

# IGNITING THE PASSION FOR SCIENCE



**October 6-7, 2019**

Iowa Academy of Science  
Iowa Science Teaching Section  
DMACC Ankeny

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Help promote science research, science education, the public understanding of science, and recognize excellence in these endeavors by becoming a member of the Iowa Academy of Science.

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## DES MOINES AREA COMMUNITY COLLEGE

DMACC offers over 200 degrees, diplomas and certificates as well as continuing education and online programs. In addition to the 6 main campus sites there are several additional satellite classrooms in the Des Moines area .



## SCIENCE CENTER OF IOWA

Centrally located in Downtown Des Moines, SCI features hands-on exhibits, special-format theaters and unique programming to encourage learning and fun for all ages. Through daily visitors, a statewide educational outreach

programs and the NAEYC-accredited SCI Preschool, the Science Center of Iowa serves more than 300,000 people annually.

# JOIN IAS AT THE 2020 ANNUAL MEETING

132th Annual Meeting Iowa Academy of Science  
and the 88th Meeting of the Iowa Junior Academy of Science

Fri, Apr 17, 2020 7:30 AM -

Sat, Apr 18, 2020 4:00 PM

Drake University, Des Moines



Times and rooms for individual breakout sessions in this program are subject to change.

# MONDAY SCHEDULE

8:00 - 8:15 Opening	Room 106 - 107				
	Rm 108	Rm 109	Rm 112	Rm 113	Rm 114
Breakout #1 8:15 - 9:00		J Ploegstra The importance of statistics and computational thinking for the "New Biology"	J Krysinski Claim-Evidence-Reasoning: Scientific Explanations to Increase Student Voice (Grades 3-12)	T Askeland/C Like/ M Trimble A Learning Walk Tool for Science Teachers and Instructional Coaches	Y Verhoeven Inquiry, Engineering Practices, & Equitable Sensemaking With Gummy Bear Catapults
9:00 - 9:30	AM Exhibit Hall				
9:00 - 9:30	<b>EXPO!</b> Room 106 - 107 See page 10 for more information <b>EXPO!</b>				
Breakout #2 9:30 - 10:15	Lab-aids D Christianson Prospecting for Mineral Ore	J Ellis/N James/C Sis/ S DeCoster Turn Your Gears: Every Student Can Engineer	J Krysinski Use Phenomena to Make Gains in Student Inquiry (Grades K-12)	T Askeland-Nagle Planning Science Instruction with the Universal Constructs in Mind	Y Verhoeven Cross-curricular Inquiry Cubes as Phenomena to Ignite Curiosity
10:15 - 10:45	AM Exhibit Hall				
10:15 - 10:45	<b>EXPO!</b> Room 106 - 107 See page 12 for more information <b>EXPO!</b>				
Breakout #3 10:45 - 11:30	SAM Labs Inc J Danley Hands-On, Minds-On STEAM Lessons!	J Ellis/N James/C Sis/ S DeCoster Authentic Texts: What Are They and How do I Use Them in the Middle Grades?	J Krysinski Using Argumentation to Discuss Phenomena (Grades 3-12)	T Askeland-Nagle Open Education Resources to Support the Iowa Science Standards	Y Verhoeven Mythbusting Labs that Demonstrate the Nature of Science
Breakout #4 11:30 - 12:00	J Bliss What? I Have a Blind Student in my Classroom!	P Carlson How to get into the National STEM Scholar Program	D Jacobson Merging Science and Art Through Inks	C Hall The Science of Iowa Agriculture	M Kuhn, R Rinehardt Improving Students' Science and Engineering Practices by focusing on Executive Function Skill Development
12:00 - 1:15 Lunch, Awards & Keynote	Room 106 - 107				
Breakout #5 1:15 - 2:00	Science Center of Iowa P Rice The Science Center Sampler	C Carney/ B Ehlers/ J Monteith/ K McCarville Environmental Heroes: Water Connections Us All	J Krysinski Use the 5-Es to Provide Equity to Science Instruction	C Like/ A Bohnert Gaining a Student Perspective of NGSS	D Krefting/ M Wicklund Encourage Passion by Differentiation and Personalization for ALL Students
2:00 - 2:30	PM Exhibit Hall				
Breakout #6 2:30 - 3:15	Iowa Limestone Producers, BMC Aggregates S Lundy The Earth Has a History	S Short/B Montgomery /S Baumgartner / M Bechtel Educational Aquaponics	D Voss Making Storylines Work: Mindset and Tips for 3D Teaching	C Like / M Grannen The Physics of a Cell Phone- A Complete NGSS Unit	D Krefting/ M Wicklund Adding Blending or Flipping Options to Your Classroom
Breakout #7 3:15 - 4:00	Lab-aids D Christianson Chemical Reactions: Designing Better Chemical Batteries	M Bechtel Biophilia in the Classroom	M McDermott/ W Hansen Planning for Immersive Argument-based Science Learning Environments	H Garcia Chemical Bonding and "Rainworks" Sidewalk Art	W Llamas/ J Otten The World Famous Iowan that Most Iowans Know Nothing About
4:00 - 4:10 Closing	Room 106 - 107				

Rooms and times are subject to change.

# MONDAY SCHEDULE

8:00 - 8:15 Opening	Room 106 - 107					
	Rm 115	Rm 116	Rm 208	Rm 209	Rm 212	Rm 213
Breakout #1 8:15 - 9:00	I Kent-Schneider/ C Gilbert/ J Kruse A Fresh Taste to Learning Energy Conversions	D Atwood-Blaine Using Location- Based Mobile Games to En- hance Field-Trip Engagement and Effectiveness	T Miceli/ J Vander Wilt Non-Visual Differ- entiation in the Science Class- room: A Multi- sensory Approach	A Soemadi Quadratic function: connecting physics to mathematics i	P Joselyn Launching the Design Process	
9:00 - 9:30	AM Exhibit Hall					
9:00 - 9:30	<b>EXPO!</b> Room 106 - 107 See page 10 for more information <b>EXPO!</b>					
Breakout #2 9:30 - 10:15	E Henry/ J Kruse Year-Long Shad- ow Investigation	B Watson Environmental Internship	P Steffen/B Gigar Students in the Lead: Real-World Data and Game Design	J Lang Iowa STEM Teacher Extern- ships	W Fett Bioengineering - Crops of the future	T Plein OpenSciEd: Open Education Re- source for Middle School Science
10:15 - 10:45	AM Exhibit Hall					
10:15 - 10:45	<b>EXPO!</b> Room 106 - 107 See page 12 for more information <b>EXPO!</b>					
Breakout #3 10:45 - 11:30	J Wilcox/S Nolt- ing/ N Moore/M Grenko Shining a Light on Elementary Inquiry Experi- ences	A Schiller-Haynes/ JS Smith Literacy in the 6-12 Science Class- room	M Wedge/ K Wedge Forget Lab Re- ports! Switch to Writing Scientific Claims.	K Turner/A Turner Engineering De- sign: Start an En- gaging, Relevant, Hands-on, STEM Activity Today!	S Wendt/D Tibben/ J Dixon The Science Fair: Passionately Sup- porting Curricula Standards and Having Fun	K Burns/SK Howe Modeling Ecosys- tems in a pop bottle
Breakout #4 11:30 - 12:00	E Henry/ J Kruse Disciplinary Liter- acy in Science	T Morgan/ B Bauer Teachers Create and Share Local Phenomena with IPTV Pilot Project	N Perkinson/ L Hugi Igniting Passion in Students through Multifaceted Col- laboration between Institutions	M Trent Forming STEM Community Part- nerships	T Reichert Con- necting the NGSS to the World Food Prize and Beyond	K Burns Getting Students Outdoors to Solve Real Problems
12:00 - 1:15 Lunch, Awards & Keynote	Room 106 - 107			Luncheon Keynote		
Breakout #5 1:15 - 2:00	E Jorgenson/ J Kruse Pop Cans and Particle Motion	T Morgan IPTV's Iowa Land and Sky: Geology, Biodiversity and Environmental Issues	B VanMeeteren Encouraging Stu- dent-Led STEM Investigations in Early Elementary	J George/ N George Playing Games, Posing Questions and Discovering Answers Through Data Analysis	L Escalada/ J Morgan UNI Physics Teaching Endorse- ment Program	J Easter/ M Green/ C Seebach Integrating Engi- neering in a Mid- dle-Level Sound Unit
2:00 - 2:30	PM Exhibit Hall					
Breakout #6 2:30 - 3:15	L Chizek Elementary Sci- ence Teachers Discussion Ses- sion	D Gee Creating a "Big District" Science Program in a "Small" District	A Appley/ H Allen/ R Hanson Shifting Grading Practices Using SEPs	E Schiller Rebuild Nepal Education Project with fellow U of Iowa Volunteers	L Flynn/ N Aver- kamp-Haken/ R Crady/ G Trane STEM Innovator: Transforming Classrooms into Centers of Innova- tion	J Easter/ S Mulder/ K Belcher/ H Ederly Ladybugs and Genetic Variation
Breakout #7 3:15 - 4:00	C Schaffer Science/Math Inte- gration for a Sus- tainable Planet	J Maroo Science Olympiad and Your School	M Sanderman Measuring NGSS Implementation	K Van Hoeck Evolution for Educa- tors	K Roberts/ J Wilcox/ A Bahnson Engaging Urban and Suburban Students in Nature Using Place- based Learning	
4:00 - 4:10 Closing	Room 106 - 107					

