The STEMx Network™ is dedicated to the advancement of STEM education on a national level. In its most simple form, STEMx is a network of networks. While each state has its own objectives and deliverables, through STEMx we can build on the strengths of each state to turn the promise of STEM education into real impact.

Across all 19 members, we concentrate on three areas.

1) Policy – where we work to advocate for state and federal policies that advance STEM.

2) Practice – where we seek the best in new STEM educational innovations.

3) Partnerships – where we look to find other major organizations who we can work with to advance STEM nationally.

This report is meant to be a resource to give you a small window into the expertise of each member of STEMx, especially around these three areas. To learn more about each organization and find links to contact individual members, visit our website: www.stemx.us.

Michael Feder,  
Director of STEMx  
federm@battelle.org
2015: New members, new opportunities, and ways to work together

As we head into 2016, it’s worth recognizing what we accomplished this past year. We welcomed Florida and Maryland as the newest members of STEMx. Battelle will lead a $185 million, 10-year project to manage the Army Educational Outreach Program, which will connect STEMx to Army programs along with other national organizations like the National Association of Science Teachers, Technology Student Association, the Academy of Applied Sciences, and more.

And we’ve started new ways for you, and others in your state, to gain useful information. Whether it’s the monthly webinars you can share with others in your state or STEMx Scoop, our newsletter, we’re publishing more than ever.

What’s next? A strong focus on our committees around policy, practice, funding, and communication.

STEMX™

INCLUDING
Washington D.C.
Guam
The Arizona STEM Network, led by Science Foundation Arizona, is a collaboration between businesses, educators, government and philanthropy with a common agenda to graduate more Arizona students prepared for the global economy through STEM education. The Arizona STEM Network enjoys support from Arizona’s former and current Governor, large corporations, CEO organizations and philanthropies.

FACTS

• 45% of 8th graders are interested in STEM careers
• Science Foundation Arizona built an online platform to connect STEM advocates that has more than 1,000 members and more than 400 open-source resources for teachers
• The foundation has also published a STEM Immersion Guide for schools implementing STEM and another guide for STEM Clubs

PROFILES

Ken Quatermain, Network Director, Arizona STEM Network
For the past six years Ken has been the government affairs lobbyist for Public Policy Partners which represents the Arizona Technology Council and its member companies from aerospace & defense, aviation, health & bioscience, semi-conductor & electronics, information technologies, energy, cyber-security, telecommunications and optics. Over this time Ken has been responsible for the creation and expansion of tax policy, capital formation and economic development initiatives.

Linda Coyle, Director of Education, Arizona STEM Network
Linda Coyle is an experienced award winning educator and STEM Education Consultant with Exploring STEM, LLC. Her background spans a 34-year career in K-12 and Higher Education. Ms. Coyle has had a tremendous impact on the integration and advancement of STEM education in Arizona and has been instrumental in the collaborative development of the Arizona STEM Network online community and the definitive guides on STEM education used in Arizona and being adopted in other states.
The California STEM Learning Network (CSLNet) has joined a fellow non-profit, Children Now. Children Now is a non-partisan research, policy development, and advocacy organization dedicated to improving children’s overall well-being. The partnership between the organizations combines CSLNet’s expertise in STEM networks with the broad advocacy platform that Children Now has built since the organization was founded in 1988.

**FACTS**
- 67% of California voters favor the use of Common Core State Standards in California schools.
- By 2020, the demand in California for employees in STEM jobs is projected to be roughly 1 million.

**PROFILES**

**Chris Roe, President and Chief Executive Officer, CSLNet**

Chris is in charge of overseeing the creation of strategic relationships and collaborating with regional, state and national partners to rapidly scale innovative STEM teaching and learning across PK-14 education.

Prior to joining CSLNet, Chris served as the Deputy Director for the Business-Higher Education Forum, a membership organization comprised of corporate CEOs and senior executives, college and university presidents, and foundation leaders working together to advance innovative solutions to the nation’s most significant education challenges.

**Ted Lempert, President, Children Now**

In addition, to his role at Children Now, Ted is also a Lecturer in the Political Science Department at UC Berkeley. Previously, he was the founding CEO and co-founder of EdVoice, a California education reform organization.

Ted was a California State Assembly member representing San Mateo and Santa Clara Counties from 1996 to 2000 and 1988 to 1992. He served as chair of the Assembly Higher Education Committee and the Select Committees on Education Technology and Coastal Protection, and co-chair of the Joint Committee to Develop a Master Plan for Education. He had more than 75 bills signed by Governors Deukmejian, Wilson and Davis, including major laws in the areas of education, health care, children and families, tax policy and the environment.
XSci is the Experiential Science Education Research Collaborative at CU Boulder. They create and research experiential programs; experiential science learning is about personal close encounters with the content, processes, and emotions of science. It is a philosophy that emphasizes learning from direct first-person experience and a holistic perspective that includes the self-construction of knowledge as well as emotions, attitudes, and beliefs that combine to form a learner’s “science identity.” XSci is housed within the Center for STEM Learning with the mission of advancing K-20 STEM education by transforming the way we teach, discover, and share knowledge, with an emphasis on STEM.

