dimensional framework standards. After listening to Ted Willard and Susan Koba present this summer I am extremely inspired about the direction the Nebraska's College and Career Ready Standards for Science will lead our science teachers and students. Ted Willard will be presenting at the [2017 NATS Conference](#) in Kearney, September 7 - 9.

Learning more about the art of teaching science is just one of the many reasons that attending the 2017 NATS/NATM conference is a must for you this school year. How many times do we go to a conference near the end of the year or during the summer and hope that we remember all the great stuff we heard so that we can implement it in the (continued on page 2)

FROM THE NAS PRESIDENTS' DESK

As the summer comes to a close I have been reflecting on the state of science in society. I believe it is more important now than perhaps ever before in U.S. history for us to strive to increase science literacy. When the scientific method is used to analyze information of all sorts, it becomes obvious what information or data is real and what is misleading. Science deniers reside across the political spectrum. For example, on the political right there are more deniers of climate change and evolution, while on the political left there are more deniers of vaccination, fluoride in water and biotechnology. We in the academy can, and perhaps *need* to do our part by communicating science effectively and accurately. Central to this responsibility is describing the scientific method to non-scientists – explaining how observations lead to hypotheses, allowing us to make predictions and test them with experimentation. If these data don't agree with a hypothesis, new hypotheses are made and the process begins anew.

In Nebraska we are uniquely positioned to make a difference in science literacy. One common thread in our state is that all Nebraskans are acutely aware of the role our state plays in producing food that helps feed the world. With the global population predicted to reach 9.1 billion by 2050, climate change decreasing the amount of land suitable for agriculture, and depletion of underground aquifers, feeding the world will become more challenging. The Food and Agriculture Organization of the United Nations predicts that food production will need to increase by 70% to meet the demand of the future population. Because of the stellar of agricultural productivity of our state, Nebraska will be front and center in addressing this grand challenge, and Nebraska scientists, educators, (Continued on page 2 – NAS President)

NAS President-continued from page 1

science students, and the agriculture community at large will need to step up and embrace this critical responsibility. It's probably not a big surprise that science – and the scientific method – will play essential roles in increasing our agricultural production. Agriculture is currently undergoing another innovative revolution in both aspects of productivity, the agronomic and genetic underpinnings that govern yield. In regards to the former, the area of precision agriculture has led to technologies for the reduction in agricultural inputs. What is this all about? It involves collecting all the data known about a producer's field and using the most modern technologies to grow crops as efficiently as possible. These data include information on soil, water, and nitrogen availability within even a single field. Drones and satellite imagery complement the data, and collectively all data are used to create informative maps to aid in a producer's decision making process. A new area of research that holds great promise towards improving aspects of precision agriculture is focused on gaining a better understanding of the microbiome – the collection of all the microorganisms in a particular environment. The study of microbiomes of many niches, including the human gut, is a blossoming area of research. To this end, two centers at the University of Nebraska are focused on this new research area of microbiomes, making Nebraska highly relevant in this area, and also providing many opportunities for science education and communication.

Recently, Nebraska scientists earned a \$20 million award from the National Science foundation's EPSCoR program to define the microorganisms associated with the roots of corn, with the hopes of identifying microbes that are beneficial to agriculture – perhaps by protecting crops against disease, or aiding in nutrient acquisition, or providing tolerance to drought. These microbes are collectively referred to as the root microbiome, and identifying them has been made possible by advancements in DNA sequencing technologies. The Center for Root and Rhizobiome Innovation (CRRI) includes scientists at the University of Nebraska–Lincoln, University of Nebraska Medical Center, University of Nebraska at Kearney, and Doane University. The center is charged with determining the root microbiome associated with corn and discovering compounds that corn roots release into the soil to maintain and/or recruit beneficial root microbiomes.