Rooms and times are subject to change.

# WELCOME



Welcome to the Iowa Science Teaching Section Conference for 2019! My name is Jesse Wilcox and I'm honored to serve as the Chair and Conference Chair. The theme for this year's ISTS conference is *Igniting the Passion for Science*. We selected this theme to pay tribute to the 50<sup>th</sup> anniversary of Apollo 11 and to serve as a reminder of the important roles all of you have in igniting passion for science in your students from K through college.

My hope is you take advantage of all of the great things the ISTS conference has to offer including: presentations, expo, exhibitor hall, and connections with colleagues from across the state. Thank you for attending and have a great day!

Jesse Wilcox, Ph.D.

Assistant Professor of STEM Education at Simpson College

Chair and Conference Chair of the Iowa Science Teaching Section

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## Meet the ISTS Chair-Elect:

Dr. Jaclyn (Jaci) Easter grew up on a farm in southwest Iowa, where her love for science and nature first began. She attended Simpson College, and received Bachelor's degrees in biology and psychology. After spending time in the mental health field, working with young adolescents in a psychiatric treatment facility, Jaci became passionate about helping all students find the joy in learning, particularly science.

She received her Master of Arts in Teaching from Drake University, where she first got involved with ISTS as a pre-service teacher. Jaci taught science at both the high school and middle-level, and continued to be an active participant in ISTS and other science teaching organizations, presenting 35 times since that first fateful ISTS presentation. Jaci has received the Maitland P. Simmons Award for science teachers through the NSTA, and the North Central Association for Science Teacher Education Graduate Student Research Award. Jaci received her Ph.D. in Education (Science) from Drake University and now teaches science education courses at Grand View University.



Jaci is excited to serve to the organization that has given her so much over the years. Please say hello to our new ISTS Chair when you see her at the conference.

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Welcome to the 2019 ISTS Fall Conference. I hope you enjoy the conference and find the information you receive to be informative and time well spent. The Iowa Science Teaching Section of the Iowa Academy of Science has once again put together an excellent conference with many opportunities to meet other science professionals and learn new ideas to use in your classroom.

The Iowa Academy of Science is Iowa's general science organization and ISTS is one of twelve science-related sections. If you are not familiar with the Academy, please visit our website at [www.scienceiniowa.org](http://www.scienceiniowa.org). Learn about opportunities for you to lend your expertise to advance science in Iowa outside your normal professional life. We try to find ways for you to participate within your busy schedule. Learn about the other eleven section in the Academy and how you can join them. Meet new people and friends from across Iowa in the Iowa Academy of Science.

Thanks for attending! We are glad you are here.

Craig Johnson  
Executive Director  
Iowa Academy of Science



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**Thanks to the ISTS Planning Committee and Leadership Team for their help in putting together this conference:** Craig Johnson and Cory Johnson from the Iowa Academy of Science Office; Jesse Wilcox, chair; DeEtta Andersen; Lisa Chizek; Tom Ervin; Barbara Jacobson; Traci Maxted; and Ken Turner

# PRE-CONFERENCE EVENTS

**Sunday October 6**

**5:30 PM–9:30 PM**

## Science Center of Iowa

401 West Martin Luther King Parkway, Des Moines, Iowa

Join us in a welcoming event



**SCIENCE  
CENTER  
OF IOWA**  
& BLANK IMAX®  
DOME THEATER

5:30pm-6:00 Registration

6:00pm Welcome **John Deere Theater** (1<sup>st</sup> level)

6:15pm **Physio Lab** (1<sup>st</sup> level) Kindergarten or HS, It's Time for  
a Break: Materials Science and Engineering Design

Dr. Ken Turner, University of Dubuque

**Commons** (1<sup>st</sup> level) Making Sense of Socio-  
Scientific Issues

Dr. Jerrid Kruse, Drake University

7:00pm Small Group Activity in **Founders Hall** (1<sup>st</sup> level)

7:45pm Planetarium Program in Star Theater

8:10pm Reception/Social Hour in Founders Hall

9:00pm Pre-Conference Ends

Enjoy a chance to network with other science teachers  
and explore the Science Center of Iowa.

Appetizers and a cash bar will be included.

## *Iowa Junior Academy of Science*

The Iowa Junior Academy of Science provides resources and programs for 6th-12th grade science students and their teachers/parents. IJAS promotes individual and small group student research, awards, scholarships, and extra-curricular activities to broaden a student's science experiences.



**Visit the IAS Booth for more information and to join.**

# Monday October 7

- 8:00 - 8:15 Opening
- 8:15- 9:00 Breakout Session 1
- 9:00 - 9:30 Exhibit Hall/ EXPO!
- 9:30 -10:15 Breakout Session 2
- 10:15 - 10:45 Exhibit Hall/ EXPO!
- 10:45 - 11:30 Breakout Session 3
- 11:30- 12:00 Breakout Session 4
- 12:00 - 1:15 Lunch, Awards and Keynote
- 1:15-2:00 Breakout Session 5
- 2:00-2:30 Exhibit Hall
- 2:30 - 3:15 Breakout Session 6
- 3:15- 4:00 Breakout Session 7



## Igniting the Passion for Science: Symbols for Conference Themes:

- (inc) Igniting the Passion for all: The inclusive science classroom
- (place) Igniting the Passion Beyond the Classroom: Place-based Science (Informal science, field trips, outdoors)
- (3D) Passionately Teaching Science in 3D
- (imp) Keeping the Passion Going: Continuously Improving Science Teaching
- (STEM) Passionately Teaching STEM/Interdisciplinary