FACTS

• Colorado’s STEM education effort includes a diverse collaboration of higher education, K-12 schools, corporations, non-profits, informal education organizations, foundations, government agencies, and entrepreneurs across urban and rural areas.

• Colorado University’s Center for STEM Learning integrates more than 75 K-20 oriented programs and projects in STEM education, representing tens of millions of dollars in grants at CU-Boulder.

• XSci at the Center for STEM Learning in Colorado is a leader in experiential STEM education, with strong ties to national and international programs such as The Jane Goodall Institute, Roots & Shoots, NCWIT, and Bayer’s international Teens programs.

PROFILES

Dr. Bradley McLain, Co-Director, XSci

Brad McLain is a social scientist and co-directs the Experiential Science Education Research Collaborative (XSci) at CU Boulder. Dr. McLain’s research focuses on identity development in relation to STEM learning and career pathways, including the nature and impacts of extraordinary experiences and how such experiences may change our sense of self and life trajectories at different ages. One of the recent projects XSci launched is STEMLink which connects STEM educators to industry professionals for professional development, mentorship, and other learning opportunities. Additionally, XSi has just been named the research lead on a project with SciGirls and Latina SciGirls studying STEM identity in girls and latina girls.

Angela Baber, Director in STEM, Colorado Education Initiative

Angela Baber joined the Colorado Education Initiative (CEI) in 2012 as a director in STEM. She collaborates with the Governor’s office, the Colorado Department of Education, the Colorado Department of Higher Education, and many other state and corporate organizations to advance a statewide STEM agenda. This partnership focuses on closing the opportunity gap through equity and excellence in STEM education so that all students are prepared with the skills they need to succeed in college, career, and life. Under Angela’s leadership in the last three years, Colorado stakeholders came together to create the STEM Education Roadmap. The roadmap prescribes ways for education (formal and informal) and industry to help guide Colorado to their goal of leading the nation in STEM talent development.
THE DC STEM Network was launched in October 2014 by the District Office of the State Superintendent of Education (OSSE) and the Carnegie Academy for Science Education (CASE) of Carnegie Institution for Science. Since launching, the Network has engaged over 250 stakeholders to assess the STEM needs in Washington, D.C. The stakeholders completed landscape surveys to help the Network plan for the coming years and to prioritize their work. The Network launched seven working groups around key areas of work, including out of school providers, work based learning, teacher professional development, and mentors and volunteers. With deep commitment from a wide variety of community partners, the Network’s goal is to prepare all students to graduate with a college and career mastery of STEM and increase the number of students majoring and working in STEM fields.

FACTS

• There will be 94,000 STEM related job vacancies to fill in the District of Columbia by the year 2018.
• In 2015, the Network engaged over 250 stakeholders to evaluate the state of the District’s STEM learning ecosystem through digital surveys.
• The District of Columbia has established 12 NAF Academies aligned with priority career sectors in Engineering, IT, Health and Medical Sciences, and Construction.

PROFILES

Dr. Julie Edmonds, Director, DC STEM Network

As Director of the DC STEM Network, Dr. Julie Edmonds oversees partnership building, working groups, and Network programs. A former research scientist, Julie has designed and instructed intensive STEM programs for students and teachers in DC in both formal and informal settings. The work of the Network to date has very intentionally involved members of the community - listening to them and working with them to create an engaging and successful network. Four landscape studies conducted by the Network detailed efforts in schools, with mentors and volunteers, around professional development, and during out-of-school time. These surveys helped the network focus their work on areas that need the most attention first - including connecting schools to mentors and volunteers, serving as a link for professional development opportunities to public charter schools, and creating a map of out-of-school STEM providers. They plan on surveying the community on a regular basis to ensure that future projects align to community needs.

Maya Garcia, STEM Director, OSSE

Maya Garcia serves as the STEM Director for OSSE, playing an instrumental role in the development of the district’s STEM Plan and launch of the DC STEM Network. A science teacher for over nine years, Maya also oversees the district’s implementation of Next Generation Science Standards. With a population of over 70% of students on free or reduced lunch and 30% in special education, about increasing the number of underrepresented groups in STEM is the forefront of all of the Network’s discussions. The Network is building a STEM Teacher Leader Cadre to serve as teacher leaders in their own school, support implementation of NGSS, and serve as STEM Ambassadors. These teachers represented public and charter schools and participated in professional development sessions around NGSS and STEM over the summer and during the school year to build their leadership and knowledge around the new standards and the Network.
The Northeast Florida STEM² Hub is a business-driven nonprofit devoted to growing STEM employment in their region. They convene, inspire, and invest in STEM fields by providing the essential missing elements to accelerate the growth of STEM education and careers. The organization has ambitious goals to increase the STEM workforce, number of STEM degrees, and improve math test scores in the coming years. With a strong commitment from local leaders, STEM² Hub is on the path to improve STEM outcomes in their region.