Another center established at the University of Nebraska in the past year is the Nebraska Food for Health Center (NFHC), a \$40 million initiative dedicated to improving the lives of people around the world. This initiative will bring together Nebraska agricultural and medical scientists to elucidate the components in foods that influence health and ultimately improve quality of life for people. Central to this effort is determining how different foods cause changes in the human gut microbiome and whether certain

diseases promote different gut microbiomes compared to the gut microbiomes of healthy individuals.

There are, of course, other Nebraska Centers that could be highlighted here, but the main point I wish to make is that these centers and others, position Nebraska to make great contributions to the grand challenges facing the world about the nexus of food, water and energy, over the next 25 years. Such Centers also create a conducive environment for interdisciplinary activities for scientists, educators, students, and producers to collaborate and help educate the people of Nebraska and beyond about the importance of science, the scientific method, and the impacts of scientific discoveries. While science will be faced with novel questions and new puzzles to solve, I believe there will be even greater opportunities for Nebraska scientists in the future.

In closing, it is my hope that all of us across the Nebraska academic community will make a concerted effort to participate in this challenge and each make a contribution-however small or large it may be- to make our state and country more scientifically literate. There is a lot of exciting science going on in Nebraska; Let's get to it!

Karin van Dijk, NAS President
University of Nebraska–Lincoln

NATS President-continued from page 1

upcoming school year? Having this conference at the beginning of the school year will provide an immediate opportunity for implementation. I love that NATS is in the fall and that I can return on Monday to my classroom with new ideas that are ready to go that day.

Teacher collaboration helps us to improve student learning. The NATS/NATM conference will provide teachers an opportunity to network and build collaborating relationships. This networking opportunity will provide teachers a chance to share ideas, partner with other teachers, get information, and create new contacts. This is a great opportunity to share your passion for teaching with like-minded individuals. Reconnecting with science teachers across the state is one of my favorite parts about the NATS conference and I am looking forward to meeting math teachers from across the state as well.

As much as we all love beginning a new school year we know that it can be a stressful time. The NATS/NATM conference is perfectly timed to refuel and recharge your passion for teaching. By mid-quarter we have established a relationship with our students and had an opportunity to evaluate their learning needs. At the conference you will have a chance to look for solutions, suggestions, and inspiration on how to meet your students learning needs.

If you haven't done so already now is the time to register for the NATS/NATM conference at the [NATS Website](#). I look forward to the learning, inspiring, networking, and collaborating the 2017 NATS/NATM conference will offer to us all.

Shauna Roberson, President
Garden County Schools

NATS PRESIDENT-ELECT NOTES

Welcome back! It is my hope that all of us have had a restful and relaxing summer break. The 2017-2018 school year is here, which alone should make this an exciting time. I am personally very enthusiastic both about the upcoming school year and the adoption of our new College and Career Ready Standards for Science. The new standards provide our students with the opportunity to take more ownership of their own education and are student driven, not teacher driven. These standards are also grade specific, which means student mobility and loss of content should not occur as often. It is my opinion that the new standards are going to help prepare our students for college and their careers.

It is difficult for me to imagine that I have been president-elect of the Nebraska Association of Teachers of Science (NATS) for almost one full year. Recently I was reflecting on how I got to the position that I am in today and many things came to mind. I want to discuss how the NATS organization has helped me become the professional that I am today. This organization and my membership in it has provided me with the opportunity to grow and learn from amazing colleagues from across the state. By attending the fall conference I was able to create relationships that I still maintain to this day. I found a place that allowed me to ask questions and continue to improve as an educator.

The new school year is upon us and with that comes our fall conference. This year we have joined forces with the Nebraska Association of Teacher of Mathematics (NATM) and are putting on a [co-conference September 7-9, 2018](#). This year's conference is titled "Mixing It Up In 2017" and will be held at the Younes Conference center in Kearney Nebraska. The conference will feature Derrick Nero as our keynote speaker. He will speak on Friday September 8, 2017. This year's conference will have a variety of different sessions and the outline of sessions will be coming out in the following days. This year we will have rooms specifically for STEM topics and also plan to have sessions to help educators gain knowledge about our new standards. I am very excited to make the change of locations and the opportunity to work with the math teachers.