# SESSION 1 8:15 - 9:00

<b>Room 109</b> <i>The importance of statistics and computational thinking for the "New Biology"</i>	HS: imp,STEM	Learn about and discuss tools and resources to integrate critical statistical concepts into highschool biology classes and improve student success and and persistence in STEM.	Jeffrey Ploegstra Dordt University
<b>Room 112</b> <i>Claim-Evidence-Reasoning: Scientific Explanations to Increase Student Voice (Grades 3-12)</i>	E,MS, HS: STEM	CER is an acclaimed and highly successful instructional strategy that is changing how students understand concepts and write explanations for observed phenomena.	Jill Krysinski STEMscopes / Accelerate Learning
<b>Room 113</b> <i>A Learning Walk Tool for Science Teachers and Instructional Coaches</i>	E,MS, HS: imp	Come see how teachers, instructional coaches, and consultants have used the Iowa Science Standards Implementation IC Map as a learning walk tool.	Tammy Askeland-Nagle, Mississippi Bend AEA, Chris Like, Bettendorf CSD, Melissa Trimble, Davenport CSD
<b>Room 114</b> <i>Inquiry, Engineering Practices, and Equitable Sensemaking With Gummy Bear Catapults</i>	E: inc, 3D, imp,STEM	With gummy bear catapults, this hands-on lab/workshop demonstrates inquiry-based equitable ways to teach Science and Engineering Practices (SEPs) and Crosscutting Concepts (CCCs) from the NGSS.	Yen Verhoeven Qi Learning Research Group
<b>Room 115</b> <i>A Fresh Taste to Learning Energy Conversions</i>	MS: imp	Teaching energy doesn't have to be bland. Starting with more basic energy sources we help students see how fruits can be used in electrical circuits.	Isaiah Kent-Schneider, Cade Gilbert, Jerrid Kruse, all: Drake University
<b>Room 116</b> <i>Using Location-Based Mobile Games to Enhance Field-Trip Engagement and Effectiveness</i>	E,MS, HS: place	ARIS allows non-programmers to create free location-based games. See how you and your students can harness this powerful tool to enhance learning outside the classroom.	Dana Atwood-Blaine, University of Northern Iowa
<b>Room 208</b> <i>Non-Visual Differentiation in the Science Classroom: A Multi-sensory Approach</i>	E, MS: inc, 3D, imp,STEM	Students of differing abilities deserve equal access to education. Often, teachers are unsure how to adapt course material to specific needs, especially in the sciences.	Tori Miceli, Wartburg College Johanna Vander Wilt Wartburg College
<b>Room 209</b> <i>Quadratic function: connecting physics to mathematics</i>	MS, HS: imp,STEM	Simple and complicated dynamics can be formed using quadratic function.	Andreas Soemadi North Iowa Area Community College
<b>Room 212</b> <i>Launching the Design Process</i>	MS, HS: 3D	Launching the design process while emphasizing the significance of computational thinking and mathematics in the construction of a security system using lasers, photoreceptors, and mirrors.	Pamela Joslyn Muscatine CSD



Join other Iowa science teachers in sharing great ideas in a more informal setting.





**EXPO 1**  
9:00-9:30



<i>Keeping Soil in It's Place</i>	Discover the impact of splash erosion on bare soil and learn about methods used to help keep soil in its place.	E: imp	Cindy Hall, Iowa Agriculture Literacy Foundation
<i>Light &amp; Shadow: A Context for Developing Spatial Thinking and Properties of Materials</i>	Explore how Light & Shadow experiences address spatial thinking.	E: inc	Beth VanMeeteren, University of Northern Iowa
<i>Using a Card Trick to Introduce Argument-based Learning</i>	Engaging students in developing an explanation for a card trick can introduce critical characteristics of NGSS-aligned, immersive argument-based learning.	E,MS,HS: 3D	Mark McDermott, University of Iowa
<i>Engineering a Pancake Recipe: Connecting Chemistry to Everyday Life</i>	Create an appetite for science your students with an "Engineering a Pancake Recipe" design process that makes the structure and properties of matter more meaningful.	E: 3D	Lisa Chizek, University of Northern Iowa
<i>Checkout STEM: Increasing Access To STEM-Literacy Learning</i>	Checkout STEM was created to expand access to STEM and literacy experiences for K-3 children. Learn how you can start your own STEM-literacy backpacks!	E: place	Sara Nelson, Iowa State University
<i>Astronomy in the Elementary Classroom (through the NASA/IPAC Teacher Archive Research Program)</i>	The NASA/IPAC Teacher Archive Research Program (NITARP) gets educators involved in authentic astronomical research by partnering educators with a research astronomer for a year-long research project.	E: imp,place	Hannah James, Wartburg College, Johanna Vander Wilt, Wartburg College, Jennifer Wiley, Wartburg College,
<i>Hands-on biology-based activities for middle school students</i>	Hands-on activities offered by Mobile Lab are simplified experiments from two lab courses at Biology of the University of Iowa, Human Biology and Animal Behavior.	MS:	Olga Miakotina University of Iowa
<i>The ASSIST Approach: Using Inquiry as a Learning Tool and Outcome</i>	This session will focus on thinking about inquiry as a process for learning and epistemological nature of scientific knowledge. We will have links to our free curriculum which include student thinking logs and links to resources.	E,MS,HS	Mason Kuhn Dana Atwood-Blaine University of Northern Iowa

**Remember to allow time to visit the Exhibition Hall!**

Do you have information that you want to get out to the science teachers of Iowa?  
Exhibit in the exhibit hall at the ISTS Fall Conference.  
Commercial and non-commercial booths available.  
Please contact the Iowa Academy of Science at [ias0001@uni.edu](mailto:ias0001@uni.edu)

# SESSION 2 9:30 - 10:15

<b>Room 108</b> <i>Prospecting for Mineral Ore</i>	HS: inc, STEM	How do geologists look for mineral ore? In this activity from EDC Earth Science, participants search for a layer of rock containing a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems—gathering data to decide where the deposit is located. This is no “cookie mining” activity!	Darin Christianson Lab-aids
<b>Room 109</b> <i>Turn Your Gears: Every Student Can Engineer</i>	E,MS,HS: imp	A new twist on the typical Science Fair, but ENGINEERING!	Josh Ellis, Nicole James, Carly Sis, Stacy DeCoster, Grinnell MS
<b>Room 112</b> <i>Use Phenomena to Make Gains in Student Inquiry (Grades K-12)</i>	E,MS,HS: 3D	Participants will work in collaborative groups to identify anchoring, investigative, and everyday phenomena. This strategy will intrinsically motivate your students and improve their inquiry skills.	Jill Krysinski STEMscopes / Accelerate Learning
<b>Room 113</b> <i>Planning Science Instruction with the Universal Constructs in Mind</i>	E,MS,HS: imp, STEM	If we want students to exhibit Universal Constructs like Critical Thinking, Creativity, Collaboration, etc. it is important we plan instruction to intentionally include them.	Tammy Askeland-Nagle, Mississippi Bend AEA
<b>Room 114</b> <i>Cross-curricular Inquiry Cubes as Phenomena to Ignite Curiosity</i>	E,MS,HS: inc,3D,STEM	This workshop demonstrates the use of inquiry cubes for starting a unit. Participants will receive the instructional materials to use this lab in their classrooms.	Yen Verhoeven Qi Learning Research Group
<b>Room 115</b> <i>Year-Long Shadow Investigation</i>	E: place	Moving students to an understanding of shadow length and direction through year-long investigations, outside observations, and data tracking.	Emily Henry, Indianola CSD, Jerrid Kruse, Drake University
<b>Room 116</b> <i>Environmental Internship</i>	HS: place	Environmental internship for grades 10-11-12. Students would be working at water/wastewater facilities with an opportunity to attain a Grade 1 license upon HS graduation.	Bob Watson, Watson Brothers
<b>Room 208</b> <i>Students in the Lead: Real-World Data and Game Design</i>	E, MS: STEM	Learn how to use your students' interest in gaming to investigate science topics with data and then design their own games.	Peg Steffen, Retired NOAA, Barb Gigar, Iowa Department of Natural Resources
<b>Room 209/</b> <i>Iowa STEM Teacher Externships</i>	MS, HS: place	Visit this session to learn more about using your STEM skills to work in the "real world" this summer.	Jason Lang, Iowa Governor's STEM Advisory Council
<b>Room 212</b> <i>Bioengineering - Crops of the future</i>	MS, HS: 3D, imp,STEM	Through this engaging session explore the various types of bioengineering scientists use and how our modern agricultural crops have improved. Learn techniques for teaching GMOs.	Will Fett, Iowa Agriculture Literacy Foundation
<b>Room 213</b> <i>OpenSciEd: Open Education Resource for Middle School Science</i>	MS: 3D	OpenSciEd has free curriculum materials that support the implementation of the Iowa Science Standards. Learn more about the instructional routines of this standards-aligned, innovative resource.	Tami Plein, Retired from AEA