**FACTS**

- STEM² Hub convenes, inspires, and invests in STEM fields by providing the essential missing elements to accelerate the growth of STEM education and careers.
- 19% of Northeast Florida workers are in STEM occupations compared to as many as 33.2% in other larger metropolitan regions. In addition, Jacksonville ranks 80th out of 100 top STEM metro areas.
- STEM² Hub introduced three after-school STEM² clubs: FIRST Robotics, MATHCOUNTS, Science Olympiad, and computer science.

**PROFILES**

**Wanyonyi J. Kendrick, Start-Up Executive Director, Northeast Florida Regional STEM² Hub.**

Wanyoni Kendrick comes to STEM² Hub after 25 years in the technology industry. As start-up executive director, she spearheads programs and partnerships in Northeast Florida. The STEM² Hub has identified a measurable, balanced, and attainable set of priorities. These priorities are: increasing the number of early college high schools and STEM² after-school clubs in the region, creating a vibrant start-up community, and establishing a technology on-shoring entity. She also led the development of a scorecard to measure their success based on workforce, higher education, and K-12 schools. Each area of focus has at least four metrics, with one being the primary metric. For workforce, the goal is to increase the engaged STEM workforce to 9,000 (or 11%) of workers in the next 18 months. For higher education, it is to increase the number of STEM degrees (associate’s and bachelor’s) awarded in the region. In K-12 schools, the STEM² Hub is focused on math achievement looking at end of course test scores; additionally, the STEM² Hub has set a goal to have after-school STEM clubs in every school in the region. By creating clear goals, Kendrick continues to build and maintain support of the community and hopes to bring the same innovations across Florida.

**Gary Chartrand, Executive Chairman, Acosta**

Gary Chartrand founded the STEM² Hub and currently serves as its chairman. Mr. Chartrand has a passion for educating the children of Duval County; helping bring Teach for America to the community in 2007 and supporting KIPP schools of Jacksonville. Because of his passion for education coupled with his business experience and leadership Governor Rick Scott appointed Chartrand to the State Board of Education in 2011. He chaired the board for two years. Through his work, Chartrand helps organize and collaborate with the business and education communities in Northeast Florida. With employers needing more STEM employees and wanting an entry point into the school system to help improve education, the STEM² Hub provides an essential mechanism to accelerate the growth of STEM education and careers in the region. Chartrand believes computer science puts students on the path toward some of the highest-paying, fastest-growing jobs in America. Chartrand is extremely excited about the STEM² Hub’s partnership with regional Northeast Florida school superintendents and CODE.org to bring this nationally recognized best practice computing curriculum to the region.
In 2014, the Guam Department of Education (GDOE) began a strategic planning process to drive STEM literacy for the next generation of Guam’s students. This effort is an important part of their mission of achieving excellence for every student. The demands of today’s and tomorrow’s workforce means that they must provide all students with STEM skills so that they are prepared to successfully follow both local and global career pathways. Guam’s STEM vision and goals define the measure of success they expect to achieve. Their work is focused on implementing the strategic plan, teacher professional development, Project Lead the Way, and a STEM expo.

**FACTS**

- The STEM Strategic Plan took the GDOE one year to complete and provides the direction for the department from the K-12 level to push forward the STEM initiatives.
- Guam has a diverse population. In addition to Guam’s indigenous Chamorro people, who comprise approximately 47% of the population, large numbers of mainland Americans, Filipino, Chinese, Japanese, and South Koreans constitute the majority of Guam's population.
- There are 62,480 jobs on Guam, representing a slight increase from 61,910 jobs a year earlier; with about 18% in STEM related fields such as Construction (15%), Manufacturing (3%), Transportation and Public Utilities (<1%), and Agriculture (<1%).
- A survey of over 100 employers in Guam found a high need for STEM skills, especially in engineering (69% of employers), and technology (58% of employers). Many employers were also seeking workers with a strong background in math (40%) and science (31%).