Jodi L. Bahr (President-Elect)
Harvard Public Schools



NJAS NEWS

The Nebraska Junior Academy of Sciences is designed to promote science and technology in

Nebraska by providing incentives for students to apply creativity and critical thought to solutions of science, technology, engineering, mathematics, and engineering problems. It offers an opportunity for students to meet, exchange ideas, and discuss career possibilities with scientists and engineers from colleges and industries.

Students will develop a scientific research project, write an abstract of the project, and give an oral presentation the day of the fairs. Students will compete in two divisions: Grades 6-8 in the Junior Division and Grades 9-12 in the Senior Division. Each Regional Fair will select 6 junior and 6 senior high projects to advance to the State Science Fair. Judges at the State Science Fair will nominate ten Senior Division projects to attend the American Junior Academy of Sciences Conference.

The State Science fair will be April 19th 2018 at Nebraska Wesleyan University at the Weary Center.

For rules and forms visit:
www.nebraskajunioracademyofsciences.org

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thalkens@mpcc.edu

Randall Lienemann, NAS President

ACADEMY WEB SITE UPDATES

The NAS/NATS website is being renovated!

If you haven't checked it out recently, the NAS/NATS website has been undergoing some changes. Most of the work has involved cleaning up the pages and removing unused portions of the site. In the coming weeks we will be looking at adding features, updating the graphics and redesigning the layout.

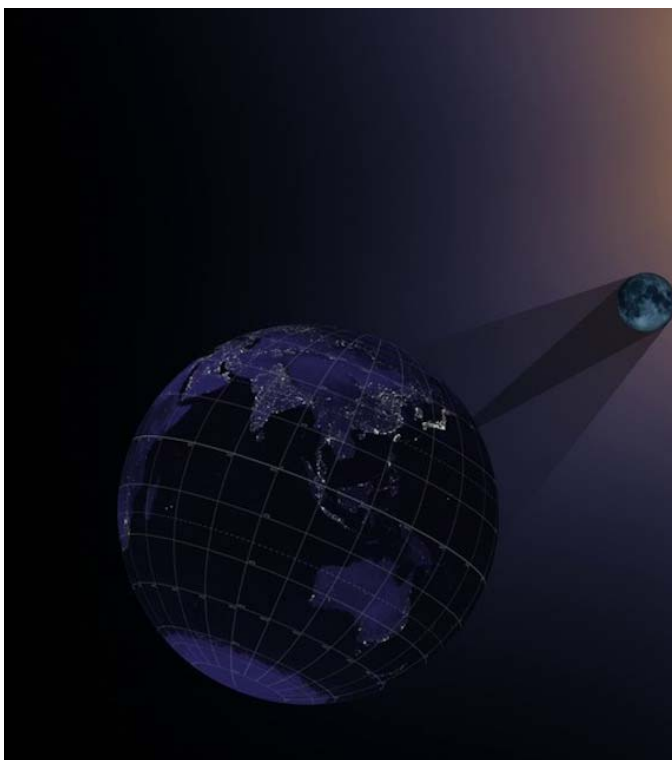
If you have thoughts about the website, we would like to hear them. Fill out the survey at: <https://goo.gl/sMwbx5>

OTHER NEWS AND EVENTS



How is the sun completely blocked in an eclipse?

On Monday, August 21st 2017, all of North America was treated to a total solar eclipse! This awe-inspiring sight occurs when the moon passes between Earth and the sun. Have you ever wondered how the moon manages to completely block the sun during an eclipse? Click on the image below to find out.



