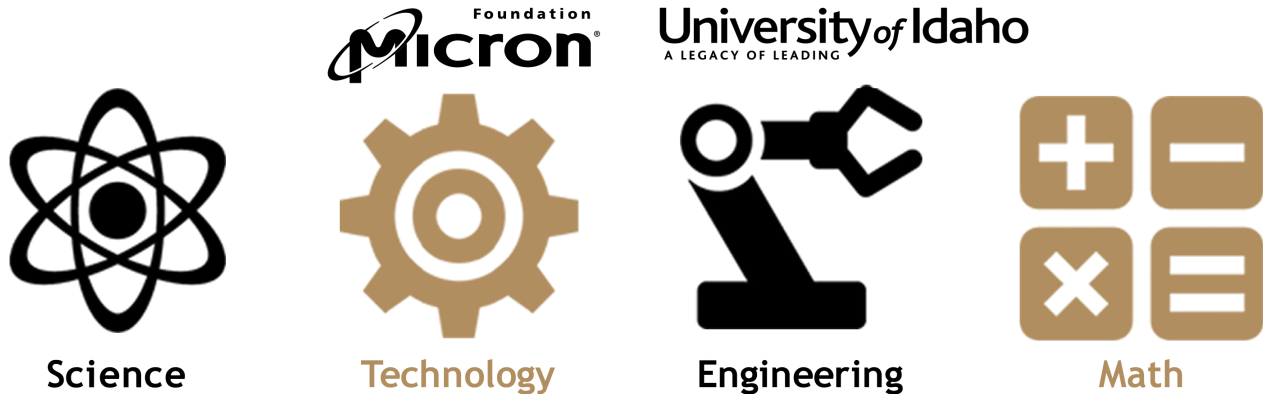


Idaho Educational Programs and Partnerships



PRE-REGISTRATION REQUIRED

UI-Micron 2015 Idaho STEM Innovations Conference

*Highlighting Successful Educational
Programs and Partnerships*

June 9, 2015

Riverside Hotel Boise

&

Discovery Center of Idaho

Welcome



“Welcome to the 2015 Micron Foundation/University of Idaho STEM Innovations Conference. This year we are excited to present the culmination of five years of research investigating the barriers to and perceptions of STEM education in Idaho. In addition to hearing about this exciting research, this year’s program highlights many of the successful STEM education programs and partnerships in Idaho that are making a difference in our communities. We hope you will find the program to be not only interesting, but informative as we work together to address the STEM education goals of the state at the SBOE STEM Summit tomorrow. Idaho is truly moving the needle in STEM Education thanks to everyone committed to this important issue.”

Melinda Hamilton
UI Director of STEM Education



“The Micron Foundation is committed to helping our youth see how STEM plays a role in their everyday lives and can be part of their future. As a co-sponsor of the University of Idaho’s research initiative, we are excited to share the results, which we believe can improve student experiences in STEM education and ultimately increase their success.”

Dee Mooney
Micron Foundation Executive Director

Schedule

CONFERENCE BEGINS AT THE RIVERSIDE HOTEL: PRE-REGISTRATION REQUIRED

7:00 Table Displays Set Up

7:30 Check In / Optional Credit Registration / Continental Breakfast / Display Tables

8:30 Welcome / Conference Overview: Melinda Hamilton and Dee Mooney

9:00 Speaker Lorna Finman: STEM Action Center

9:30 Session I 45-Minute Presentations

10:15 Break

10:30 Session II 60-Minute Presentations

11:30 Session III 30-Minute Presentations

Noon Lunch with speakers Leontina Hormel and Susan Stauffer: Idaho Student and Teacher Surveys' Findings. Followed by time to visit table displays.

2:00 Session IV 60-Minute Presentations

3:00 Session V 30-Minute Presentations

3:30 Break

3:45 Session VI 30-Minute Presentations

4:15 Session VII 30-Minute Presentations

4:45 Networking Opportunity. *Attendees earning university credit meet briefly with course instructor Susan Stauffer in the ballroom near the stage.*

CONFERENCE MOVES TO THE DISCOVERY CENTER OF IDAHO: 131 W. Myrtle Street

5:30 STEM Bus open in the Discovery Center of Idaho parking lot

6:00 Discovery Center of Idaho opens – exhibits and hors d'oeuvres available

6:45 Speaker Ed Penhoet: President Obama's Council of Advisors on Science and Technology

8:00 Conference concludes

Keynote Speakers

Lorna Finman



Lorna Finman is the chief executive officer for LCF Enterprises, a high-tech engineering and manufacturing firm in Post Falls.

She received bachelor's degrees in physics and math before graduating from Stanford University with a master's and a doctorate in physics.

Finman has one patent to her credit; an award from the military for saving our troops through the development of jamming devices that disable IED's; and an award from the Air Force for Research and Development for our nation's strategic defenses.

She was program manager for the Sunshield on communication satellites for Raytheon and technical director of Raytheon's multimillion-dollar Research and Development Program.

A former astronaut candidate, Finman serves as president of Discover Technology, a nonprofit that promotes STEM.

Ed Penhoet

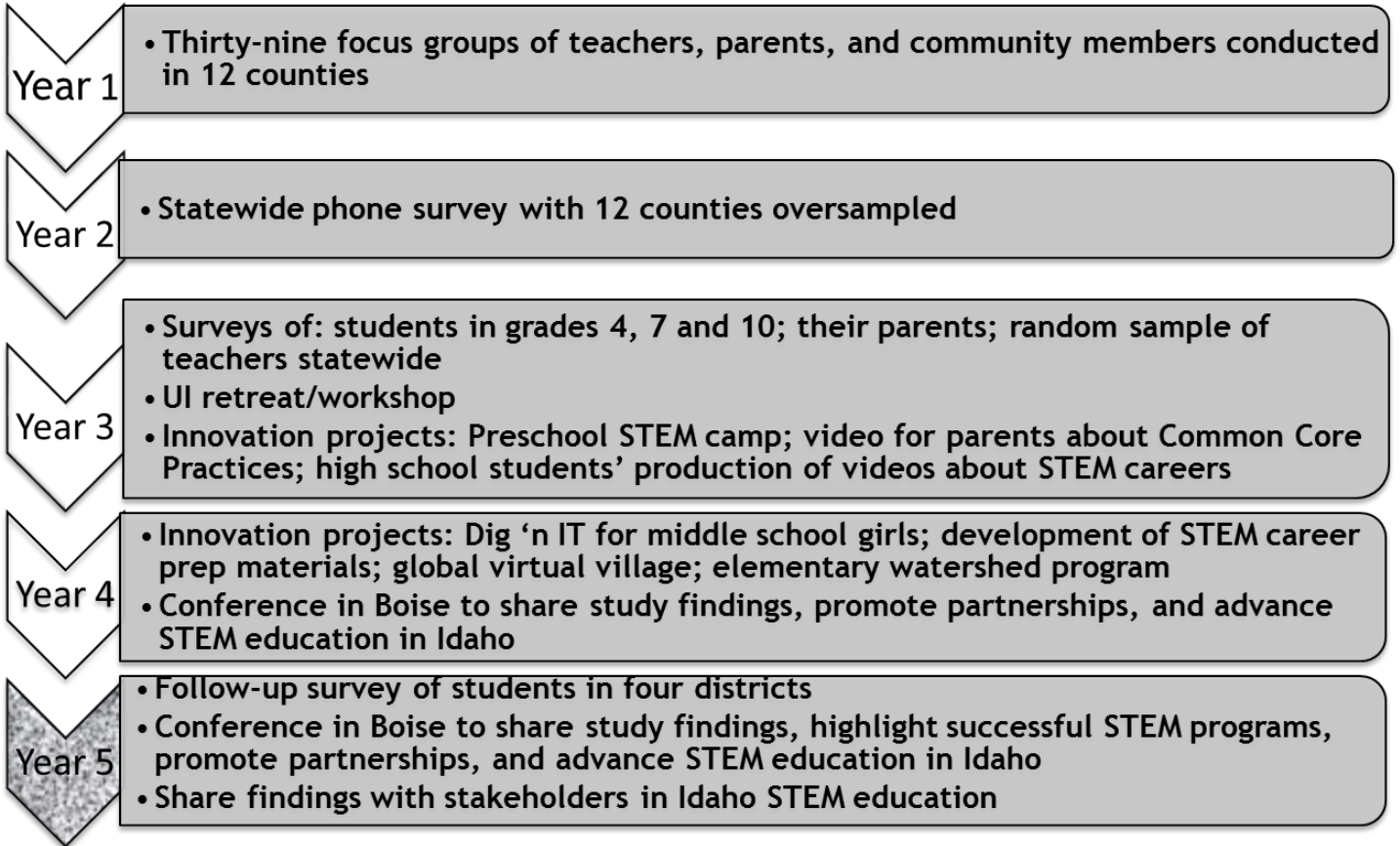
Ed Penhoet has been a member of President Obama's Council of Advisors on Science and Technology (PCAST) since the group's creation in 2009. As a member of PCAST, Penhoet is part of an advisory group of 19 of the nation's leading scientists and engineers, appointed by the President to augment the science and technology advice available to him from inside the White House and from cabinet departments and other Federal agencies.

Penhoet was a co-founder, president, and chief executive officer of Chiron, a highly successful biotechnology firm, from 1981-1998. He was a biochemistry faculty member at the University of California, Berkeley, and from 1998-2002 served as the Dean of the School of Public Health.