**EXPO 2**  
10:15-10:45



<i>Light &amp; Photosynthesis</i>	Investigate light's role in photosynthesis by creating desktop greenhouses using clear plastic cups, electrical tape, peat pellets, small LED lights, and coin cell batteries.	MS: imp	Cindy Hall, Iowa Agriculture Literacy Foundation, Chrissy Rhodes, Iowa Agriculture Literacy Foundation
<i>Matter Matters!</i>	Come explore hands-on ways for students to investigate matter! From initial investigations to revisiting concepts, matter matters. Literacy connections included!	E: STEM	Brenda Kaufmann, North Tama County
<i>Anchoring Phenomena in NGSS Storylines</i>	Experience the anchoring phenomena and learn more about NextGenStorylines' second-grade Corn unit, high school Evolution unit, and high school Chemical Energy unit.	E,MS,HS: 3D	Dan Voss, Dallas Center-Grimes HS
<i>Ramps and Path Ways: Physics in the Elementary Classroom</i>	Participants will interact with ramps, blocks and other materials to explore the physics of motion.	E: imp,STEM	Vonna Watson, North Tama County
<i>Using Location-Based Mobile Games to Enhance Field-Trip Engagement and Effectiveness</i>	ARIS allows non-programmers to create free location-based games. See how you and your students can harness this powerful tool to enhance learning outside the classroom.	E,MS, HS	Dana Atwood-Blaine, University of Northern Iowa
<i>Comparison of Active and Passive Learning on Long-Term Academic Retention in Elementary Schools</i>	Personal research conducted by an elementary education pre-service teacher spanning a two-year period, compares active and passive learning and their effects on long-term retention.	E: imp	Jennifer Wiley, Wartburg College
<i>Iowa Junior Academy of Science</i>	Middle and high school students learn the research process and present at science fairs and the IAS Annual Meeting. Scientist feedback and funding available.	MS,HS: inc, place, imp	Craig Johnson Iowa Academy of Science
<i>Hands-on biology-based activities for K-5 students</i>	Hands-on activities offered by Mobile Lab are simplified experiments from two lab courses at Biology of the University of Iowa, Human Biology and Animal Behavior.	E:	Olga Miakotina University of Iowa
<i>Experiencing Language Inclusion in the STEM Classroom</i>	Preservice teachers gained empathy and new teaching practices for use in language diverse classrooms after spending two weeks in a Spanish immersion STEM camp.	E: inc	Emily Henry Indianola CSD

**Remember to allow time to visit the Exhibition Hall!**

# SESSION 3 10:45 - 11:30

<b>Room 108</b> <i>Hands-On, Minds-On STEAM Lessons!</i>	E: STEM	While hands are engaged, minds should be questioning, sorting through sensory input, and making connections. Join us for a hands-on, minds-on session working through NGSS-aligned lessons with SAM Labs STEAM kits! Discover how an app, wireless Bluetooth blocks and step by step lessons bring STEAM to life! You will leave the workshop with a step-by-step lesson you can use with your class. Geared towards K-5 students.	Jackie Danley, SAM Labs, Inc.
<b>Room 109</b> <i>Authentic Texts: What Are They and How do I Use Them in the Middle Grades?</i>	MS: STEM	Incorporating literacy in science doesn't need to be daunting!	Josh Ellis, Nicole James, Carly Sis, Stacy DeCoster, Grinnell MS
<b>Room 112</b> <i>Using Argumentation to Discuss Phenomena (Grades 3-12)</i>	E,MS,HS : imp	Argumentation is a proven strategy that reduces teacher talk and increases purposeful student talk. ELA skills and the 21st Century Skills are enhanced with argumentation.	Jill Krynski STEMscopes / Accelerate Learning
<b>Room 113</b> <i>Open Education Resources to Support the Iowa Science Standards</i>	E,MS,HS : inc,3D,imp	Come learn about some of the best resources available to science teachers-and they're all free!	Tammy Askeland-Nagle, Mississippi Bend AEA
<b>Room 114</b> <i>Mythbusting Labs that Demonstrate the Nature of Science</i>	E,MS,HS : inc,3D,i	This workshop demonstrates how to teach the nature of science using short, hands-on class labs and demos. Attendees will receive re-	Yen Verhoeven Qi Learning Research Group
<b>Room 115</b> <i>Shining a Light on Elementary Inquiry Experiences</i>	E: 3D	Come see how you can engage elementary children with activities about light and how these experiences can transfer to teaching children through inquiry.	Jesse Wilcox, Sarah Nolting, Naryah Moore, MacKenzie Grenko, Simpson College
<b>Room 116</b> <i>Literacy in the 6-12 Science Classroom</i>	MS, HS: imp	Literacy in schools is a building goal objective, not just the focus of the ELA teachers.	Alicia Schiller Haynes, JameySue Smith, Central Lee HS
<b>Room 208</b> <i>Forget Lab Reports! Switch to Writing Scientific Claims.</i>	E,MS,HS : imp	Simultaneously challenge and excite your students (at all grades) by teaching them to write a scientific claim, supported by the justification of collected evidence.	Mike Wedge, Kate Wedge, Sibley-Ocheyedan High School
<b>Room 209</b> <i>Engineering Design: Start an Engaging, Relevant, Hands-on, STEM Activity Today!</i>	E,MS,HS : 3D,imp,STEM	Let's collaborate and create an original engaging activity together! Let us help you start the process - or bring your successes and join the discussion.	Ken Turner, University of Dubuque, Anne Turner, North Tama School District
<b>Room 212</b> <i>The Science Fair: Passionately Supporting Curricula Standards and Having Fun</i>	MS, HS: place	Student-driven research projects presented at Fairs provide authentic science experiences that meet standards in many disciplines, especially science. Learn about the challenges and resources available.	Scott Wendt, Iowa State Environmental Health and Safety DeAnna Tibben, Ames HS, Janet Dixon, Rtd
<b>Room 213</b> <i>Modeling Ecosystems in a pop bottle</i>	MS: 3D	Learn how to incorporate the modeling process and engineering and design practices to create self-contained ecosystems in a bottle.	Kyla Burns, Sara Kate Howe, Johnston HS