DATES TO REMEMBER:

[Registration Link for NATS Fall Conference – Sept 7-9](#)
September 7 – 9, NATS-NATM Fall Co-Conference
PIE Grant 4th Quar 2018 App Deadline – October 6, 2017
PIE Grant 1st Quar 2018 App Deadline – January 5, 2018
Collegiate Scholarship Deadline – February 1, 2018
Presenter Abstract Due Date – February 5, 2018
High School Scholarship Deadline – March 1, 2018
NJAS Spring State Science Fair – April 19, 2018
NAS Spring Annual Meeting – April 20, 2018
State Science Olympiad – April 21, 2018

PIE GRANTS REPORT

NAS has been approved to administer another three year grant cycle for the Nebraska Environmental Trust Public Information and Education Minigrant program. We are honored to be able to continue this very worthwhile program which provides small grants up to \$3000. These grants support the presentation and dissemination of information and perspectives that will stimulate enhanced environmental stewardship in any category eligible for Nebraska Environmental Trust (NET) funding. These categories are habitat, surface and ground water, waste management, air quality, and soil management. The grant expands dialogue on important current conservation topics and provides information on emerging or highly useful conservation methods. All Nebraska individuals, private organizations, and public entities are eligible to apply for these funds.

NAS received 11 applications for the second quarter of 2017. Nine applications were approved for funding: the Nebraska Recycling Council - Annual Awards Luncheon and Workshops; Omaha by Design - Neighborhoods USA Conference: Growing Green Neighborhoods Track; UNL - Students Promoting Diversity (in tree plantings); Prairie Pines Partners - Prairie Pines Nature Preserve "Second Saturdays" Nature Experience and Education Project; The Groundwater Foundation - Groundwater Education and Technology; Elkhorn Valley Museum - Our Wild Neighbors; Community Crops - Greening Your Home Workshop Series; Friends of Heron Haven - Environmental Education at Heron Haven, an Urban Wetland; and the Nature Conservancy - Prairie Perspectives: Seeing Nature with Drones.

Eight applications were received for third quarter evaluation and four were awarded funds. Applications received included the Nebraska Recycling Council – Recycling Hub and Spoke Workshops; Wachiska Audubon of SE Nebraska – Prairie Discovery Days; Alan Bartels, Children's Book: What's Going Down in Prairie Dog Town; Platte River Whooping Crane Maintenance Trust – Crane

Trust Educational Greenhouse; Nebraska Junior Academy of Sciences – Promoting Science Research in Nebraska; Prescribed Burn Task Force – Nebraska Prescribed Burn Education and Outreach; Southern Heights Food Forest, Building Groundwater Capacity; and the Douglas County Environmental Services – Stormwater Wizard. Recipients are the Nebraska Recycling Council, Wachiska Audubon of SE Nebraska, Platte River Whooping Crane Maintenance Trust, and the Prescribed Burn Task Force.

The Nebraska Legislature created the Nebraska Environmental Trust in 1992. Using revenue from the Nebraska Lottery, the Trust has provided over \$265 million in grants to over 2000 projects across the state. Anyone – citizens, organizations, communities, farmers and businesses – can apply for funding to protect habitat, improve water quality and establish recycling programs in Nebraska. The Nebraska Environmental Trust works to preserve, protect and restore our natural resources for future generations. <http://www.environmentaltrust.org>

Fourth quarter 2017 applications are due October 6, 2017.

Grant forms and information can be found on our website, www.neacadsci.org. Click on NAS and then click on Grants and Scholarships.



NAS SPRING ANNUAL MEETING

The Nebraska Academy of Science spring annual meeting will be held April 20, 2018. Abstracts may be submitted on line this year and payment via pay-pal is available. Abstract submission and registration will be available on line sometime after January 1st, 2018. Watch for updates on our website. This spring meeting is an excellent opportunity for students to present their research to their peers. These abstracts are published in a Proceedings which is available to libraries and on-line all over the world.

SCHOLARSHIPS

[Collegiate Scholarship](#) deadline is February 1, 2018. You can download the form on the website at any time. Teacher recommendations are needed as well as a nomination from an Academy member. There will be two \$1500 scholarships offered to juniors or senior in college. Money will be paid in two installments during the 2018 – 2019 school year.

[High School Scholarship](#) deadline is March 1, 2018. There are five scholarships available this year, from \$100 to \$1000.