Penhoet has served in both member and executive roles on numerous boards, foundations, and other professional associations. In 2000, Penhoet joined Alta, a leading venture capital firm in life sciences, where he is currently a full-time director.



UI-Micron STEM Education Research Initiative



District Partners

The map shows the twelve communities selected to participate in focus groups and surveys of students and their parents. The adult and teacher surveys included randomly selected participants from the entire state.

Website

Website with reports, publications, and other information:

www.uidaho.edu/research/stem/micronstemed

Idaho Student and Teacher Surveys' Findings

Leontina Hormel



Leontina Hormel is an associate professor in the Department of Sociology and Anthropology at the University of Idaho. Her research and teaching are in the areas of political economy, inequalities (social class and gender), and research methods (qualitative and quantitative).

With experience conducting research in post-Soviet societies and in the U.S., Hormel brings to the project her experience with mixed-method research and comprehension of structural contexts affecting communities. Her previous work involved a community study in Komsomolsk, Ukraine, using survey and ethnographic methods to assist the city's municipal government in assessing residents' living conditions. She has worked on the STEM Social Science Research Team since 2010.

Susan Stauffer



Susan Stauffer is a research associate in the College of Education at the University of Idaho. She is a former statistics and mathematics teacher and department chair at Boise High School. She has bachelor's degrees in chemistry and secondary education, and a master's degree in adult education. Stauffer brings her professional experience as a high school teacher, her statistical and scientific research expertise, and her commitment to education to this project. She assists in the development of surveys; technical writing; and facilitating conferences and innovation projects in partnership with schools, industry, communities, and educators. She has worked on this study since 2012.

Presentations

Session I

9:30 — 10:15 a.m.

Aspen:

Designing and Supporting STEM-Based Programs During Out-of-School Time

Andrew Fletcher, Program Director for 21st Century Community Learning Centers Afterschool Program in the American Falls School District

Cinnabar:

You Have to START to Finish

Chris Guthrie, Workforce Development Specialist at Partners for Prosperity

Liberty:

FIRST Robotics – Engaging Students in STEM

Jay Sneddon, Founder of TEAM Tesla, Twin Falls

North Star:

Degree Programs in Idaho that Prepare Students for High Demand STEM Careers

Amy Moll, Professor of Materials Science and Engineering and Dean of the College of Engineering, Boise State University

Larry Stauffer, Professor of Mechanical Engineering and Dean of the College of Engineering, University of Idaho

Session II

10:30 — 11:30 a.m.

Aspen:

Aligning Teaching to Integrated STEM Core Practices to Create the STEM Literate Citizenry Needed in the Future Workforce

Anne Seifert, K-12 Education Manager, Idaho National Laboratory (INL)

Cinnabar:

MAKING + Libraries = STEMtastic!

Erica Compton, Project Coordinator, Idaho Commission for Libraries

Liberty:

Project SOS - From Activities to Action Using STEM to Save Energy

Kathleen Ryan, Assistant Professor, Interior Design, School of Design and Construction, Washington State University

Christine Berven, Associate Professor of Physics, University of Idaho

North Star:

Bringing STEM & Inquiry to an Elementary Classroom

Kim Miller, 2nd Grade Teacher, Barbara Morgan STEM Academy in Meridian

Session III

11:30 a.m. — Noon

Aspen:

Future City: THE FREE Middle School Project Based STEM Program for EVERYONE!

Lynn Olson, Idaho Regional Future City Coordinator

Melyssa Ferro, Earth, Life and Advanced Science Teacher, Syringa Middle School, Caldwell

Karissa Hardy, Idaho Regional Future City Steering Committee Member and Engineer Mentor, Lake Hazel Middle School
Students: Maddison Grunig, Elliot Hardy, Andrew Keller, Kylie Laurandean, Yohan Lim, Nikki Taylor, and Amanda Walker

Cinnabar:

ForesTree & STEM

Betty Munis, Director, Idaho Forest Products Commission

Liberty:

Collaborative Initiatives to Address STEM Careers in Manufacturing in North Central Idaho

Raymond Dixon, Assistant Professor of Engineering and Technology Education, University of Idaho

Christine Frei, Executive Director, Clearwater Economic Development Association (CEDA)

North Star:

iSTEM from Excellence: Dynamic After School Learning Environments Changing the Equation in Elementary Education

Sarah Halsted, Program Director, Lakeland School District's iSTEM from Excellence

Session IV

2:00 —3:00 p.m.

Aspen:

How Cold is Cold? Classroom Cryo 101

Chad Houck, Director of Operations, Discover Technology

Cinnabar:

The Confluence Project: Project-Based Watershed Science

Audrey Squires, Program Coordinator, The Confluence Project (TCP)

Cindy Rust, Teacher, Post Falls High School

Rusti Kreider, Teacher, St. Maries High School

Liberty:

Tech GEARS Framework and Professional Development to Support Technology Integration in Idaho K-12 Schools

Cassidy Hall, Technology Integration Specialist, Doceo Center for Innovation + Learning and Assistant Professor, University of Idaho

North Star:

Going Beyond the Hour of Code

Heidi Pluska, Chemistry Teacher, Timberline High School and Code.org Affiliate, the State of Idaho

Session V

3:00 — 3:30 p.m.

Aspen:

Sneak Peek at Discover Technology's Mobile STEM Lab

Chad Houck, Director of Operations, Discover Technology

Cinnabar:

"Throw and Catch Pebbles" Mathematical Game

Jackie Maximillian, Post Doctoral Fellow with Environmental Science, University of Idaho

Ivan Mucyo Ngabo, Chemical Engineering Student, University of Idaho

Liberty:

Exploring Intersections: A Unique, New Partnership-in-Progress

Kristine Barney, Executive Director, Discovery Center of Idaho

Jim Fredricksen, Associate Professor of English Education and Co-Director of the Boise State Writing Project, Boise State University

North Star:

STEM Fun in the Sun: Using Summer Science Camps as Professional Development

Amy Christopherson, Director, CSI Mini-Cassia Center, and Adjunct Biology and Education Instructor

Session VI

3:45 — 4:15 p.m.

Aspen:

University of Idaho College of Natural Resources McCall Outdoor Science School

Mark Beaver, MOSS Maintenance Coordinator, University of Idaho

Cinnabar:

The Children (& their technology) Are Our Future

Brooke Lacey, Founder of Tech Savvy

Liberty:

The Boise WaterShed: A Community Collaboration Project

Jan Smith, Master Teacher for IDoTeach, Boise State

Cindy Busche, Environmental Education Coordinator, Boise WaterShed Education Center

Eian Harm, Research and Special Projects Coordinator, West Ada School District

North Star:

Using Scratch to Increase Digital Literacies and Promote Technological Careers

Terence Soule, Professor of Computer Science, University of Idaho

Session VII

4:15 — 4:45 p.m.

Aspen:

Invent Idaho: Inspire! Ignite! Invent!

Scarlett Randall, Regional Coordinator, Invent Idaho

Cinnabar:

IDLA is More than Courses

Sherawn Reberry, Director of Education Programs, Idaho Digital Learning

Niki Walker, Blended Learning Program Manager, Idaho Digital Learning

Liberty:

Think Through Math

Marisa Alan, State Director of Implementation for Idaho and Utah, Think Through Math

North Star:

Idaho Career Information System: Fostering STEM Career Awareness

Sara Scudder, Idaho Career Information System, Idaho Department of Labor

K-12 Education Partners

Each of the following was listed in at least one oral presentation proposal as an educational partner:

Andrea Pettitt Group One Real Estate
JUB Engineers
Power Engineers
4H
AECOM
American Forest Foundation
American Geotechnics
American Society of Agricultural and Biological Engineers
ARC Document Solutions
Avista Utilities
Benewah Medical/Wellness Center
Boise State University
Boise WaterShed
Bonneville Power Administration
Boy Scouts of America
Bureau of Reclamation
CH2M Hill
Citizen Scientific Workshop
Clearwater Economic Development Association
Clearwater Power
Code.org
Coeur d'Alene Tribe Lake Management Department
College of Southern Idaho
Connecting Idaho Partners
Decagon Devices
Department of Environmental Quality
Department of Fish and Game
Discover e
Discover Technology
Discovery Center of Idaho
First Robotics
Future City Competition
Gem Bar Chain/Aqua Jet
Geo Engineers
HDR, Inc.
Hewlett-Packard
Hillco Technologies
Hydraulic Warehouse/Ende Machine & Foundry
Idaho Community Foundation
Idaho Department of Education
Idaho Department of Environmental Quality
Idaho Department of Fish and Game
Idaho Department of Labor
Idaho Department of Lands
Idaho Digital Learning (IDLA)
Idaho Firewise
Idaho Forest Products Commission
Idaho Museum of Natural History
Idaho National Laboratory (INL)
Idaho Power
Idaho Public Libraries
Idaho Society of Professional Land Surveyors
Idaho State Board of Education
Idaho State Department of Education
Idaho State University
Idaho Weed Awareness Campaign
Inland Power and Light
Institute of Electrical and Electronic Engineers
Institute of Museum and Library Services
Institute of Transportation Engineers – Idaho Chapter
Intermax Networks
Invent Idaho
iShoutOut
JA and Kathryn Albertson Foundation
Kittelson & Associates
Kootenai Electric
Land Group, Inc.
Lewis-Clark State College
Local Highway Technical Assistance Council
Lowe's
Maker Media
Micron Foundation
Micron Technology
MWH Global
NASA
National Council of Examiners for Engineering and Surveying
NSF
One Sky/One Earth Food Coalition
Oregon Museum of Science and Industry
Palouse Basin Water Summit/Aquifer Committee
Palouse Clearwater Environmental Institute
Palouse Discovery Science Center
Partners for Prosperity (P4P)
PCS Edventures!
Precision Machine and Supply
Professional Technical Education
Rathdrum Power
Selkirk Outdoor Leadership and Education
Southeast Washington Economic Development Association
STEM Idaho
STRATA, Inc.
Tech Savvy
The Lands Council
Time Warner Cable
T-O Engineers
U.S. Bureau of Land Management
U.S. Department of Labor
U.S. Forest Service
University of Idaho
U.S.D.A.
Verizon Foundation
Washington State University
WH Pacific, Inc.