# SESSION 4 11:30 - 12:00

<b>Room 108</b> <i>What? I Have a Blind Student in my Classroom!</i>	E,MS,HS: inc	Hear strategies for full inclusion of students who are blind or low vision in science and STEM classrooms.	Jennifer Bliss, STEM Consultant, Iowa Educational Service for the Blind and Visually Impaired
<b>Room 109</b> <i>How to get into the National STEM Scholar Program</i>	MS, HS: imp,STEM	How I got selected, what it is, why its awesome!	Paula Carlson, Tripoli CSD
<b>Room 112</b> <i>Merging Science and Art Through Inks</i>	MS: inc,place	Merge art and science by learning the basics of creating your own inks from comic artist, Dylan Jacobson.	Dylan Jacobson, Dylan Jacobson's Champions
<b>Room 113</b> <i>The Science of Iowa Agriculture</i>	E, MS: place	Agriculture is all around us. Discover ways to connect crops and livestock to science learning. Explore phenomena related to production, renewable energy, conservation, and more.	Cindy Hall, Iowa Agriculture Literacy Foundation
<b>Room 114</b> <i>Improving Students' Science and Engineering Practices by focusing on Executive Function Skill Development</i>	E,MS,HS: STEM	A focus of science education the last few decades has been promoting student argumentation for learning. Come see how to facilitate argumentation in your classroom.	Mason Kuhn, Ron Rinehardt University of Northern Iowa
<b>Room 115</b> <i>Disciplinary Literacy in Science</i>	E: STEM	Through concrete activities we move students from simply using reading in school to experiencing how reading is used by science professionals.	Emily Henry, Indianola CSD, Jerrid Kruse, Drake University
<b>Room 116</b> <i>Teachers Create and Share Local Phenomena with IPTV Pilot Project</i>	E,MS,HS: place,imp	Learn about the IPTV Iowa Science Phenomena pilot project and how you can apply to join a teacher cohort to identify and capture local phenomena!	Tiffany Morgan, Iowa Public Television Bryan Bauer, Iowa Public Television
<b>Room 208</b> <i>Igniting Passion in Students through Multifaceted Collaboration between Institutions</i>	E, MS: imp	A novel, multifaceted collaboration between a community college and intermediate school has resulted in enthusiasm and engagement in the science classroom at both institutions.	Nikae Perkinson, North Iowa Area Community College, Lisa Hugi, Mason City CSD
<b>Room 209</b> <i>Forming STEM Community Partnerships</i>	E,MS,HS: place, imp,STEM	Learn how to connect with businesses, activities businesses can participate in, and learn the benefits of these experiences. Experts will share their stories.	Mary Trent, Iowa Lakes Community College
<b>Room 212</b> <i>Connecting the NGSS to the World Food Prize and Beyond</i>	HS: 3D	Engage students in discovering relevant topics of climate change, agriculture, overpopulation and food insecurity by challenging them to brainstorm solutions and share through poster presentations.	Tricia Reichert, Emmetsburg HS
<b>Room 213</b> <i>Getting Students Outdoors to Solve Real Problems</i>	MS: place	Learn how to design a unit that gets students outside collecting data to solve a local environmental problem. Appropriate for MS to AP level.	Kyla Burns, Johnston HS



# Iowa Academy of Science

Promoting science research, science education, the public understanding of science, and recognizing excellence in these endeavors.



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# Luncheon & Awards 12:00–1:15

## KEYNOTE:

### PROMOTING PASSIONATE SCIENTIFIC LITERACY THROUGH PLACE-BASED SOCIOSCIENTIFIC ISSUES ENGAGEMENT

DR. BENJAMIN HERMAN  
ASSOCIATE PROFESSOR  
LEARNING, TEACHING & CURRICULUM  
UNIVERSITY OF MISSOURI



**Benjamin C. Herman** holds a Ph.D. in Science Education with a minor in Statistics from Iowa State University. Ben has an extensive background in science and science teaching with a B.S. in Animal Ecology, an M.S. in Wildlife Resources, an M.A.T. in Science Education and experience as a certified science teacher in Iowa and Florida. His research addresses how sociocultural factors and epistemological beliefs about science and technology impact socioscientific decision-making, particularly regarding environmental issues, and how science education can better prepare people to critically engage in those issues. Ben's scholarship has been recognized through several awards, including the prestigious NARST Early Career Research Award. He also serves as an Associate Editor for the Journal of Research in Science Teaching (JRST).

## ISTS AWARDS

The mission of the Iowa Academy of Science is to further scientific research, science education, public understanding of science and recognize excellence in these endeavors. One of the ways to recognize this excellence is by awards. We encourage you to nominate a deserving individual or corporation for an appropriate award.

**The Friend of Science (FOS) Award - Individual** - ISTS recognizes with a plaque an individual or group, within the state, who has made significant contributions to ISTS and/or to science education at the local, regional or statewide level.

**The Friend of Science (FOS) Award - Corporate** - ISTS recognizes with a plaque a corporation, company, coalition, foundation or government entity who has made significant contributions to ISTS and/or to science education at the local, regional or statewide level.

**The Outstanding Service Award (OSA)** - ISTS recognizes with a plaque an ISTS member who has made sustained, extraordinary contributions to ISTS and/or to science education at the state and/or national level.

**Excellence in Science Teaching Awards (ESTA)** - The Iowa Academy of Science (IAS) awards to outstanding teachers of all grade levels and areas of science, teachers who are recognized for their work and innovations in science education. The core of the Award is \$100 for the teacher and a Plaque. Nominations are accepted in the following categories:

- Physical Science (physics, chemistry and physical science)
- Life Science (biology, anatomy/physiology, life science)
- Earth/Space Science/Environmental Science
- General/Multiple Science (integrated science, interdisciplinary courses, multiple preps)
- Middle School/Junior High Science
- Elementary Science (two awards may be given/year)
- S.T.E.M. Science (one each, at Elementary, Middle School, and High School)
- Science Supervisory - (District, private, AEA, museum, naturalist, etc.)



# 2019 PRESIDENTIAL AWARD FOR EXCELLENCE IN MATH AND SCIENCE TEACHING

## IOWA FINALISTS IN SCIENCE

**CAROL REIERSON**

36-year teaching veteran  
North Fayette Valley  
Community School District  
Elgin, Iowa



**BRADLEY JACOBSON**

15-year teaching veteran  
Des Moines Public  
Schools  
Des Moines, Iowa



(PAEMST) are the Nation's highest honors for teachers of mathematics and science. The awards recognize highly qualified K-12 teachers for their contributions in the classroom and to their profession. The core of the award is a \$10,000 National Science Foundation grant to the recipient's school, to be spent at the



## EXCELLENCE IN SCIENCE TEACHING AWARD



**2019 ESTA Recipients**

From left: Connie Courbat (Elementary), Anne Turner (Elementary), Amanda Sanderman (Science Supervisory), Jayme Smith (Physical Science), Alicia Schiller Haynes (HS STEM), Julie Crozier (Mid/Junior High), Cheryl Kluesner (General Science), Michael Skopec (Life Science)

# 2019 OUTSTANDING SERVICE AWARDS



**Craig Johnson**, a Fort Dodge native, is a lifelong weather enthusiast, becoming interested in clouds, storms, and everything weather related before the age of 10.

During his career as a meteorologist, being able to represent science, especially to Iowa's youth, has been fun. Upon his retirement after 30 years in television and radio in Salt Lake City, Cedar Rapids, and Waterloo. Craig joined the Iowa Academy of Science in 2004 as a member, and became its Executive Director. He says that never in a million years would he have guessed that life would have sent him in the direction of the Academy.