Again you can check the website for links to the scholarship forms.

[NATS-NATM CO-CONFERENCE INFORMATION LINK](#)

The Nebraska Science News is a publication of the Nebraska Academy of Sciences, a private foundation associated with the American Association for the Advancement of Science.
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NJAS Acting President: Randall Lienemann
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Website: www.neacadsci.org Donations are tax deductible.

Nebraska Math & Science Summer Institutes (NMSSI)
& Department of Earth and Atmospheric Sciences

UNIVERSITY OF NEBRASKA-LINCOLN

GEOS 898: METHODS in GEOSCIENCE FIELD INSTRUCTION

Section 591

3 graduate credits

Summer Session, first 5-week session

mid to end June 2018



This section of GEOS 898 is directed toward in-service teachers. It comprises a 16-day, inquiry-based field course and a science immersion and discovery experience in Wyoming, Nebraska and South Dakota. The primary aim of this course is to improve educators' ability to teach inquiry, gain knowledge and understanding of geoscience, and to demonstrate effective teaching methods that can integrate geoscience into K-12 learning environments.

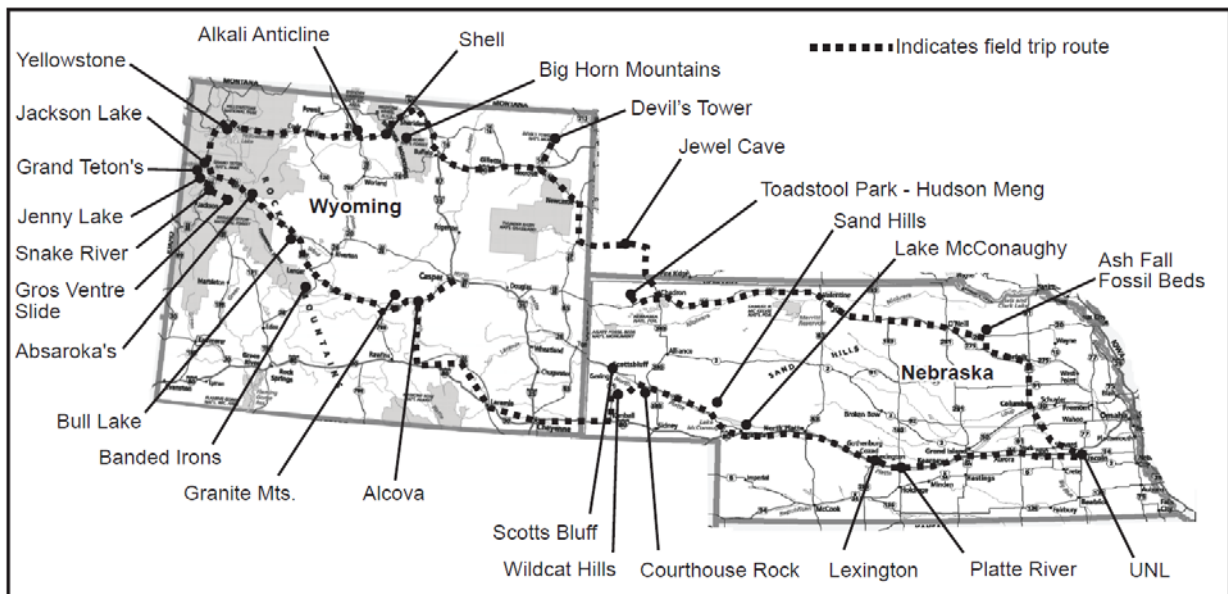
What recent teacher-participants said about their experience:

"I have never learned or done so much in 2 weeks ever in my life." "I felt like I was on 'Survivor', and I was succeeding."

"I'm inspired to continually bring up opportunities for wonder in my students."

"This is truly the best course I have ever taken. I learned more about geology, myself, others, life, etc. than I ever have or could have in one year."