Abstracts

Session I - 9:30-10:15 a.m.

Aspen:

Designing and Supporting STEM-Based Programs During Out-of-School-Time

• **Andrew Fletcher** is a program director for 21st Century Community Learning Centers Afterschool Program in the American Falls School District serving students K-8. Over the last five years, he has trained afterschool educators in providing various STEM related activities to foster student engagement and inquiry. Fletcher has provided a hands-on regional professional development for STEM activities. He has also presented at the Idaho State Prevention and Support Conference. He has facilitated family events to help promote science awareness. Fletcher has dual degrees in English and philosophy and is currently working on a secondary teaching certificate.

ABSTRACT

Research shows that early engagement and interest in STEM fields and careers by eighth grade was a more accurate predictor of getting a science-related college degree than were math or science test scores (Tai, 2006). Part of the 21st Century Community Learning Center initiative is emphasizing STEM as a priority area for its grantees. And why not? Afterschool and summer programs are an ideal place to offer engaging, hands-on STEM learning programs that foster inquiry-based learning, excitement, and expanded learning opportunities. In this presentation, you will learn about research-based practice on how to design and support a STEM-based learning program: STEM content, staff training, partnerships, and resources. You will also take home a bundle of practical activity ideas to use in your classroom or afterschool program. From one-day activities such as combining Diet Coke & Mentos to full units such as Roller coaster Physics. Let's be the source that engages student interest in pursuing a STEM career by exposing students to hands-on activities.

Cinnabar:

You Have to START to Finish

• **Chris Guthrie**, workforce development specialist at Partners for Prosperity, has been with Partners for Prosperity for 10 years working to effectively reduce poverty in Eastern Idaho. Although employed by Partners for Prosperity her home base is Idaho State University (ISU) where she currently works to assist potential students as they transition in to college.

ABSTRACT

Education is a critical part of reducing poverty, and STEM education, along with its career pathways, plays a vital role in lifting families out of poverty. *But how do we connect people to that education and how do we prepare them for success? How do we help people who may have been out of the education system for a while and may not have the math skills necessary for success?*

Partners for Prosperity (P4P) is a community-based organization with a mission to reduce poverty by building assets and connecting people with opportunities. STEM education has a vital role in this effort because it leads to high demand jobs that pay a living wage and can dramatically impact financial well-being. Since 2007 P4P has partnered with ISU on various programs the link education with low income and underserved populations. P4P works with ISU's START program to provide the tools for transition into STEM education fields. The START program helps students navigate the education system as well as beef up their math and other skills. This session will focus on the practical application of linking students to STEM education opportunities. We will focus on the *How* and the *What* by looking at the START program and the lessons learned about putting students into post-secondary education and setting them up for success. We will examine the different parts of START as well as some of the outcomes related to student success.

Liberty:

FIRST Robotics – Engaging Students in STEM

• **Jay Sneddon** is the founder of TEAM Tesla, a youth robotics organization located in the Twin Falls area. Started in 2010, TEAM Tesla has grown to 10 different robotics teams with over 100 students from a dozen different public, charter and private schools. Those robotics teams have won major awards in Idaho, Wyoming, Utah, Nevada, Montana and California. This year, Tesla will mark the fourth year in a row where at least one of its teams is represented at the FIRST (For Inspiration and Recognition of Science and Technology) Robotics World Championship in St. Louis, notable since less than half of one percent of robotics teams qualify. Sneddon has a degree in electrical engineering, and a master's in computer information systems. He is currently director of the Data Center at the College of Southern Idaho.

ABSTRACT

Recent studies have noted that students who participate in FIRST Robotics are twice as likely to major in science or engineering in college. Eighty-nine % of FIRST alumni are in a STEM field as a student or professional. Lastly, because of FIRST, 86% of participants indicate they are more interested in doing well in school (Loehr Educational Consultants, 2012). Nationally, over \$16 million in college scholarships are specifically available to FIRST graduates, including ones from Boise State and Idaho State University. So, why is FIRST so effective in engaging students in STEM and why are so many colleges recruiting FIRST graduates? Jay Sneddon, founder of TEAM Tesla, explores the STEM engagement piece of FIRST Robotics and why it works for all K-12 age groups. This presentation will explore the FIRST program, how FIRST may be incorporated in classroom curriculum, and how to organize a robotics team for your school or community.

North Star:

Degree Programs in Idaho that Prepare Students for High Demand STEM Careers

• **Amy Moll** is a professor of materials science and engineering and dean of the College of Engineering at Boise State University. Moll received a bachelor's degree in ceramic engineering from University of Illinois, and master's and doctorate degrees in materials science and engineering from University of California at Berkeley. Following graduate school, Moll worked for Hewlett Packard. She joined the faculty at BSU as an assistant professor in mechanical engineering in August 2000. Along with Bill Knowlton, Moll founded the Materials Science and Engineering Program at BSU and served as the first chair. In February 2011, Moll became Dean of the College of Engineering. Her research interests include microelectronic packaging, particularly 3-D integration and ceramic MEMS devices. She especially enjoys teaching the Introduction to Engineering and Introduction to Materials Science and Engineering courses as well as engineering outreach activities.

• **Larry Stauffer** is a professor of mechanical engineering and dean of the College of Engineering at the University of Idaho. Stauffer received a bachelor's degree in mechanical engineering and a master's in agricultural engineering from Virginia Polytechnic Institute and State University. He worked for Westinghouse Electric Corporation for five years and then earned a doctorate in mechanical engineering from Oregon State University. Stauffer joined the faculty of the University of Idaho in 1987 and has served in various capacities in both Moscow and Boise. His research focuses on mechanical design and manufacture. He has extensive experience assisting private industry in these areas and is a licensed professional engineer.

ABSTRACT

Current STEM initiatives often lump all science, technology, engineering, and math majors together. While the primary focus of STEM initiatives in a K-12 setting may be developing students' general interest in technical fields, the reality is that not all STEM fields are alike. Some STEM majors prepare students for careers that are in high demand and some in fields with many more applicants than positions. Some STEM careers require four or more years of college and some less.

In this presentation we provide an overview of STEM careers that are in high demand and the post-secondary degree programs that are available in Idaho to prepare students for them. We will also discuss how students can best prepare themselves for these majors while in high school and the new AP Introduction to Engineering course that will likely be introduced by the College Board in 2018. We will also discuss why improving diversity in these fields is especially important and how K-12 educators can support this effort.

Session II - 10:30-11:30 a.m.

Aspen:

Aligning Teaching to Integrated STEM Core Practices to Create the STEM Literate Citizenry Needed in the Future Workforce

- **Anne Seifert**, K-12 Education Manager, Idaho National Laboratory (INL), completed an educational specialist degree in educational leadership. As a veteran educator, Seifert has been involved in school reform, assessment, and school improvement efforts and has served as an advocate for STEM education. Seifert works aggressively to address challenges facing educators as they seek to reform teaching and learning in STEM. Her work involves coordinating partnerships with educators, higher education, state agencies, business, industry, and community-based partners to raise the awareness for STEM in an effort to arm students with necessary skills of the 21st century in preparation for the workforce of tomorrow.

Seifert believes that teachers, empowered with resources and professional development, can positively impact students, inspiring them to advance their studies in STEM so that they are prepared to make informed decisions that will positively impact STEM innovation and the way they live, how they live, and our nation's resources and security.

ABSTRACT

Using the experience of engaging over 3,000 K-12 educators in an INL-led initiative, involving industry, businesses, agencies, community-based organizations, government, Idaho State Board of Education, Idaho State Department of Education, and i-STEM, we have designed a series of tools and activities that enhance teacher capacity to teach aligned to core STEM practices (e.g. NGSS and CCSS-M). We will guide our participants through an integrated activity that applies the core practices and provides a common context for exploration of teaching. As a group we will explore development and implementation of hands-on STEM activities that further students' learning and develop a rubric that can be used to determine the extent to which students apply and engage in the practices, integrated STEM concepts, and 21st century skills.

Our very interactive session will require participants to engage in hands-on, minds-on activities and then contemplate and share how they will use the process and tools (e.g. practices assessment rubric) provided in their STEM teaching. We will place emphasis on the importance of an innovation and creativity mindset to effectively teach and assess student learning aligned with core STEM practices. The outcome will be enhanced teacher's knowledge to better engage and prepare Idaho students to become the scientists, engineers, and problems-solvers of the future that we and other highly technical workforce employers want and need.

Cinnabar:

MAKING + Libraries = STEMtastic!