**PROFILES**

Dr. Leah Beth O. Naholowaa is the Project Director for College Pathways Program at the Curriculum and Instructional Improvement in the Guam Department of Education. As a project director she’s in charge of implementing STEM, Advanced Placement, Dual Enrollment, Online Learning, and Robotics and Technology programs. Leah Beth has worked in the education field for more than two decades, serving as adjunct faculty at the University of Guam. She has coordinated career fairs and workshops specializing in careers, resume building, and job searches. Leah Beth has organized professional development workshop trainings, prepared institutional reports, and works closely with teachers to ensure that students are given the proper material to further their learning in programs such as STEM, Advanced Placement, and Online Learning.
i-STEM is a collaborative effort of Idaho state government, educators, business, and industry to support STEM education in Idaho schools. Established in 2009, i-STEM has launched six STEM centers across the state providing a regional hub for STEM resources, including teacher professional development and connections to local industry and business. Working with many partners, including industry and state government, the Idaho State Legislature approved the new Idaho STEM Action Center this year. Housed in the Office of the Governor, the Action Center will work to unite the state and keep students in the STEM pipeline.

FACTS

• The Idaho STEM Action Center was recently launched through legislative support of the Governor’s office, multiple state agencies, and industry.

• Through the six STEM centers across Idaho, more than 4,000 educators and school administrators have participated in i-STEM summer institutes and been trained in integrated STEM techniques since 2010. The centers and institutes have been replicated in Alaska, Wyoming, and Utah.

• The innovative research base of i-STEM is recognized regionally, nationally, and internationally with over 13 research publications and more than 12 STEM tools and instruments available to support integrated STEM education.

PROFILES

Anne Seifert, Executive Director, i-STEM
As Executive Director of i-STEM, Anne Siefert leads a collaborative effort with government, higher education institutions, educators, and industry to help keep the six regional STEM centers running to provide high-quality professional development opportunities and STEM resources for teachers across the state. The STEM Centers not only offer STEM resource libraries, place-based instructional resources and connection to STEM experts by also offer i-STEM Summer Institutes designed to enhance teachers’ capacity for STEM teaching and learning and raise their awareness of STEM careers and skill-sets needed to fill the STEM talent pipeline. These thematic-based integrated STEM workshops explore a variety of education topics and issues; through support from the State of Idaho Department of Education and i-STEM partners, teachers receive nearly free STEM curriculum, resource kits, technology devices, continuing education credit, travel, and housing. The work of i-STEM is research-driven with success factors built in - making the trainings and resources provided useful for teachers.

Angela Hemingway, Executive Director, Idaho STEM Action Center
The newly formed STEM Action Center is committed to keeping students in the STEM pipeline and increasing the number pursuing STEM degrees and working in the Idaho STEM workforce. Their first projects are focusing on increasing the number of grant opportunity for educators - both in and out of school - across Idaho. Many STEM opportunities cost more money due to additional resources and materials, by providing grants, Angela hopes to not only spread STEM but to learn more about the STEM landscape in the state. The grants will be rewarded based on innovative ideas and will hopefully grow in years to come. Additionally, the STEM Action Center is investing in a First Robotics Tournament in Idaho; while schools from the state have participated in the past, they’ve had to travel outside of Idaho to participate. By hosting a tournament in-state Angela hopes to see more participation and increased interest.
The I-STEM Resource Network is a partnership of public and private higher education institutions, schools, businesses, and government, hosted by Purdue University. I-STEM was started in 2006 as a collaboration among 18 institutions of higher education in 10 regions throughout Indiana. The organization’s goal is clear: STEM literacy for all students.

FACTS
• In its sixth year, 154 schools participate in the Indiana Science Initiative reaching more than 53,000 kids. Through the initiative, 2,300 teachers trained in new ways of teaching science that closely embed literacy into teaching.
• 9 STEM certified schools in the first year of the Indiana STEM Certified School process.
• The Indiana Afterschool Network has a comprehensive set of STEM standards and recently received a STEM Funders Network STEM Ecosystems grant for connecting STEM education networks in Indiana.

PROFILES

Dr. Paul Ainslie, Managing Director, I-STEM Resource Network
Paul is currently the Managing Director of the I-STEM Resource Network at Purdue University in West Lafayette, Indiana. In this position he manages the Indiana Science Initiative and leads the Indiana STEM Action Coalition. Previously he held several positions at General Motors and Delphi Electronics and Safety in Michigan, Indiana, and California. He has also worked in the biomedical and geophysical industries. Paul has a Bachelor’s degree in Engineering from the University of Michigan, and Masters and Doctoral degrees in Biomedical and Electrical Engineering from Carnegie Mellon University.

Jeremy Eltz, Assistant Director of College and Career Readiness, Indiana Department of Education
Jeremy keeps the STEM work of Indiana’s many partners in line with the State’s priorities. He provides professional development to Indiana’s teachers, including through webinars, and manages a number of major grants including Indiana’s Math Science Partnership grant for $3 million. Jeremy came to the Department after serving as a both a research technician and, later, a teacher. He holds degrees in teaching and biology.
Kentucky P20 Innovation Lab is a partnership between the Kentucky Department of Education, local school districts, University of Kentucky, and higher education institutions across the state. The legislature mandated that there be a PreK through post-secondary education alignment, so many of the connections between schools and local colleges have been in place for years, creating a true partnership between all levels of educators in Kentucky. For the last six years, Kentucky educators have been building capacity as they transitioned to new English Language Arts, Math, and Science standards. Additionally, the Innovation Lab is working to build their STEM Center and finalizing a STEM Performance Guide to help practitioners develop, improve, and grow STEM programs.