The Academy sponsors education opportunities for Iowa teachers through ProjectWET and the NASA GLOBE programs. It administers the Iowa Science Foundation, hosts the ISTS Fall Conference, the IAS Annual Meeting and through it all promotes science research, science education, and the public understanding of science. In Craig's opinion one of the best things IAS does is to sponsor the Iowa Junior Academy of Science - encouraging youth to try real science. *The Journal of the Iowa Academy of Science*, a peer reviewed journal, receives thousands of hits from all over the world.

Mr. Johnson's role as IAS Executive Director comes down to helping facilitate all the Academy's activities as determined by the membership. Everything he does, is in a supporting role to what the Academy membership wants.

Craig says, "It surely is a surprise what a 10-year old's interest in weather has led to. It opened unexpected doors along the way, and this Fall Conference today is another of those doors.

In the same way, your commitment to teaching has led you here, to be part of this meeting, this is one piece of the puzzle you are completing as you help spark curiosity among your students."

For all he does for us, the ISTS thinks Craig Johnson is an excellent choice for the OSA.

**Dr. Jerrid Kruse** has given 35 presentations at the annual Iowa Science Teachers Section Fall Conference, and annually brings many of his students to participate in and present at the Conference. He served as editor of the *Iowa Science Teachers' Journal* for five years, and a past member of the State of Iowa Science Leadership Team. In Iowa, he has been a chemistry laboratory instructor at Iowa State University, a middle and high school science teacher in LeMars, and is currently an associate professor of science education at Drake University. While at Drake he co-created the state's first STEM endorsement, increased secondary science education coursework from 2 to 9 credits, created science content courses targeting content necessary for elementary teachers, and enacted a novel field experience in which he co-teaches with and observes 40 elementary and secondary preservice teachers as they work with K-12 students 10 times each semester. He has published 35 articles or book chapters, given over 150 presentations, serves on the editorial board of *Innovations in Science Teacher Education* and the *Journal for Science Teacher Education*, reviewed for *Science & Education* and the *Journal for Research in Science Teaching*, served on the board of the International History, Philosophy, and Science Teaching Group, and generated more than \$600,000 in funding to directly benefit in-service and preservice teachers for professional development experiences. Kruse was named the 2019 *Outstanding Science Teacher Educator of the Year* by the Association for Science Teacher Education and awarded Drake University's 2019 *Madelyn M. Levitt Teacher of the Year*. Undoubtedly Jerrid Kruse is deserving of the ISTS Outstanding Service Award.



# 2019 FRIEND OF SCIENCE AWARDS

**Barry Plassman** has spent countless hours after work and on weekends volunteering his time and expertise to support the efforts of the Holmes Junior High Science Club. An engineer at John Deere Manufacturing in Waterloo, Mr. Plassman has shared his knowledge of engineering to help students from Holmes build machines to compete in the Iowa Science Olympiad. His enthusiasm has been matched by his patience in helping our Junior High students realize their potential as problem solvers and critical thinkers. His calm demeanor and "can do" attitude have made him a very valuable member of our "team".



It is not easy to earn the respect of young adolescents, but Mr. Plassman is very popular with our students. They always ask if he will be at our club meetings and they have enjoyed that he has come with us as a parent chaperone on our trips to the Science Olympiad. All of the teacher-coaches on our Science Club team have backgrounds in Biology and Chemistry. Without the expertise of Barry Plassman, we would be hard pressed to be competitive in the building/engineering events of the Olympiad.

This last year Holmes fielded two teams at the Science Olympiad (teams are limited to 15 members) which took 2nd and 5th place in the State. One event was the special province of Mr. Plassman, Hovercraft. Teams of students needed to build a hovercraft capable of sustained movement that followed, to the letter, the design specs in the rules. The work in building the device was demanding and intricate. Mr. Plassman provided just the right amount of guidance to the students. He understood his role as a resource and sounding board for their concerns. Holmes Jr. High took 1st and 4th place in the Hovercraft event at this year's Olympiad, and last year, 2nd place. Words cannot express the gratitude the students and coaches of the Holmes Junior High Science Club have for Barry Plassman. Assuredly, Mr. Plassman is an obvious choice for the FOS.

## The Des Moines Area Community College

**(DMACC)** advances STEM related initiatives both inside and outside the classroom. The college offers over 100 STEM programs and certificates for students to study preparing them for rewarding careers. Recently, the College hired an Academic Dean for a new department that focuses on Science, Engineering, Math and Social Sciences (SEMSS). Scott Schultz's new division is currently experiencing enrollment growth as STEM professionals are in high demand. He will focus on offering small classes with innovative instruction and developing more science labs equipped with the technology students need to be prepared for today's careers.



Another reason behind DMACC's nomination is the College's outstanding community outreach in this area, including the annual ciLive event at the West Des Moines Campus that attracts nationally recognized speakers; the DMACC STEM Festival, held each October that draws hundreds of middle school students who participate in hands-on experiments and the Iowa Children's Water Festival that each May draws 2,000 5<sup>th</sup> graders from throughout Iowa.

Clearly, DMACC is a Friend of Science Education.

# 2019 FRIEND OF SCIENCE AWARDS



**The Neal Smith National Wildlife Refuge (NWR)** environmental education program is a standards-based curriculum that uses a student-centered approach. Neal Smith NWR adopted the inquiry-based environmental education framework titled *The Compass to Nature* from the Prairie Wetlands Learning Center managed by the U.S. Fish and Wildlife Service. This teaching approach has been so successful that National Wildlife Refuges across the nation have incorporated it into their environmental education programming. Like a compass, *The Compass to Nature* uses four points to lead students and educators back to nature. The framework includes lessons that focus on phenology, journaling, naturalists, and placed-based education. The “Sense of Wonder” is the awe-inspiring experiences students encounter while investigating nature and it is the glue that holds the four components of the *Compass to Nature* framework together.

The goal of Neal Smith NWR education program is to provide students with fun and engaging outdoor lessons that allow students to develop their own questions and make personal connections to their local natural environment. Additionally, this teaching approach strives to make students feel safe and comfortable outdoors while providing them with inspiring experiences that can ignite an interest in and passion for the natural world.

Lisa Chizek is the teacher who nominated Neal Smith NWR for the Friends of Science Award. Lisa participated in the refuge’s two-day teacher workshop titled “Teaching in the Outdoor Classroom” in order to become a partner teacher at refuge. Inspired by what she learned at the workshop, Lisa visited the refuge with her fifth grade students in May 2019. Lisa provided the following summary to explain why she nominated Neal Smith NWR for the award.

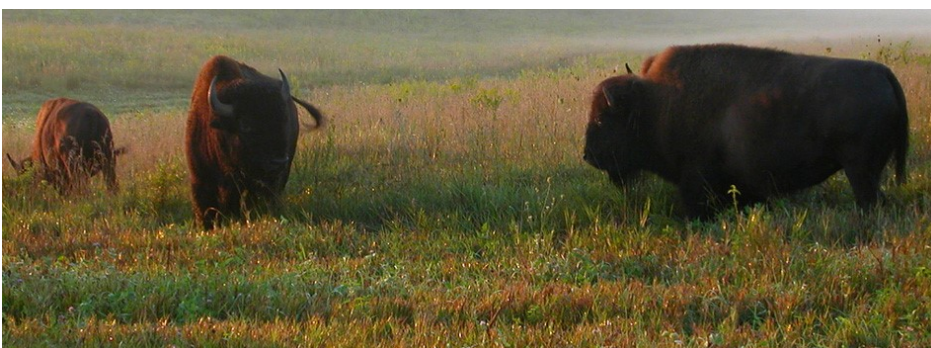


“I nominated Neal Smith National Wildlife Refuge because of all the opportunities they offer “kids” of all ages. Neal Smith National Wildlife Refuge encourages all “kids” to get outside and to learn about and appreciate their natural world. They seek to “teach learners how to become aware, ask questions, seek evidence and formulate their own, unique, creative thoughts about the environment and conservation.”