- Goals:**
- To enhance the 'geoscience experience' for in-service science educators and their students;
 - To teach inquiry concepts and skills that K-12 educators are expected to understand and employ;
 - To inspire science educators to use inquiry and geoscience as unifying themes in their teaching activities;
 - To provide all participants with a 'tool-kit' of effective inquiry-based teaching practices.



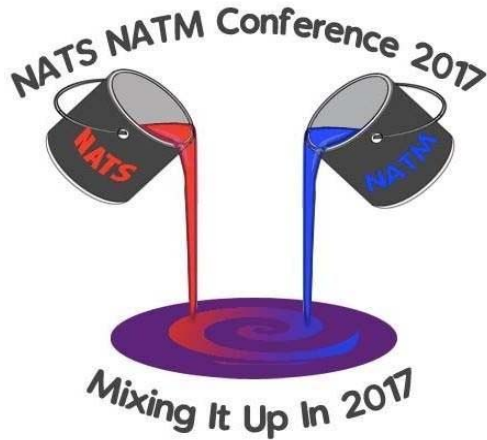
Details: All costs for transport, food, and accommodation will be covered by UNL. In short, you will get a fantastic trip, three graduate credits, and amazing exposure to geoscience for less than you would pay for an on-campus course (tuition is adjusted to a 80% rate). Scholarships to support costs of tuition (~\$300) are available from the Department of Earth and Atmospheric Sciences through an approved application.

Watch a short video produced by NET that describes the course and presents teacher perspectives:

<https://www.youtube.com/watch?v=pm3IPNPEaCA>

Visit: <http://scimath.unl.edu/nmssi/> for more info, and contact Dr. David Harwood at ddharwood1@unl.edu

2017 NATS/NATM FALL CONFERENCE



Schedule: Thursday, September 7 – 4:30 – 8:00
Friday, September 8 All Day
Saturday, September 9 8:30 – 12:00

Younes Conference Center, Kearney, NE

Hotel Reservations: Make Your Own

Fairfield Inn (308) 236-4200 \$91.50/night

LaQuinta Inn (308) 237-4400 \$91.50/night

Meals:

Thursday Evening: Light Snacks and Drinks

Friday Breakfast: Complementary in your hotel

Friday Lunch: Buffet provided by conference

Friday Dinner: On Your Own

Saturday Breakfast: Complementary in your hotel

Coffee and Rolls for the Saturday am groups

Registration Available on line

<https://nebraskaacademyofsciences.wildapricot.org/page-1228210>

Or Register on the back and email to

nebacad@unl.edu

or fax to

402-472-8899

Or mail to

NATS

302 Morrill Hall, 14th and U Streets

Lincoln, NE 68588-0339

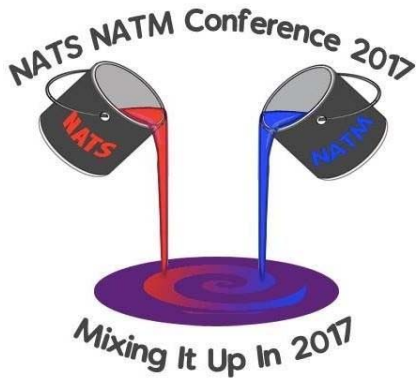
KEYNOTE SPEAKER

Derrick A. Nero



Derrick A. Nero is the K-12 Engineering Education Instructor in the University of Nebraska at Omaha College of Education (UNO COE). Derrick has a Bachelor's degree in Electrical Engineering and has worked as an engineer and project manager for Raytheon Services Nevada and Bechtel Nevada. He earned a master's degree in Special Education and worked in alternative education and STEM education for 11 years. During those years, he created and taught a STEM elective course for nine years. He worked collaboratively with UNO COE and the University of Nebraska-Lincoln (UNL) to develop and implement the use of robotics as an educational platform.