FACTS

- In partnership with the Kentucky Valley Education Cooperative, the Innovation Lab won a Race to the Top Grant, with over $200,000 a year going to STEM Education.
- In collaboration with colleges in Kentucky and the Council on Postsecondary Education, the Innovation Lab is designing and supporting a STEM Education Center (Innovate 2 Educate).

PROFILES

**Eve Proffitt**, Director of Education Innovation, Kentucky P20 Innovation Lab

Eve is co-director of Kentucky STEMx and was one of the founders of the statewide network. She works with all the higher education institutions in Kentucky, serving as a program reviewer for college programs for certification, and writing policy. She worked for the Kentucky School Boards Association for ten years. With Kentucky STEMx, she works with education groups in Kentucky as well as the Council on Postsecondary Education, the Kentucky Department of Education, and the Education Professional Standards Board. One of the projects Kentucky STEMx is working on is the STEM Performance Guide. This tool was designed to help anyone creating or growing a STEM program. It shows initial stages of coming together and moves towards full implementation. The tool is focused on the quality of instruction and leadership that leads to authentic STEM learning and integration, supports the planning and implementation of any program and is not one size fits all. It allows people to self-assess, help programs grow, and continue to build capacity. The tool is in the final stages of field testing and will then be disseminated statewide.

**Mindy Curless**, STEM Initiatives Consultant, Kentucky Department of Education

An engineer by trade, Mindy spent 20 years working as an engineer before transitioning to K-12 education as a teacher and now STEM Consultant for the Kentucky Department of Education. At the Department of Education, Mindy ensures that STEMx projects are aligned with the Department of Education. Over the last six years the Department of Education has worked closely with school districts and higher education institutions to build capacity in teacher leadership and implementation of Common Core State Standards and Next Generation Science Standards. This involved districts sending representatives from elementary, middle, and high school levels to monthly regional meetings over the course of three years to develop teachers’ capacity to understand the new standards, shift their teaching practices, implement standards, understand the formative assessment, and build leadership amongst teachers. For administrators, their meetings allowed their understanding of the content, of how to develop capacity to enable teacher leaders, and of how to set up leadership teams to make systemic change in their district. These meetings included postsecondary leaders and facilitated natural networking opportunities and built community. Kentucky has seen great improvements, particularly in English Language Arts and Math, and hope to see similar results in science when the process finishes this year.
Through the Maryland State Department of Education and partnerships, STEM is being integrated throughout PreK-12 content areas across all school districts. Over the last few years they have established a STEM Standards of Practice for the state, conducted professional learning days for teachers across the state, and built a strategic plan. Working closely with state, local, education, community, and business leaders Maryland STEM is currently focusing on building a computer science framework to help expand access to computer science education across the state. They are also working on career development pathways through the development of a pilot youth apprenticeship programs.

**FACTS**

- Maryland STEM provides service and support to all 24 public local school systems in Maryland serving 866,169 students.
- In Maryland, a 17% job growth is predicted in Professional, Scientific, and Technical areas (STEM) between 2012 and 2022.
- During the 2014-15 school year, nearly 300 teachers from all 24 school systems in all grade bands received STEM education training.

**PROFILES**

**Cindy Hasselbring, Special Assistant for Special Projects, Maryland State Department of Education**

Cindy Hasselbring is responsible for bringing together people from across departments within the Maryland State Department of Education, the state’s 24 school districts, and business and local leaders to integrate STEM throughout Maryland. Over the last two years she has helped bring a focus to STEM education in Maryland by helping create a strategic plan and conducting teacher professional development workshops across the state. She is currently focusing on building a PreK-12 computer science framework for Maryland school districts. This includes finding ways to certify teachers in computer science, including employees from the private sector that want to engage in their local schools; working with higher education institutions to build programs for future teachers and further implementation of CTE pathways in districts; and working to have every district in Maryland offer AP Computer Science, eventually having every high school in the state offering the course. The framework is anticipated to be completed by late spring 2016.