“I first learned about them when I took an outdoor learning environment class at the refuge. I do not think enough children spend time enjoying the outdoor, and I wanted to learn ways to help connect my students with nature. During the class, we took time to just sit and listen, smell, see and appreciate the wonderful outdoors. I reconnected with nature. My experiences at Neal Smith strengthened my drive to get my students outdoors to appreciate and learn about their natural world.”

“Since I took the class, my students and I have spent time outdoors listening, smelling, seeing and appreciating nature including helping to put in a butterfly garden in our schoolyard.”

“Last spring, our fifth-grade students participated in a field trip at Neal Smith National Wildlife Refuge learning about the tall grass prairie, having a picnic outdoors, and going on a nature walk. The field trip was a wonderful experience for my students.”



With the educational program that Neal Smith NWR has developed, they are a clear choice as an FOS recipient.

# SESSION 5 1:15 - 2:00

<b>Room 108</b> <i>The Science Center Sampler</i>	E,MS: inc, place, STEM	Learn what opportunities are available within the Science Center of Iowa's new Innovation Lab. Activities demonstrated will highlight workshops available with a focus on creating technological, inclusive environments.	Patrick Rice, Science Center of Iowa
<b>Room 109</b> <i>Environmental Heroes: Water Connections Us All</i>	E,MS, HS: inc,place	Help save the day! Through a game model become an environmental hero, discover issues in your area, and gain the tools to help solve them.	Cathryn Carney, University of Iowa, Barb Ehlers, Upper Iowa University Jeff Monteith, New Hampton CSD, Kata McCarville, Upper Iowa University
<b>Room 112</b> <i>Use the 5-Es to Provide Equity to Science Instruction</i>	E,MS, HS: inc	Implementing the 5 Es in STEM classrooms will allow equal access and opportunities to better understanding STEM subjects for all students, including traditionally underrepresented students.	Jill Krysinski STEMscopes / Accelerate Learning
<b>Room 113</b> <i>Gaining a Student Perspective of NGSS</i>	MS: imp	Come find out how a teacher elicits student perceptions on NGSS implementation in a classroom.	Christopher Like, Bettendorf HS, Amanda Bohnert, Bettendorf HS
<b>Room 114</b> <i>Encourage Passion by Differentiation and Personalization for ALL Students</i>	E,MS, HS: inc, imp,STEM	Find interesting resources to increase differentiating and personalizing the needs of your students with AEA Learning Online's Student Personalized Learning System and Open Educational Resources.	Denise Krefting, AEA Learning Melissa Wicklund, AEA Learning
<b>Room 115</b> <i>Pop Cans and Particle Motion</i>	HS: STEM	A modified activity that includes explicit and reflective NOS instruction and directly addresses NGSS HS-PS3-2 to help students deeply understand the particulate nature of matter.	Evan Jorgenson ADM HS, Jerrid Kruse Drake University
<b>Room 116</b> <i>IPTV's Iowa Land and Sky: Geology, Biodiversity and Environmental Issues</i>	MS: place,3D	Need Iowa-based phenomena? You need IPTV's new resource, Iowa Land and Sky! Interactive 360° videos, Iowa drone footage & Iowa teacher created/vetted classroom materials and 3-D NGSS alignment!	Tiffany Morgan, Iowa Public Television
<b>Room 208</b> <i>Encouraging Student-Led STEM Investigations in Early Elementary</i>	E: inc	Learn how STEM investigations can occur during small group reading.	Beth VanMeeteren, University of Northern Iowa
<b>Room 209</b> <i>Playing Games, Posing Questions and Discovering Answers Through Data Analysis</i>	HS: STEM	HS science students posed meaningful questions after playing a crop optimization game and answered them through an assisted data analysis of the class's data set.	Julie George, former West Central SD, Nigel George, Upper Iowa University
<b>Room 212</b> <i>UNI Physics Teaching Endorsement Program</i>	HS: imp	UNI Physics is offering a program for teachers to complete course requirements for the Iowa physics teaching endorsement. Join us to learn about the program.	Lawrence Escalada, University of Northern Iowa Jeffrey Morgan, University of Northern Iowa
<b>Room 213</b> <i>Integrating Engineering in a Middle-Level Sound Unit</i>	MS: STEM	Meaningfully integrating engineering in science units can be difficult. This session will incorporate the nature of engineering and design into a middle-level unit on sound.	Jaclyn Easter, Grand View University, Maddie Green, Grand View University, Colin Seebach, Bergman Academy

# SESSION 6 2:30 - 3:15

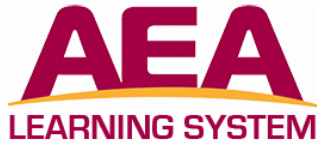
<b>Room 108</b> <i>The Earth Has a History</i>	MS,HS: inc	Eustatic and Tectonic changes, climate changes, landscape changes, life forms changes and the GeoSciences. Explore how to use the Geosciences to investigate changes in the Earth's History.	Sherm Lundy BMC Aggregates
<b>Room 109</b> <i>Educational Aquaponics</i>	E,MS,HS: inc,STEM	The designing and implementation of an aquaponics system for investigation and instruction in the NGSS aligned classroom.	Sadie Short, Becca Montgomery, Sidney Baumgartner, Michael Bechtel, all: Wartburg College
<b>Room 112</b> <i>Making Storylines Work: Mindset and Tips for 3D Teaching</i>	E,MS,HS: 3D,imp	A teacher's perspective and resources for developing/teaching 3d storylines.	Dan Voss, Dallas Center-Grimes HS
<b>Room 113</b> <i>The Physics of a Cell Phone- A Complete NGSS Unit</i>	HS: 3D	Come find out how teachers have incorporated NGSS shifts into unit design and leave with a complete physics unit.	Christopher Like, Bettendorf HS, Michael Grannen, Bettendorf HS
<b>Room 114</b> <i>Adding Blending or Flipping Options to Your Classroom</i>	E,MS,HS: inc,place,imp	This session will focus on an overview of models for blended learning and how Iowa teachers are implementing this. You will get started with blending/flipping.	Denise Krefting, AEA Learning Melissa Wicklund, AEA Learning
<b>Room 115</b> <i>Elementary Science Teachers Discussion Session</i>	E: 3D	Discussion session for all elementary science teachers and others invested in the success of elementary science. Discuss challenges, ideas and resources to help each other.	Lisa Chizek, University of Northern Iowa
<b>Room 116</b> <i>Creating a "Big District" Science Program in a "Small" District</i>	E,MS,HS: inc	Doug Gee, superintendent in Clear Lake, IA since 2016, leads work on 4 strategic priorities to engage students, staff, and the community in "science learning."	Doug Gee, Clear Lake CSD
<b>Room 208</b> <i>Shifting Grading Practices Using SEPs</i>	MS, HS: inc, 3D,STEM	This session will focus on our district's shift to skill-based assessments and grading practices utilizing the SEPs to improve feedback to students and increase transferability.	Alaina Appley, Mt Vernon HS, Heather Allen, Mt Vernon HS, Rob Hanson, Mt Vernon MS
<b>Room 209</b> <i>Rebuild Nepal Education Project with fellow U of Iowa Volunteers</i>	E,MS,HS: inc,place,imp,STEM	Rebuild Nepal Education Foundation volunteers in Nepal since the earthquake of 2015. Find out what Iowa Educators accomplished in 2019.	Ernest Schiller, Holy Trinity Schools, Ted Neal, University of Iowa
<b>Room 212</b> <i>STEM Innovator: Transforming Classrooms into Centers of Innovation</i>	MS: inc,STEM	Tackle a STEM Challenge to transforming your classroom into a hub of innovation. Learn STEM industry strategies to create a rapid prototype.	Leslie Flynn, Natalie Averkamp, Maria Hasken-Averkamp, Rachael Crady, Grace Trane, all: University of Iowa,
<b>Room 213</b> <i>Ladybugs and Genetic Variation</i>	E, MS: 3D	This elementary and MS-focused session uses preserved ladybugs as an introduction to the concept of genetic variation. 3D aspects of the NGSS modeled and discussed.	Jaclyn Easter, Grand View University, Sara Mulder, Grand View University, Katelynne Belcher, Grand View University, Hallie Edgerly, ADM MS