- **Erica Compton** has over 20 years of experience in STEM education. Compton co-founded an education company that developed a product for teens to design and build 3-D environments to address complex challenges and interact in those environments in fully-immersive virtual reality. She's trained across the U.S., working with science museums, Boys & Girls Clubs, and public schools. Compton joined the Idaho Commission for Libraries in 2010 as a project coordinator. She co-developed the Make It at the Library project in 2012 with the goal of creating "makers" through innovative out-of-school learning opportunities in libraries. Now in year three, the project has 21 libraries participating and is pushing the limits of programming. The project has garnered national attention for its unique, statewide approach and focus on creating makers, not spaces.

ABSTRACT

Offering rich and engaging out-of-school programming is an important step toward preparing our youth for the future. Idaho libraries are at the heart of many communities and perfectly poised to provide rich and meaningful learning opportunities during out-of-school time. And since the typical 18-year old has only spent 18% of his or her time in formal educational settings, out-of-school time is critical.

The Idaho Commission for Libraries developed and launched the Make It at the Library project in 2012 to implement innovative “maker” programming in libraries across the state. In year three we have 19 public libraries and two school libraries offering everything from soldering and programming to 3-D design/printing and robotics. These libraries are located in communities large and small and in 2014 reached over 23,064 teens and tweens through in-house and outreach programming.

Join us and explore electricity through Squishy Circuits and Circuit Boards, learn how to build a banana piano using a MaKey MaKey, and see how 3-D printers really work. These activities are not only fun, they teach critical thinking, creativity, and 21st century skills which the Common Core and the new Next Generation Science Standards emphasize.

Session Objectives:

1. To introduce participants to a variety of activities which foster critical thinking and creativity and to present new tools, technologies, and materials that can be used in out-of-school programming.
2. To share information and lessons learned from the Make It at the Library project.
3. To inform participants about the importance of making for children of all ages.

Support materials, activities, and examples are available to anyone in the community wishing to access them through the Idaho Commission for Libraries’ website and will be highlighted during the workshop.

Liberty:

Project SOS - From Activities to Action Using STEM to Save Energy

• **Kathleen Ryan**, Assistant Professor, Interior Design, School of Design and Construction, Washington State University, Pullman, WA. Ryan's research and teaching interests include investigation of the components of successful collaboration across disciplines and age-groups; the development of supportive built environments to enable informal learning; innovation in collaboration for learning; building rural communities through participatory design that incorporates University and Community engagement in design decision-making. She is also the co-director for the Rural Communities Design Initiative at Washington State University. Ryan’s professional practice includes almost 30 years as an energy consultant and interior designer. Her design practice encompassed the development of environmental and interpretive graphics in public spaces. Current projects include the development of informal learning exhibits for rural middle-school children, where we bring the science of physics, sustainability and design to rural communities through hands-on exhibits. She serves as the Lead Principal Investigator for Project SOS at Washington State University.

• **Christine Berven** Ph.D., Associate Professor of Physics, Department of Physics, University of Idaho, Moscow ID. Her research interests include nano-device transport physics, nano-sensor physics, applied physics/ energy-storage solutions for renewable energy sources, and physics education research. Her teaching activities include teaching conceptual-level astronomy, general-studies Physics in Everyday Life, calculus-based first year mechanics, theoretical mechanics, and senior- and graduate-level solid-state materials physics and engineering. She has prepared and performed numerous physics demonstration shows for middle-school-aged youth including the Physic of Wind Instruments show for the attendees of the University of Idaho Lionel Hampton Jazz Festival. Dr. Berven’s role on Project SOS is as Principal Investigator at the University of Idaho, with duties including consulting on exhibit design, experiment design, and the overall physics content of the materials.

ABSTRACT

Project SOS: Making Connections Using The Science Of Sustainability is an Informal Science Education Pathways Project funded by the National Science Foundation (NSF) designed to teach the science of sustainability to middle-school aged youth and their care-givers in rural, underserved communities of northern ID and eastern WA. The goal was to develop an informal science outreach program to teach:

- 1) the physics of heat energy transfer,
- 2) how to detect heat loss in a home, and
- 3) how to fix problem areas in order to save energy.

The project team created a one-day program using hands-on activities, demonstrations, portable exhibits, model houses, and energy audit kits. Through the use of a cooperative learning model, youth worked as teams to do all activities, including improving the energy efficiency of a model house. The youth were then shown how to use their new knowledge and their energy audit kits to become “heat science detectives” to evaluate the most likely energy loss mechanisms and locations of heat loss in their own homes.

The youth and their families attended a follow-up event at the Palouse Discovery Science Center where they shared the results from their home investigations, learned how to fix problem areas with materials donated by local power companies, received information about careers, and explored the science center. This presentation will highlight the details of the main components of Project SOS and will provide information about how these components have been used and can be used in the future in both formal and informal STEM education settings. The presentation will include demonstration of the heat transfer hands-on activities that are readily available to implement in a variety of educational settings.

North Star:

Bringing STEM and Inquiry to an Elementary Classroom

• **Kim Miller** is a 2nd grade teacher at Barbara Morgan STEM Academy in Meridian, Idaho. She has 23 years experience in integrating technology into a primary classroom. Miller is also a Discovery Educator Star, and serves on the Idaho Leadership Council for Discovery Education. She provides training for Discovery Education, technology integration, and STEM for schools and districts in the state of Idaho. She has been named building Teacher of the Year three times, selected to attend the Discovery Education Summer Institute three times, and has won lesson-planning awards through Digital Learning Day. Miller has also led school technology teams, and designed and implemented iPad integration projects at the school level.

ABSTRACT

Wondering how to integrate technology with STEM and Inquiry Learning with elementary students? This is the session for you. We will explore projects that bridge the gap between ideas and implementation. You will leave with lots of resources that are ready to implement in your lesson plans next week.

During this workshop participants will be learning about 12 different STEM and Inquiry Learning projects that incorporate technology and encourage problem-solving and creativity from students. Each project will include resources, equipment needed, full description, steps to implementation, and example videos of student participation.

Projects include:

- Video-conferencing with inquiry lessons and experiments while collaborating with classrooms around the world
- Math in our world video explanations: Students find examples of math in their world and create video explanations to share the connection with their classmates through a blog or shared workflow space
- Exploring outside the classroom walls to create presentations of learning and understanding for skills such as sorting, classifying, explaining, and demonstrating
- Using high engagement technologies of green-screening and animation to engage students in math and science topics
- Strategies for helping students learn how to make observations, make inferences, and ask questions using images, engaging live demonstrations, and objects for exploration
- Screencasting math problems as an alternative to paper and pencil homework and assessments
- Video science journals created by students using step-by-step procedures and data collection that are then shared through a blog or shared workflow space

Participants will leave with ideas and projects that can be easily implemented into their lesson plans. A Symbaloo of STEM and Inquiry Learning resources for elementary teachers will also be shared.

Session III - 11:30 a.m.-Noon

Aspen:

Future City, THE FREE Middle School project Based STEM Program for EVERYONE!

- **Lynn Olson** – Idaho Regional Future City Coordinator. Following graduation from Gonzaga University with a bachelor's in civil engineering, Olson's professional career began for the first 14 years working as a consulting engineer specializing in land development, bridge hydraulic and river floodplain analysis. After earning her professional engineering license in 2002, she began to volunteer for a number of STEM outreach programs with the Idaho Society of Professional Engineers including in 2004 the first year of the Idaho Future City program. Olson began coordinating recruitment of teachers and engineer mentors for the program and since 2010 has overseen the program as the Idaho Regional Future City Coordinator. She currently works at Boise State University in the College of Engineering where she advises engineering students, assists in the National Science Foundation Scholarship program and continues her outreach and recruitment efforts to encourage more students into the STEM fields.
- **Melyssa Ferro** – Earth, Life and Advanced Science Teacher, Syringa Middle School, Caldwell, ID. After transferring college majors from lab scientist to science educator and graduating from Boise State University with a bachelor's in biology, secondary education, Ferro has spent the last 16 years of her career dedicated to providing hands-on and enriching science and engineering experiences for students in the Caldwell School District. She has earned a master's in middle level education from Walden University and has focused her STEM education pursuits on teaching life and earth science at Syringa Middle School. Ferro is the coordinator for the Science and Math Bowl competition team and the summer MASSI program at the College of Idaho as well as leading the Habitat H2O Florida trip and the Expedition Yellowstone experience. She facilitates several teams for the Future City engineering competition as part of her advanced science curriculum. Ferro is the STEM coordinator for Caldwell and currently serves on the Idaho Science Standards Adoption Executive Committee.
- **Karissa Hardy** – Idaho Regional Future City Steering Committee member and Engineer Mentor and Parent for Lake Hazel Middle School Hardy has earned a bachelor and a master of science degree in civil and environmental engineering (BYU, UMass Lowell). She is a professionally licensed (PE) and practicing civil engineer in the Boise Area, employed with the Local Highway Technical Assistance Council. Her professional work has included civil design and environmental engineering. She has a passion for encouraging young students to consider careers in STEM fields and has been involved in various mentoring programs over the last seventeen years. She now focuses her mentoring and volunteering efforts on curbing the decline in young women pursuing careers in engineering fields. Hardy has spent the last five years volunteering with the Future City Program as a parent with two sons, as a judge, as a steering committee member and as an engineering mentor.
- **Students Lake Hazel Middle School**—Lake Hazel completed their fifth year participating in the Idaho Regional Future City competition in January of 2015. After receiving first place in the Idaho Region in 2015, these students traveled to Washington D.C. to participate in the National Future City Competition in February of 2015. Lake Hazel Future City is a club run with two teams, and is completely run by parent and teacher volunteers. The club meets one day a week after school and occasionally on Saturdays. The winning Lake Hazel Team was comprised of five 6th grade students and two 7th grade students. (Team members: Maddison Grunig, Elliot Hardy, Andrew Keller, Kylie Laurandean, Yohan Lim, Nikki Taylor, and Amanda Walker)

ABSTRACT

The Future City Competition engages middle school students in STEM through a project-based learning experience that challenges them to imagine, design, and build cities of the future. The program is active in 39 regions across the United States, including 11 years in Idaho and is also available in other countries under the support of DiscoverE, formerly the National Engineers Week Foundation.