**Brian Dulay, Executive Director, Maryland Business Roundtable for Education**

Brian Dulay serves as the Executive Director of the Maryland Business Roundtable (MBRT) for Education. Unlike other business roundtables across the country, Maryland’s organization was formed by businesses to make a long-term commitment to education in the state. MBRT has worked closely with the Maryland State Department of Education for several years, becoming a key partner, particularly where it’s related to STEM education. A key program is STEMnet, an online platform designed to connect teachers and professionals. The site offers two levels of engagement - speakers and specialists, who co-teach a lesson with teachers for a more hands-on experience. Opportunities are available in every district in the state, providing STEM experiences to students and professionals regardless of location. Both professionals and educators find the system a great tool to connect with one another and allow students to be exposed to a breadth of STEM professionals in a way that works with the individual classroom.
The North Carolina Science, Mathematics, and Technology Education Center (SMT Center) launched in 2003 to improve education in North Carolina to ensure all students have the knowledge and skills for successful careers, to be good citizens, and advance the state's economy. They worked closely with the legislature and state government to launch the North Carolina Learning Network in 2012. The network believes that STEM is more than just Science, Technology, Engineering, and Math but rather Strategies That Engage Minds®. The STEM Learning Network provides a one-stop website for resources on the NC STEM Center portal, as well as a state STEM scorecard, STEM schools of distinction, and statewide network of partners.

FACTS

• The NC SMT Center partnered with the Smithsonian Science Education Center to direct an i3 project that trained 1,000 teachers to use inquiry instruction and materials that reached over 20,000 students in grades 1-8.

• The NC SMT Center developed a STEM only portal to share resources, assets, and calendar items with parents, educators, and students. To date there have been over 6,000 users.

• The NC SMT Center created a process with state government to identify STEM Schools of Distinction in North Carolina with state government.

PROFILES

Sam Houston, President and CEO, SMT Center
Sam Houston has more than 50 years of experience in public education, policy and government in North Carolina that he brings to SMT Center and North Carolina STEM Learning Network. His experience helps in building vital partnerships across the state, including those needed to establish the Schools of Distinction. The STEM Learning Network, Friday Institute for Educational Innovation, and Department of Public Instruction (DPI) all came together to develop the attributes and rubric of a STEM school. Schools that are interested in becoming a STEM school can self-assess where they are within the attributes and then work to grow and improve their school to become a STEM School of Distinction. To be recognized, schools must submit a rigorous, evidence-based application with DPI; they are then evaluated and recognized accordingly at the prepared or model levels. Many of the recognized schools are now a part of the evaluation process - serving as leaders and building a network amongst each other.

Lisa Rhoades, Senior Program Associate, SMT Center
Lisa Rhoades is part of the two-person SMT Center team with Sam and works on a variety of programs at SMT Center. The often silent partner of STEM efforts throughout North Carolina, SMT Center recently completed a five-year i3 evaluation grant with the Smithsonian Institute and districts in North Carolina, northern New Mexico, and Houston, Texas. Schools in the study received professional development and science kits over the years to measure success of high-quality materials and professional development. The schools, working with Lisa and Sam, have secured additional funding to continue the program and are now working with the participating districts in North Carolina, providing guidance to them to integrate the program at a larger scale and eventually handing full control to the districts.
Empire STEM is a statewide, community-led collaborative. The Network’s mission is to advance STEM education to prepare all students for success in school, work and life to fuel innovation and economic vitality in the Empire State. Empire STEM advocates for policies to advance STEM education, contribute to promising STEM practices and programs, support innovative STEM teaching, and develop public/private partnerships to engage a wide-range of stakeholders. Through regional hubs throughout the state, Empire State STEM Learning Network is building a systemic approach to to prepare students for success.

FACTS

• In New York state, people who work in STEM careers earn a median salary of $75,700 per year. This is 85% higher than the average of $40,870 for all workers in the state.

• The New York State STEM Incentive Program provides a full tuition scholarship to the State University of New York or the City University of New York to the top 10% of students in each NY high school who pursue a STEM degree program and agree to live and work in a STEM field in the state for five years after graduation.

• There are 625 outstanding educators in the New York State Master Teacher Program; they have been recognized for their dedication to providing the most innovative STEM education to their students, their commitment to professional growth, and their enthusiasm for sharing their successful practices with colleagues in their schools and districts.

PROFILES

Cheryl Davidson, Corporate Director of Workforce Readiness, North Shore - LIJ Health System

Cheryl Davidson works for the largest private employer in New York as the Corporate Director of Workforce Readiness. In her role she helps co-steward the Long Island STEM Hub as well as oversees outreach programs for veterans and students in the region so they know about the career opportunities at North Shore - LIJ Health System, many of which are STEM jobs. The STEM Hub has a variety of programs for students and teachers including exploration days, expos, competitions, and professional development workshops. Every November the Long Island STEM Hub partners with employers across the region to provide one-day intensive workshops that give teachers insight into a particular industry and how to integrate those lessons into their curriculum. Topics include computer science, healthcare, engineering, aviation, and manufacturing. Cheryl credits industry partnerships with the success of the hub - with industry connection early on students know what their post-school opportunities could be and end up staying, helping the local economy thrive for years to come.