Derrick teaches and develops teacher education courses for undergraduate teacher candidates and engineering education courses for graduate candidates. He serves as a Nebraska Department of Education STEM Fellow, co-facilitator for the UNL Engineering Readiness Academy and the Nebraska NASA Space Grant Project HALON, developer for the Nebraska Robotics Expo, and advisor for various STEM outreach initiatives such as Space Celebration Night, Family Engineering Night, and STEM Days, and student groups such as Latin@s in STEM, Noyce Scholars, and UNO Echo. Derrick's research interests include K-12 Engineering Education, authentic learning experiences, and engaging underrepresented groups. He is attaining his Doctorate in Educational Leadership with a focus on STEM Education.



NATS NATM Fall Conference 2017

Register Here:

- _____ \$110 Individual Registration
_____ \$ 50 Pre-service teachers and students
_____ \$270 District teaching teams (1 math, 1 science
1 administrator) use an extra sheet for
team information

Name: _____

Address: _____

City, St, Zip: _____

Phone: _____

Email: _____

T shirt size: S___ M___ L___ XL___ XXL___ XXXL___

School: _____

School Address: _____

School City, St, Zip: _____

School Phone: _____

Payment Info: P.O. No. _____

or

Credit Card No. _____

Credit Card Exp Date: _____ 3 digit code _____

CC Address: _____

CC Zip Code: _____

Teaching Assignment

- Math
 Science
 Administration
 Other (industry, community, etc.)

Grade Levels

- Elementary
 Middle/Junior High
 Senior High
 Higher Education
 Informal or Community Educator
 Other

May we use pictures of you taken at conference?

- Yes
 No

Have you received any teaching awards in the last 12 months?

Are you interested in running for a board position?

- Yes for NATS
 Yes for NATM
 No
 Undecided

What is your favorite science or math resource?



THE NEBRASKA ACADEMY OF SCIENCES, INC.
(Founded January 30, 1880)
128th ANNUAL MEETING TO BE HELD
at
NEBRASKA WESLEYAN UNIVERSITY
50TH and ST. PAUL, LINCOLN, NEBRASKA

FRIDAY, APRIL 20th, 2018

"Call for Papers"

**ABSTRACTS, FORM, AND FEES ARE DUE TO SECTION CHAIRPERSONS
FEBRUARY 5, 2018**

Individuals are invited to submit an abstract of original research or synthesis of primary research/literature for consideration by one of the sections for inclusion in the Program of the Annual Meeting of the Nebraska Academy of Sciences. You may also complete your presenter registration on line using the Events tab on the NAS website. Be advised if your abstract contains any special characters or formulas you may be requested to submit a hard copy as well.

Annual Meeting Presenters may also want to consider submitting their complete research articles for review and possible publication in the Transactions of the Nebraska Academy of Sciences. Papers from all sections are eligible. Contact the Academy office for publication information.

Section chairs will forward all documents they receive to the Academy, nebacad@unl.edu by February 19th. Any online registrations will be shared with the section chairs so they can complete their program schedule.

To register online go to <https://nebraskaacademyofsciences.wildapricot.org/page-1228210>

or contact

THE NEBRASKA ACADEMY OF SCIENCES
302 MORRILL HALL, 14TH AND 'U' STREETS,
LINCOLN, NE 68588-0339
TELEPHONE (402) 472-2644
FAX (402) 472-8899

EACH ABSTRACT MUST BE ACCOMPANIED BY A \$70.00 REGISTRATION FEE (\$15.00 FOR STUDENTS—COPY OF VALID STUDENT ID MUST BE ENCLOSED) FOR THE PERSON PRESENTING THE PAPER. PLEASE COMPLETE CONTACT INFORMATION ON THE REGISTRATION FORM OR ON LINE ACCURATELY AND LEGIBLY. FORM IS AVAILABLE ON OUR WEBSITE: <https://nebraskaacademyofsciences.wildapricot.org/NAS>

- 2. MAKE CHECKS PAYABLE TO THE NEBRASKA ACADEMY OF SCIENCES or NAS.**
- 3. AUTHORS SUBMITTING MORE THAN ONE ABSTRACT SHOULD PAY ONLY ONCE.**