Working as a team of as few as three students to an entire classroom, the students research and propose solutions to a different engineering challenge each year. Along the way, students can explore career options through the many different types of engineering while learning how their communities work and becoming better citizens.

This session will consist of a general presentation including program facts and impacts of this flexible, cross-curricular educational program. Future City provides students an opportunity to do the things that engineers do—identify problems; brainstorm ideas; design solutions; test, retest and build; and share their results. With the engineering design process at its center, Future City is an engaging way to build students' 21st century skills. A program handbook will be provided for the first 150 participants with direction to additional online tools available for this FREE program.

Ferro will provide a first-hand account of how students applied math and science concepts to real-world issues while meeting their curriculum objectives. Karissa Hardy, who has experienced the Future City program from the perspective of both a mentor and parent, will highlight how the program can be structured as an extra-curricular activity outside of classroom.

Finally, members of teams from the 11th Idaho Regional Future City from Lake Hazel Middle School and Syringa Middle School will present their Future City to demonstrate their skills in public speaking, problem solving, teamwork and project management gained through Future City.

Cinnabar:

ForesTree & STEM

• **Betty Munis** is the director of Idaho Forest Products Commission, which provides information and education about Idaho's forests and the forest products industry to the people of Idaho. Munis grew up on a ranch in Montana. When she's not conducting IFPC business, you may find her growing tomatoes and other prize-winning produce, traveling, or enjoying time with her family, including Hazel the dog.

ABSTRACT

For over 20 years, Idaho Forest Products Commission has been the "go-to" destination for learning and teaching about Idaho's forests and forest products. Our flagship education program, Project Learning Tree, has served thousands of teachers through high-quality professional development classes – both in the classroom and out in the forest.

This session will highlight four STEM education resources & opportunities for teachers, counselors and others who work with PreK-12th grade youth.

- 1) Sustainable Forestry Tour for Teachers & Counselors, an amazing weeklong experience, all expenses paid, in the forests of northern Idaho.
- 2) Project Learning Tree 1-credit workshops,
- 3) Papermaking and Forest Tools lending kits and other free resources,
- 4) Forest Education Grants, and
- 5) STEM-related careers in Idaho's natural resource fields – forests in particular. You'll leave the session with some of the resources in your hands.

Liberty:

Collaborative Initiatives to Address STEM Careers in Manufacturing in North Central Idaho

• **Raymond Dixon** is an assistant professor of engineering and technology education in the College of Education, University of Idaho. He has a doctorate in human resource development and engineering/technology education. His experience spans industry as an engineer and a training and program development specialist, and in education as a teacher, instructor, lecturer, and administrator. His research focus is on STEM integration, expert performance in design, and workforce development. He is a fellow of the National Center for Engineering and Technology Education, and ITEEA, CTETE leadership Institute.

• **Christine Frei** is the executive director for Clearwater Economic Development Association (CEDA), and works with regional leaders and CEDA staff to develop and implement strategies for economic diversification, community development, and increased prosperity in the Idaho counties of Latah, Nez Perce, Lewis, Clearwater, and Idaho. Frei has 14 years of experience in planning and implementation and helping businesses and communities access needed resources. Since 2010, Frei has been active in north-central Idaho in working with manufacturer business and education partners to identify the most critical workforce issues and develop a system to address them. Frei has a bachelor of science from Lewis-Clark State College and a masters degree from Loyola University New Orleans. She is a certified Professional Community and Economic Developer (PCEP) and grant administrator.

ABSTRACT

Addressing the workforce development for jobs in the STEM fields is critical for the sustenance of businesses that are a part of emerging occupational clusters in Idaho. In fact, the benefits to community are mutual because this will provide careers and living wages for young graduates from high schools and technical colleges in the region. In North Central Idaho, data from the Department of Labor points to the rapid growth and workforce needs of the Northwest Intermountain Metal Manufacturer Supercluster. However, for students to capitalize on these opportunities then their STEM identity will need molding from high school. This cannot be achieved by schools alone, but must constitute a collaborative effort between different stakeholders. This presentation will highlight the progress of funded work and other initiatives that are being done by the Clearwater Economic Development Association, Department of Labor in Lewiston, the University of Idaho, Lewis Clarke State College, and various manufactures in North Central Idaho and Eastern Washington. At the heart of this initiative is the orientation and preparation of students from high school with competency to access STEM careers in manufacturing. Dr. Dixon from the University of Idaho will discuss the research done to identify and rank the occupational needs and develop a competency profile for each job areas – machinists, fabricators, electronic technicians, machine technician, and quality assurance supervisors. Christine Frei, Executive Director of CEDA will discuss specific initiatives that involves sensitizing educators, students, parents, and leaders in the region about STEM opportunities in manufacturing through structured tours of manufacturing facilities, information sessions, strategic initiatives such as Dream It Do It, and the development of a manufactures' endorsed curriculum that students can pursue as they complete their high school diploma, and which will certify that they are competent to be employed in entry level STEM fields in manufacturing.

North Star:

iSTEM from Excellence: Dynamic After School Learning Environments Changing the Equation in Elementary Education

• **Sarah Halsted** is the Program Director for the Lakeland School District's after school STEM enrichment and teacher professional development co-programming, entitled iSTEM from Excellence. She earned her B.S. in Environmental Science from The George Washington University, and her M.A.Ed. from Pacific Lutheran University.

ABSTRACT

In 2013, Lakeland School District and University of Idaho Extension Water Education program completed a Micron/UI STEM Education Research Initiative Pilot Project called iSTEM from Excellence, led by Jim Ekins and Sarah Halsted. This STEM after school enrichment for 4-6th grade Lakeland students became the platform for igniting student excitement in STEM, while providing a "safe" space for teachers to increase STEM content knowledge and pedagogical confidence/efficacy. This dynamic learning environment was designed to inspire students toward lifelong learning, especially in STEM topics. Practice in the informal setting gives teachers a more relaxed atmosphere to increase proficiency in STEM content and guided inquiry pedagogy. The project also supported yearlong STEM professional development and a District wide STEM coordinator to further enrich teacher depth of knowledge. New partnerships with regional professionals showcased STEM professions, and tapped into resources and data to engage students and teachers in authentic place-based investigations. Additionally, parent support included a website with animations, videos, and actual content taught in-class, empowering parents to become co-learners with their students and more robustly supporting community-wide STEM education.

Preliminary data from 2013-2014 indicate over 60% of students reported an increase in their interest in science and pursuing professional STEM fields due to their experience in the program. Eighty-two percent of students reported a desire to continue in programming the following year. There was an average of 41% increase in teacher content knowledge (range = 21 - 60% increase). The majority agreed their confidence increased in facilitating hands-on guided inquiry due to the program structure. Parent surveys voiced strong support for the iSTEM from Excellence program and appreciation for the web resources, and expressed a desire for more hands-on, place-based, applied learning for students. Implementation strategies based on survey results and lessons learned will be presented along with watershed education resources.

Session IV - 2:00 - 3:00 p.m.

Aspen:

How Cold is Cold? Facts, Fables, and Fun for Cryo in the Classroom

• **Chad Houck** was initially the program director and now is director of operations for Discover Technology. Houck has spent the last three years helping to develop and grow the Discover Technology program in Southwest Idaho. He is an avid public speaker and presenter, and has led discussions and served on panels for multiple STEM forums in Idaho. He is an accomplished project manager, having completed several innovative projects in learning environments and immersive user experiences, not the least of which is the creation of the Discover Technology/Micron 60' STEM Mobile Discovery Lab. Houck is a graduate of the University of Montana with a degree in business management and marketing.

ABSTRACT

Drawing from their experience in over 100 live presentations (to over 40,000 K-12 students), Discover Technology instructors will give you the tools and tricks to safely bring their most crowd-pleasing 'Liquid Nitrogen and Dry Ice' demonstrations into your elementary, middle, or high school classroom. With tie-ins to common core subjects of technical writing, math, and more, this session is for anyone curious about pulling excitement and fun into the classroom, and will wrap up with a "sweet" edible demonstration. (This will be a hands-on, participatory session. Notes will be made available for reference.)

Ties to Common Core Writing Literacy: WHST.6-8.1, WHST.9-10.1, WHST.11-12.1 "In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results." Also ties to the various math standards for "measurement and data" functions at almost all levels. (Negatives, positives, qualitative analysis, less than, greater than, etc.)

Discover Technology offers its one-of-a-kind Edu-tainment STEM Assembly and Mobile Discovery Lab experience to schools from K-12, in partnership with the Micron Foundation. Visit the Mobile Discovery Lab in the parking lot at today's events, and then visit <http://discovertechnology.org> to learn more or schedule Discover Technology for your school.