Johanna Duncan-Poitier, Senior Vice Chancellor for Community Colleges and the Education Pipeline, The State University of New York

Johanna Duncan-Poitier is the Senior Vice Chancellor for Community Colleges and the Education Pipeline for the State University of New York (SUNY). She provides leadership to strengthen STEM education, teacher preparation, and connections between SUNY’s 64 campuses and New York State’s Pre K–12 schools and business leaders to improve college readiness, completion rates and prepare a highly-qualified workforce. At SUNY, she led the launch and development of a statewide collaborative of cradle-to-career partnerships, the Smart Scholars Early College High Schools, the SUNY Empire State STEM Learning Network, and the development of a multi-million dollar consortium of 30 community colleges dedicated to high-demand careers. SUNY’s Office of the Education Pipeline partnered with the New York Academy of Sciences (the Academy) and SUNY Empire State College to scale a successful after-school program in Brooklyn in which graduate students and postdoctoral fellows mentor middle school students from high-need school districts in STEM. This program will be introduced in urban and rural communities across New York state over the next three years.
The Ohio STEM Learning Network (OSLN) is comprised of seven regional Networks with 31 designated STEM schools. The network was launched in partnership with Battelle, Ohio Business Roundtable, the State of Ohio, Gates Foundation, and additional partners. It is focused on giving all kids across Ohio the opportunity at excellent STEM education. Through their regional networks and schools, OSLN trains teachers on innovative teaching and learning practices and spreads best practices to schools across the state and country.

**FACTS**

- The OSLN has 31 STEM schools across the state - in urban, suburban, and rural communities.
- OSLN trained 9,000 educators in the last 4 years in effective STEM teaching and learning practices.
- At Ohio’s STEM schools, 25,311 hours of internships were completed in 2014-15.

**PROFILES**

**David Burns, Director, Battelle STEM Innovation Networks**

As Director of STEM Innovation Networks for Battelle, David is a national leader on STEM issues. He helps share best practices from Ohio and other STEMx states across the nation. Prior to joining Battelle, David was an Assistant Superintendent at the Ohio Department of Education, overseeing the statewide STEM strategy, planning and programming, and Career and Technical Education programs. He credits the success of OSLN with their ability to be opportunistic and reinvent themselves as things change - be it funding or new school models - while staying true to their mission of creating more STEM environments for students to learn and succeed in. Additionally, their close relationship with the Department of Education and being the approving body for new STEM schools allows them to continue to succeed and make a difference in Ohio.

**Dr. Stephanie Johnson, Director, OSLN at Battelle**

Stephanie supports, promotes, and connects the networks in Ohio - keeping them abreast of the work happening across the state and any opportunities that arise. Additionally she helps the networks develop professional development to educators, arranges tours at STEM schools, and promotes their various activities. She is most proud of the diversity of the 31 STEM schools; each meets the needs of their community - whether urban, rural, or suburban - and have a variety of focuses, from medicine to agriculture to technology. Nine of the schools serve as training sites, providing professional development opportunities for educators from around Ohio. These professional development sessions are incredibly valuable as they are given by teachers who are currently in the classroom and are able to share their personal challenges and successes of implementing the changes in teaching and learning. These programs allow great STEM education to be spread to every school - a teacher can come to an OSLN training and take it back to their school, expanding great STEM education to all students.
The Oklahoma State University (OSU) Center for Research on STEM Teaching and Learning (CRSTL) engages in collaborative research and outreach to improve STEM education by matching the needs of Oklahoma’s classrooms with the innovations of OSU’s premiere scientists and engineers. CRSTL strives to be a hub for research on teaching and learning in Oklahoma and across the science and mathematics disciplines. Research focuses on engineering in elementary grades and advancing earth science studies in grades K-14. CRSTL hosts teacher professional development day in the summer to provide workshops for K-8 teachers.

**FACTS**

- From 2012 to 2022, STEM jobs in Oklahoma are expected to grow 10.8 percent
- 50% of Oklahoma’s first-time community college students need remediation in math, which costs the state $11,598,462 each year.

**PROFILES**

**Toni Ivey, Assistant Professor of Science Education, OSU**

Toni’s research interests include beginning science teacher induction, in-service teacher professional development, education policy, and geoscience education. While pursuing a Master’s degree in Geology, she found a passion for science teaching, became certified to teach high school science, and completed a Master’s in Curriculum and Instruction from TAMU. Toni taught Integrated Physics and Chemistry, Chemistry, and Physics at MacArthur High School, Aldine ISD in Houston, TX. While in the classroom, she took on many leadership roles at the campus- and district-levels and helped in the development of science curriculum materials.