# SESSION 7 3:15 - 4:00

<b>Room 108</b> <i>Chemical Reactions: Designing Better Chemical Batteries</i>	MS: 3D, STEM	Students investigate how chemical energy can be transformed via a chemical process into electrical energy. After building a prototype wet cell, students brainstorm improvements and build, test, and evaluate new prototypes to meet a set of predetermined criteria within specified constraints.	Darin Christianson Lab-aids
<b>Room 109</b> <i>Biophilia in the Classroom</i>	E,MS,HS: inc,imp	Several years of personal Biophilia research will be explained through historical foundation, education legislation, experimental protocols, student benefits, and future endeavors.	Mike Bechtel, Wartburg College
<b>Room 112</b> <i>Planning for Immersive Argument-based Science Learning Environments</i>	E,MS,HS: 3D	Updated planning tools, templates, and resources will be described to help teachers plan argument-rich, STEM-infused science learning environments aligned with the Iowa Science Standards.	Mark McDermott, University of Iowa, Will Hansen, University of Iowa
<b>Room 113</b> <i>Chemical Bonding and "Rainworks" Sidewalk Art</i>	HS: 3D	Explore a phenomenon-driven unit for regular Chemistry that uses Rainworks sidewalk art to engage students in learning about chemical bonding and forces.	Holly Garcia, Riverside HS
<b>Room 114</b> <i>The World Famous Iowan that Most Iowans Know Nothing About</i>	E,MS,HS: place	Field trip to the Norman Borlaug Heritage Farms!	Wendy Lamos, West Fork CSD, Jennifer Otten, University of Nebraska
<b>Room 115</b> <i>Science/Math Integration for a Sustainable Planet</i>	E: STEM	Discover hands-on activities on real-world human ecology concepts (population growth, natural resource use and biodiversity) while building foundational math skills.	Connie Schaffer, University of Nebraska
<b>Room 116</b> <i>Science Olympiad and Your School</i>	MS: inc,place	This presentation will explain what the Science Olympiad program is about in Iowa and how to incorporate it into your school community.	Jill Maroo, University of Northern Iowa
<b>Room 208</b> <i>Measuring NGSS Implementation</i>	E,MS,HS: 3D,imp	What does it really mean to say that you are "implementing NGSS" in your classroom? This session will provide a measurement tool for self-assessment.	Mandie Sanderman, Central Rivers AEA
<b>Room 209</b> <i>Evolution for Educators</i>	MS: imp	The TIES helps middle school teachers teach evolution with confidence.	Kathy Van Hoeck, Teacher Institute for Evolutionary Science
<b>Room 212</b> <i>Engaging Urban and Suburban Students in Nature Using Place-based Learning</i>	E,MS,HS: place	Experiences in nature are necessary for healthy child development and for establishing environmental stewardship. Come see how we engage students meaningfully in the outdoors.	Kean Roberts, Waukee CSD, Jesse Wilcox, Simpson College, Anna Bahnsen, United Tribes Technical College

# CLOSING 4:00 - 4:20 IN EXHIBIT HALL

# 2019 EXHIBITION HALL



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**Iowa Agriculture Literacy Foundation**

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Kristie Wildung  
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**Iowa Children's Water Festival**

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**Iowa Governor's STEM Advisory Council**

Kari Jastorff

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# 2019 EXHIBITION HALL



## Iowa Limestone Producers Association

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# 2019 EXHIBITION HALL



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**Pearson**

**Tim Keigan**

**Pearson K12 Learning**

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**SAM Labs Inc**

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**Patrick Rice**  
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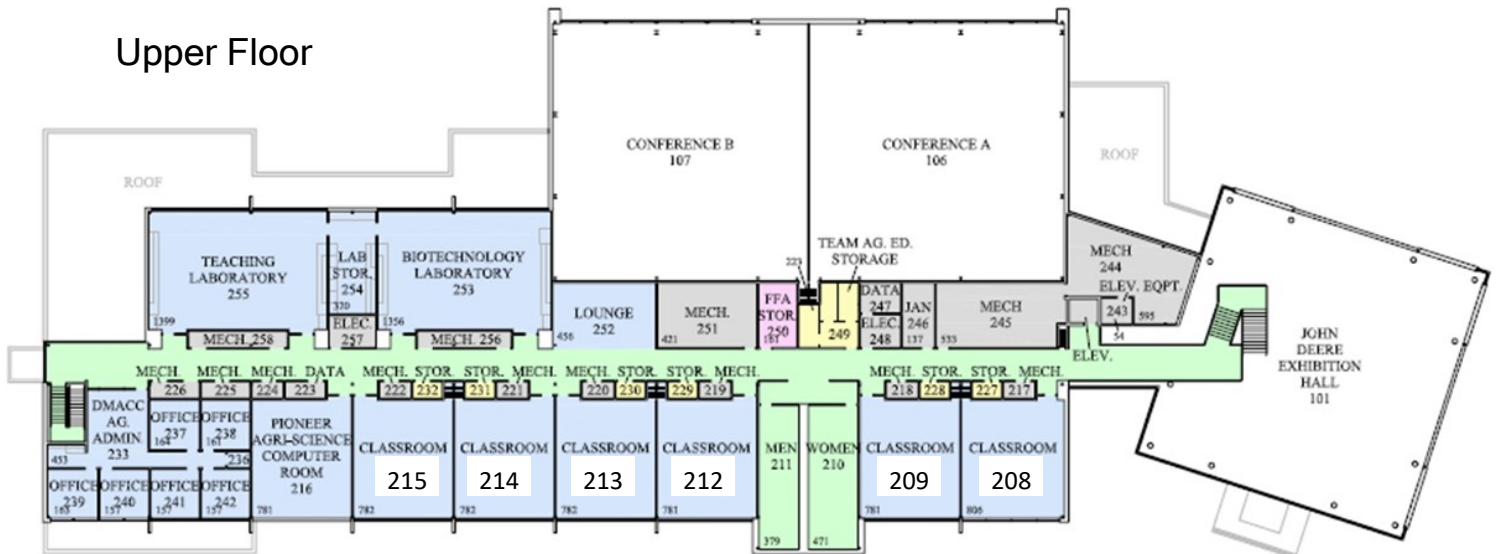
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