Cinnabar:

The Confluence Project: Project-Based Watershed Science

• **Audrey Squires** is The Confluence Project (TCP) program coordinator. Working alongside several university and non-university colleagues, Squires has designed TCP and implemented it in eight northern Idaho high schools. Squires received her master's in water resources from the University of Idaho in 2014. Her research focus was agricultural water quality and understanding the success of grassroots watershed organizations. Before coming to Idaho, Squires served as a Peace Corps volunteer in Guatemala, working with local villages to develop sustainable ecotourism projects and protect their natural resources. Squires is passionate about science, education, water, and collaboration.

• **Cindy Rust** is a dreamer that wants to change the way we educate. Rust wants to train people to educate themselves while assisting them in exploring their interests. She wants to show them how amazing the world around them is through the eyes of science while experiencing their local environment. Rust has been teaching in K-12 public education since 1996, experiencing both the Midwest and the West. This has taught her that kids are our greatest natural resource. We need to invest time, energy, and money in understanding how they learn and find methods to help them understand where their passion lies for incorporating it into a career. We need to bank on their creativity and individualism without losing a standard of rigor for all. Education must be thought of as a dynamic system not static. Within this system, we will find those that will be driven to improve our life on this planet as well as the planet's natural conditions.

• **Rusti Kreider** has been engaging youth in scientific activities for a total of 10 years, the last three full-time at St. Maries High School. She combines her love of nature and learning into meaningful experiences for students to pursue their own natural curiosities about science. This desire to create "real life" science for students has bolstered her collaborative efforts in developing The Confluence Project Watershed Science curriculum with fellow teachers Cindy Rust, Jamie Esler, and the

University of Idaho's Waters of the West team. This curriculum is so powerful in reaching a diverse population of students that Kreider participated in its presentation to teachers across the nation at the NSTA National Conference this year in Chicago. She continues to seek learning opportunities to better develop student understanding of science concepts inside and out of the classroom setting, and looks forward to challenging our youth in scientific thinking and application.

ABSTRACT

The Confluence Project (TCP) is the outreach arm of the University of Idaho's Waters of the West (WoW) program. It was piloted in 2013 by three WoW graduate students. These students became passionate about improving science education in Idaho after teaching in secondary science classrooms in rural communities. They were provided that teaching experience by the WoW Graduate STEM Fellows in K-12 Education program, funded by the National Science Foundation. After a year each of teaching, these graduate students saw that high school students could become more excited about and skilled in science through hands-on learning activities and, specifically, field-based, student-driven research. They created TCP as a partnership between WoW students and faculty, K-12 classrooms, a local nonprofit, and community experts from government agencies and private businesses. The partnership model blends the unique experiences, knowledge and skills from each entity. The diversity of partners also exposes high school students to the myriad careers available to them down the road. TCP's model is comprised of three watershed-focused units: water quality, agriculture and snow science. Each unit includes in-class pre-lessons in which students learn background information and design their field work; a field experience during which students collect data and connect with local professionals; and in-class post-lessons used for data analysis and application. After the field experiences, we challenge our students to hone their critical thinking skills by developing their own research projects focused on a local watershed issue of their choice and to propose a creative, science-based solution to it. In the spring, a confluence of TCP students occurs at University of Idaho for a two-day Youth Water Summit where they share their work. In this session, conference participants will learn the foundation of this project-based science education model and how to implement it in their classrooms, schools and watersheds.

Liberty:

Tech GEARS Framework and Professional Development to Support Technology Integration in Idaho K-12 Schools

• **Cassidy Hall** is the technology integration specialist for the Doceo Center for Innovation + Learning and an assistant professor in the University of Idaho's College of Education. Hall dedicated fifteen years to working in public education in Pennsylvania before relocating to Idaho. After earning a bachelor of science in broadcast journalism from West Virginia University, Hall pursued teaching certification. She received a masters of education in school library and information technologies in 2006 from Mansfield University in Pennsylvania. After spending nine years as a high school English teacher, Hall worked as a media specialist, technology integration coach and instructional coach at a rural school district in Southwestern Pennsylvania. She received training to support her coaching roles through Classrooms for the Future, Pennsylvania Institute for Instructional Coaching and the Penn Literacy Network. She brings extensive experience in delivering professional development to support teachers in integrating technology to support teaching and learning.

ABSTRACT

The Doceo Center for Innovation + Learning, part of University of Idaho's College of Education, is funded by the JA and Kathryn Albertson Foundation. Our purpose is to assist K-12 schools, higher ed faculty, and future teachers with purposeful and successful implementation of technology. The Doceo Center offers a full range of professional development opportunities for K-12 schools and conducts research surrounding technology integration to benefit K-12 schools in making technology decisions. The purpose of this session is to explain the Doceo Center's Tech GEARS framework and to share professional development opportunities offered through the center. Tech GEARS provides a robust framework for evaluating technologies in educational settings to provide teachers, technology coordinators, and administrators with insight into key aspects of any technology's usefulness and feasibility in educational settings. Stakeholders may have different values that lead them to judge technologies differently. Thus, Tech GEARS is based on the identification of four key values essential for properly determining any technology's applicability in educational contexts: Compatibility, relative advantage, scalability, and sustainability. The goal

of the Tech GEARS framework can assist school districts in simplifying the complex task of decisions regarding technology purchases. Professional development offered through the Doceo Center is concerned with purposeful technology integration through the lens of the Universal Design for Learning with an emphasis on supporting both the Idaho Core Standards and the Danielson Framework for Teaching. Professional development opportunities are diverse with multiple summer institutes, K-12 conferences and workshops, and professional development for individual teachers and schools. Prior to presenting professional development at your school, we help to evaluate your needs concerning tech integration and create a program that caters to your school's unique situation.

North Star:

Going Beyond the Hour of Code

- **Heidi Pluska** has over 15 years of experience as an educator and currently teaches at Timberline High in Boise. She has taught chemistry, AP chemistry, and has led the implementation of many computer science camps for grades K-8. Pluska is currently the Code.org affiliate for the state of Idaho. In this capacity, she conducts teacher trainings throughout the state on how to effectively integrate computer science in the elementary grades. Pluska is currently pursuing her doctorate in curriculum and instruction with a computer science emphasis at Boise State University. She is also actively involved in the Idaho Technology Council's CS in K-12 initiative.

ABSTRACT

Our nation's current trajectory points to a lasting digital era, and more than ever Idaho needs people who can think like software engineers and network architects, whether they are developing computer chips, stream lining agricultural production in our state, or solving resource distribution issues in a third world country. In this session, participants will experience Code.org's K-5 curriculum. This curriculum expands upon the popular Hour of Code and helps foster the problem solving skills that kids will need to take on future challenges. Additionally, participants will learn how their schools and districts can partner with Code.org to deliver computer science opportunities at the secondary levels. The technologically challenged are encouraged to attend. In this session you will discover that computer science is fun, engaging, and accessible to everyone.

Session V– 3:00 - 3:30 p.m.

Aspen:

Sneak Peek at Discover Technology's Mobile STEM Lab

- **Chad Houck** was initially the program director and now is director of operations for Discover Technology. Houck has spent the last three years helping to develop and grow the Discover Technology program in Southwest Idaho. He is an avid public speaker and presenter, and has led discussions and served on panels for multiple STEM forums in Idaho. He is an accomplished project manager, having completed several innovative projects in learning environments and immersive user experiences, not the least of which is the creation of the Discover Technology/Micron 60' STEM Mobile Discovery Lab. Houck is a graduate of the University of Montana with a degree in business management and marketing.

ABSTRACT

Discover Technology's innovative "mobile discovery lab" approach to exposing students to the excitement of STEM will be on full display at the Discovery Center of Idaho this evening; however, for those who are unable to make the evening event, this is your chance to see it for yourself. Operating from a re-engineered 60' articulated metro bus, Discover Technology has reached over 30,000 students in both rural and non-rural settings. A day with Discover Technology gives students and educators the opportunity to experience UAVs, robotics, 3-D printers and other innovative tech first-hand, fueling the desire to learn more. Session attendees will be invited to experience the Mobile Lab for hands-on time, and will also have open Q & A time with lab facilitators and Discover Technology's Director of Operations, Chad Houck.

Cinnabar:

“Throw and Catch Pebbles” Mathematical Game

- **Jacqueline (Jackie) Maximillian**, Ph.D. A post doctoral fellow with environmental science, University of Idaho, Maximillian has been involved in STEM education for the past three years. Maximillian worked on the project to introduce math and science concepts to Hispanic children in Jerome. Her research interest focuses on improving participation of minorities and underrepresented populations in STEM by increasing accessibility of STEM knowledge and learning materials; broadening teachers’ abilities to teach students with diverse backgrounds; and, increasing minority parents’ involvement in their children’s education.
- **Ivan Mucyo Ngabo** is a first-year chemical engineering student at University of Idaho. He is interested in relatable and cost-effective programs of improving STEM education in Idaho, particularly among minorities.

ABSTRACT

We will present a “new” cost-effective mathematical game that can be played in and outside of the classroom to improve students’ mathematical proficiency and mathematical education. Education scholars indicate that students consider math to be unexciting and difficult, despite the fact that it is an important component of everyone’s knowledge base. Therefore, this game is part of the efforts to reverse the negative perception towards mathematics by students’ mentality so that they view mathematics based concepts as more exciting and engaging. A quote from George M. Phillips, “Mathematics is not a spectator sport,” meaning students need to be in the center of the action. This is the essence of this game. In general, it is part of the state and national efforts to improve STEM education.

“Throw and catch pebble” is an indigenous math game that has been played by children in Africa for centuries. This game teaches children math concepts such as conservation, multiplication, addition, counting, and estimation. In addition, students learn the following skills: strategic thinking, multitasking, and coordinating. Further, students are familiarized with physics concepts that have to do with motion (e.g. Newton’s laws). This math game requires two types of items, and one of them is obtained from nature. Thus, the game is not cost prohibitive and is particularly appealing for tight budgets.

Liberty:

Exploring Intersections: A Unique, New Partnership-in-Progress

- **Kristine Barney** is the executive director at the Discovery Center of Idaho. She joined the Discovery Center in 2013 from Boise State University where she worked for over eight years on STEM education and student success initiatives. While at Boise State, Barney held various leadership roles in the College of Arts and Sciences and at the university level and contributed to multiple externally funded projects. Prior to her work in higher education, Barney was a researcher in cell and molecular biology labs at Loyola University Medical Center in Chicago and J.R. Simplot Company in Boise. She holds undergraduate and master’s degrees in biology and her graduate research focused on innovations in teaching and learning in science.
- **Jim Fredricksen** is an associate professor of English education and co-director of the Boise State Writing Project at Boise State University. In his work at Boise State, Fredricksen instructs and advises pre-service teachers and provides mentoring and professional development to in-service teachers. He earned his doctorate in curriculum, teaching, and educational policy at Michigan State University. Prior to his time at MSU, Fredricksen taught seventh and eighth grade English language arts students in St. Charles, Illinois and in Fairfield, Ohio. He is the author of numerous books and articles on writing, teaching, and learning.

ABSTRACT

How the program got started: Our project is funded by an NSF grant awarded to the National Writing Project (NWP) and the Association of Science-Technology Centers (ASTC). The Boise State Writing Project and Discovery Center of Idaho’s partnership grant (a sub-award through the national partners) is one of only ten in the nation.

What it offers to conference participants: Our project and presentation explore intersections between science and literacy, formal and informal education, adults and teens, our organizations' shared values, fun and work, and old and new (hacking). This week we are co-hosting a week-long institute at the Discovery Center for a group of teachers and teens. Together, as learners, our institute participants are "hacking" spaces, exhibits, and programs to make them more useful for the community. In our presentation, we will share how this institute embodies our shared goals of promoting inquiry, fostering leadership, and building communities of learners. Warning: we will not be talking at you the whole time... participants will be invited to engage in active, hands-on learning.

What it contributes to STEM education in Idaho: We see this experimental institute and emerging partnership as models for other higher education, K-12, and non-profit partners interested in building community and encouraging inquiry into important STEM issues.

North Star:

STEM Fun in the Sun: Using Summer Science Camps as Professional Development

• **Amy Christopherson**, director of the CSI Mini-Cassia Center, adjunct biology and education instructor, and "Science Mom" to her kids and their classrooms. Christopherson has a passion for making science fun and accessible for kids of all ages. She has learned that when we allow children to make "discoveries with support", they realize science, math, and technology are interesting. With her college students, young and old, Christopherson helps them see that scientific concepts are best understood when we apply those concepts to their daily lives and the decisions they need to make for their families. She believes parents play a critical role in the academic success of their kids. Christopherson borrows her teaching motto from Rachel Carson: "If a child is to keep alive his inborn sense of wonder, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement, and mystery of the world we live in."

ABSTRACT

Beginning in 2009, the College of Southern Idaho began an experiment with their summer science camp at the Twin Falls location, as well as the Mini-Cassia Center in Burley, Idaho. We partnered with local K-12 teachers to deliver a week-long experience for kids grades K-7. We are busy preparing for our seventh year using this model, and we believe it continues to serve the needs for both teachers and students in the Magic Valley.

Each year, we develop a STEM theme that has a direct correlation to content that is relevant to district teachers. We have spent time teaching photosynthesis, anatomy, engineering, inventions, space, and more. One of the benefits that is built into this model is the training that occurs before camp week. Teachers are introduced to resources, experts, and learning materials in the subject area so that they have new ideas for their own classrooms, as well as for the campers.

The partnerships that exist include the CSI Community Education department, which coordinates the logistics, registration, and materials for camp. In addition, we work with NNU which provides the PD class and credit for the participating teachers. This past summer, and scheduled again for camp 2015, the Mini-Cassia Center Science Camp will partner with University of Idaho Extension/4H office to include a Junior Camp for Pre-K and Kindergarten ages. We have also received support from the CSI Herrett Center, City of Burley Fire Department, ISU's Physics Department, and the Magic Valley Astronomical Society.

The CSI Science Camp works to promote STEM in Idaho by establishing relationships between higher education faculty and K-12 teachers. The students benefit by having a valuable, informal experience with teachers they may be familiar with from school. We look forward to another great year of CSI Science Camp, "Full STEAM Ahead!"

Session VI - 3:45 - 4:45 p.m.

Aspen:

University of Idaho College of Natural Resources McCall Outdoor Science School

- **Mark Beaver** – MOSS. An Idaho native, Beaver holds a bachelor's in secondary education – social science from the University of Idaho and a master's in natural resources – conservation social science through the UI College of Natural Resources MOSS program. He has taught and coordinated place-based environmental education programs with various organizations throughout Idaho including Sawtooth Interpretive and Historical Association of Stanley, Foothills Learning Center of Boise, and the Environmental Resource Center of Ketchum. Currently, Beaver works to make MOSS a sustainable and functional campus as maintenance coordinator and designs avalanche and snow-science based curriculum and programs as the McCall Winter Sports Club - Big Mountain program director.

ABSTRACT

The University of Idaho College of Natural Resources' McCall Outdoor Science School (MOSS) is located on the McCall Field Campus and borders Payette Lake and Ponderosa State Park. As Idaho's only publicly operated K-12 outdoor school, MOSS offers a one-of-a-kind learning experience for Idaho youth, graduate students, teachers, and the local community.

Think of it as the ultimate field trip. Classes are conducted in a coniferous forest, on the shore of a lake, and in a meadow. The most useful tools for learning are readily available; the students' five senses. The subject of ecosystem science serves as the context for standards-based study of science, technology, mathematics, and language arts. Operating in the fall, winter, and spring these 4-5 day programs provide an unforgettable learning experience for middle and high school grade public, private, charter, and homeschool students. We can customize our programs to meet your specific academic or social development goals.

Students typically learn in small teams and are taught by University of Idaho graduate students. Each day, teams of 8-10 students accompany their instructors to field sites to field investigations leading to the develop of their own inquiry projects which they present to their classmates, teachers, and parents at the end of the week. The 5 "Cs" - communication, collaboration, caring, connection, and cooperation - are reinforced during the entire week, in the field, while sharing chores, and in small group living. Team-building and mutual respect are important components of our field programs. New life skills in communication and group decision-making are the result when students participate in a series of low-ropes elements. Clear communication, respect (for ourselves and others), and teamwork are stressed. Low instructor-student ratios allow us to give abundant individualized attention.

Cinnabar:

The Children (and their Technology) Are Our Future

- **Brooke Lacey** caught the technology bug in her late teens when a new computer (Windows 3.1x!) was brought into her workplace. She has continued to work in the technology field for more than twenty years in software design, teaching, and then in 2013 to starting her own business, Tech Savvy. Focusing on computer repair and IT services, Tech Savvy has grown over 300% from its small beginnings fourteen months ago and provides service to the Treasure Valley and surrounding areas. Tech Savvy is the only woman-owned and operated computer repair business in the Boise area. Lacey is a member of the BBB and Chamber of Commerce. She volunteers with the Discovery Center of Idaho and the Micron Foundation in its Women in Tech Careers program.

ABSTRACT

Kids today are immersed in technology at a young age, yet they rarely understand how everything works on the base level and which careers make that technology possible. Idaho youth, especially girls who are traditionally underrepresented in technology fields, can be encouraged to study technology with a few nudges that make them aware of how fun tech can be on the build level.

Attendees will learn how to use discarded hardware to pique students' interests in tech fields. We will also discuss various education partners including Micron Foundation and Girl Build It (an extension of Girl Develop It) as well as how and when to engage with them. When kids learn that tech is not some big scary job done by guys in a dark room who never see the sun they begin to reach out and ask for tech related opportunities – we can help with that. Lastly, I will talk about how educators can engage community educational partners, small businesses like mine, to bring real-world knowledge and expertise to their students.

Liberty:

The Boise WaterShed: A Community Collaboration Project

- **Jan Smith** is a master teacher for the IDoTeach program at Boise State. In this position, Smith helps prepare future secondary education STEM students for successful teaching careers. Smith's prior experience includes over 20 years as an elementary school teacher. Smith is currently finishing her doctorate through Boise State with a focus on improving STEM education, specifically for elementary teachers and their students. Smith has lived in the Treasure Valley for over 20 years.
- **Cindy Busche** is the environmental education coordinator at the Boise WaterShed Education Center where she develops and teaches programs about water protection and water conservation. Her employment with Boise City Public Works began more than seven years ago with the Stormwater program, in which she coordinated education programs and occasionally moonlighted as Eddy Trout. Prior to working with the City of Boise, she developed and taught STEM programs in Los Angeles. She's thrilled that her journey brought her to Boise to share her love of the environment with the next generation of Idahoans.
- **Eian Harm** is the Research and Special Projects Coordinator for the West Ada School District in Idaho. His prior work has been both as a hydrogeologist and secondary science teacher. Harm's current focus is upon defining effective digital teaching practice, personalized learning, and projects in conjunction with Digital Promise- The League of Innovative Schools.

ABSTRACT

Through generous funding from the Micron Foundation, a unique collaboration has proven to be successful in more ways than one. Almost 3,000 second grade students from the West Ada School District will visit the Boise WaterShed to learn about weather and water protection this spring. This has been a tradition in the district for several years now, but this year the program has included an additional collaborator; Boise State University. Students from the IDoTeach program, who are studying to be STEM educators, have been hired to work at the Boise WaterShed, thanks to additional funding from Micron. The IDoTeach students have helped develop hands on learning experiences for the second graders, and are given opportunities to teach during the field trips. Two forms of data are being collected with this project to investigate the impact of this collaboration on several partners. First, we want to investigate how this experience impacts second graders knowledge of STEM careers, and their resulting interest in STEM careers. We are currently collecting data from pre and post surveys, and initial results are promising. We will also be interviewing the IDoTeach students to find out what impact this experience has had on their pre-service teaching experience and their choice to be STEM educators.

North Star:

Using Scratch to Increase Digital Literacies and Promote Technological Careers

- **Terence Soule** is a professor of computer science at the University of Idaho. He received a bachelor's in physics in 1991, a master's in physics in 1994, and a doctorate in computer science in 1998. He is extremely active in education. He helped redesign the University of Idaho's introductory programming course, including writing a textbook (A Project Based Introduction to C++, KendallHunt, ISBN: 9781465260468) to support the new course design. He also helped design a new computer science course for non-majors and for students with weak computing backgrounds who want to enter CS. For the past several summers he has been teaching week-long coding camps for middle and high school students and is active in other outreach and education activities, including activities with Girl Scouts, 4H, and local elementary schools.

ABSTRACT

Recent surveys have shown that Idaho students' interest in jobs in STEM fields, including engineering and technology; while initially high, decline dramatically between seventh and tenth grades. Girls' positive attitudes toward mathematics and science

and their interest in careers involving mathematics and science decreased drastically as well. Overall the reports show that girls' attitudes "diminished at a far more substantial rate than for boys," highlighting the need to focus on girls and STEM disciplines. The Digital Innovation Generating New Information Technology (Dig'n IT <http://www.uidaho.edu/cda/extension-outreach/dignit>) program is a multi-part project aimed at increasing digital literacies and promoting technological careers for all Idaho students with an emphasis on middle and high school girls. One of the key elements of the program is the use of Scratch (<https://scratch.mit.edu/>) – a programming environment designed to help introduce younger students to programming.

This session will discuss the use of Scratch as a tool for increasing interest in technology, including programming, math, and science. With specific discussion based on experiences from the middle school and high school components of the Dig'n IT program. We'll discuss how the programs and exercises were structured to promote both excitement and learning for the participants and discuss lessons learned from the programs. Audience members will engage in the presentation by viewing some of the coding projects and by participating in a discussion about the project. Participants can follow along by creating their own Scratch account at scratch.mit.edu.

Special thanks to Julie Amador, Curriculum & Instruction, University of Idaho, who co-led this project.

Session VII - 4:15-4:45 p.m.

Aspen:

Invent Idaho: Inspire! Ignite! Invent!

• **Scarlett Randall** is currently the southwestern regional coordinator for Invent Idaho and has had numerous young inventors place at the state competition level. Randall is in her 27th year of teaching and is currently teaching a self-contained 1st/2nd grade gifted classroom in the Boise Independent School District. She facilitates professional development trainings, leads book studies, models differentiated instructional strategies and Project Based Learning. She has a masters of education (M.Ed.) from Lesley University and a gifted education endorsement from the State of Idaho. She has taught in Title I schools and is well-versed in the varying needs of low-income gifted and twice exceptional (2e) students. She is a recipient of the GEM Award given by ITAG/SAGE (Idaho: The Association for the Gifted). Her passion lies in promoting the areas of science and mathematics.

ABSTRACT

Invent Idaho is the premier student invention program in the Northwest, having provided a forum for thousands of young inventors in grades 1-8 since its inception in 1989. Invent Idaho is the only program in Idaho that celebrates student creativity and innovation, while teaching the inventive thinking process in an interdisciplinary curriculum. Young inventors participate in progressive levels of competitions, including three Regional events held across Idaho, culminating in an Invent Idaho State Finals event.

Invent Idaho provides numerous benefits to schools and students alike by addressing STEM goals for 21st century skills and meeting State Standards in Science, Technology, and Engineering. In addition, the Invent Idaho interdisciplinary and cross-curricular activities encourage higher order thinking, real-world problem solving.

As one long-time Invent Idaho parent stated, "Invent Idaho has been a wonderful creative outlet for my kids. It has taught them critical thinking skills and problem solving skills. They would be creatively engaged for hours while trying to get their ideas on paper and making models. What a great way to combine science, math, research, development, marketing, writing, and model making into an exciting learning experience."

Participants will be inspired to ignite the inventive spirit in their own students by implementing the Invent Idaho program in their classroom, school, or district.

Cinnabar:

IDLA is More than Courses

- **Sherawn Reberry** is the director of education programs at Idaho Digital Learning. IDLA provides eLearning expertise, virtual services and leadership in collaboration with Idaho educators to meet Idaho student needs. Prior to IDLA, Reberry has experience as a principal and assistant superintendent. Reberry received her doctorate in education in 2002, educational leadership, emphasis in instructional technology. Her dissertation, titled “Teaching with Technology: Professional Development Opportunity for Teachers,” looked at how professional development affects teachers and the use of technology in their classrooms.
- **Niki Walker** is currently the Idaho Digital Learning Blended Learning Program Manager. She has been an educator for 13 years and worked in all aspects of education. Walker has taught in the classroom, developed and taught online and blended learning courses as well as provided professional development for teachers in all aspects of education. Walker has her Masters in Curriculum and Instruction: Instructional Technology and her expertise spans the education field while providing practical knowledge in traditional, blended, and online learning.

ABSTRACT

The term online learning creates a myriad of ideas. Idaho Digital Learning can share in these definitions. During this session you will learn how one district uses the IDLA Blended Learning program to prepare and guide 9-12 grades in developing a STEAM project. Multiple teachers work together to guide and assess students along the 4 year process. Additionally, IDLA will provide information on how IDLA is more than courses and what that means for your school and district.

Liberty:

Think Through Math

- **Marisa Alan** is the Think Through Math (TTM) state director of Implementation for Idaho and Utah and has been part of the Idaho TTM team for almost eight years. Prior to this job she was a classroom teacher for 15 years.

ABSTRACT

Think Through Math was originally purchased by the State Department of Education in 2008 as an intervention for students in grades 5-8 and has grown to include optional use by all students in Idaho in grades 3-Geometry. TTM offers credit recovery options for algebra and geometry as well as a state approved Alternate Route to Graduation.

TTM’s emphasis is on problem solving and was built to support the CCSS practice and content standards and provides students opportunities to practice next generation problem types. TTM can be used at school or at home to help students keep up, catch up, or get ahead in CCSS based math problem solving. Offering a built in motivation system and live, certified one-on-one math instruction, TTM gives teachers an easy way to differentiate instruction during whole class or small group lessons.

TTM employs three full time Idaho-based Instructional Coaches who work to disseminate information to administrators and teachers, provide onsite and online PD, and work directly with students in the classroom to coach teachers and students on effective use of TTM in the school setting.

Think Through Math is currently being utilized by over 30,000 Idaho students at teachers’ discretion and is available for use for every student in Idaho in grades 3-Geometry as an at-home or at-school resource.

North Star:

Idaho Career Information System: Fostering STEM Career Awareness

• **Sara Scudder** - Currently the administrator of the Idaho Career Information System in the Idaho Department of Labor, Scudder previously supervised the department's web delivery team, where she was responsible for planning, production and delivery of outreach content and materials for the web, print and social media. Prior to that she supervised occupational employment statistics and special research projects including a \$1.25 million federal economic stimulus grant to improve labor market information and the 2011 Idaho Nursing Overview assessing education capacity, salary and recruitment issues. Before joining the department, Scudder was associate study director for Clearwater Research. An academic All American collegiate swimmer, Scudder is a summa cum laude graduate of Auburn University in political science and has a master's in economics from California State University, Hayward.

ABSTRACT

What do you picture yourself doing in the future? You may want to help sick people get better or save the planet. Maybe you want to make new discoveries, solve mysteries, help build the future or create tools to make many, or all, of these things happen. Whether you know it or not, you're interested in a STEM career. You may be familiar with "core" STEM careers like those in life and physical science, engineering, mathematics, information technology and social science. But did you know STEM careers can also be found in architecture, health, sales, education and managerial occupations?

Use the Idaho Career Information System (CIS) to find out more about STEM careers. CIS is Idaho's Internet-based, comprehensive guidance system. It is a proactive and participatory resource for engaging in life and career planning. CIS is appropriate for middle schools, high schools, postsecondary institutions and agencies serving adult populations such as employment offices, vocational rehabilitation programs and correctional facilities. CIS provides Idaho and national career workforce and educational information in a user-friendly format. The information and exploration tools contained in the CIS system are designed to help Idahoans make informed career choices and seek the qualifications necessary to be successful in the workplace.