**Juliana Utley, Assistant Professor, OSU**

Juliana Utley became interim school head for the School of Teaching and Curriculum Leadership in the College of Education in January, 2015. A recipient of the OSU Regents Teaching Award in 2014, she brings more than 32 years of teaching experience to the position. Juliana joined the OSU faculty in 2004 and has been teaching at the University since 1999. She taught in Oklahoma public schools for 17 years. In addition, she is the co-director for CRSTL (Center for Research on STEM Teaching and Learning) and holds the Alice Phillips Endowed Professorship in Elementary Education. Juliana is an associate professor and serves on the curriculum committee for the newly-established OSUteach program.
Oregon’s STEM efforts center on driving innovation, opportunity, and prosperity for individuals, communities, and organizations. Led by the Chief Education Office—in partnership with the STEM Investment Council, the Department of Education, and the Higher Education Coordinating Commission—the state is developing policies and making investments to break down barriers, and to create an effective and seamless STEM educational ecosystem. Across the state, there are ten formalized regional STEM networks that unite schools, institutions of higher education, out-of-school educators, businesses, and civic leaders to spur local improvements at the systems-level, while also reducing inequities in opportunities for students of color and those in poverty. These partnerships leverage local resources and opportunities to engage, prepare, and motivate students both in, and beyond, the classroom. In addition to supporting the “backbone” coordination function of these regional networks, Oregon have secured legislative funding to support high-impact programs that the regions have identified as critical to achieving their local goals.

**FACTS**

- In 2015 the Oregon Legislature invested $21.4 million to create STEM pathways and learning opportunities for students across the state.
- In 2011 STEM Investment Council was created to advise the Oregon Chief Education Officer and governor on developing and overseeing a long-term STEM strategy.
- In just two short years, the statewide network of regional STEM Hubs have reached 1,800 educators and 13,000 students.

**PROFILES**

**Mark Lewis, STEM & CTE Policy Director, Oregon Chief Education Office**

As STEM Education Director, Mark Lewis brings over 25 years of experience in STEM, including a career as a satellite engineer, high school math and science teacher, professional development educator, and strategic education planning. A lifelong educator and advocate for youth, Mark is driven by a passion for the critical role that education has in shaping the lives and prosperity of individuals and communities. As STEM Education Director, Mark oversees Oregon’s policy and investment efforts to match the education system with workforce needs, including the creation of a statewide network of regional STEM hubs, and directing the work of the STEM Investment Council.

**Jim Piro, Chair, Oregon STEM Investment Council**

Jim Piro is President and Chief Executive Officer of Portland General Electric (PGE), and is a staunch advocate for improving STEM education within Oregon. In addition to chairing the STEM Investment Council, Jim co-chairs the CTE-STEM Employers Coalition and also serves on Oregon’s Global Warming Commission, and the Oregon Business Council. Jim has a passion for addressing the disparities of opportunity and attainment that exist for our most vulnerable populations, and has led investment efforts to ensure that we are serious about investing in our communities of color and our communities in poverty.
The Pennsylvania STEMx™ Network was launched by ASSET STEM Education™, an education improvement nonprofit that serves as the state lead organization on the national STEMx™ network. Pennsylvania’s network began as a grassroots effort to bring together statewide leaders to improve STEM teaching and learning. The network currently represents STEM education organizations, K-12 education, out-of-school time providers, higher education, business, workforce development and professional education associations.

FACTS

• Pennsylvania has formed an active affinity group comprised of representatives from 22 diverse stakeholders from across the Commonwealth.

• During the next decade, STEM jobs in Pennsylvania will grow by 12 percent compared to 7 percent for non-STEM jobs.

• Pennsylvania was recently awarded two grants to support STEM Ecosystems in Pittsburgh and Philadelphia.

PROFILES

Cynthia Pulkowski, Executive Director, ASSET STEM Education

Cynthia Pulkowski serves as the Executive Director at ASSET STEM Education, a Pittsburgh-based STEM education improvement nonprofit. As Executive Director, she is dedicated to providing STEM educators with ongoing resources and programs to help move students from STEM literacy to STEM fluency. She also served as project director for ASSET’s statewide, five-year, $50 million Science: It’s Elementary initiative in partnership with the Pennsylvania Department of Education (2006-2011) as well as its $20.2 million U.S. Department of Education Investing in Innovation Validation grant (2010-2015) working with 24 rural and high-needs schools across the Commonwealth. Her approach to program development uses current research on educational practices to coordinate the design and implementation for new products and services in conjunction with the organization’s strategic plan.
In 2010, the Tennessee Department of Education partnered with Battelle to launch the Tennessee STEM Innovation Network. (TSIN) They are committed to helping the State of Tennessee inspire and train the next generation of innovative leaders. TSIN develops high-quality STEM programming to further ensure Tennessee students are college and career ready upon graduation. It utilizes STEM Platform Schools and seven Regional STEM Innovation Hubs located across Tennessee to increase student interest and participation in STEM fields.

FACTS
• In just 4 years, Tennessee students have climbed from 46th to 25th in fourth grade math achievement according to the Nation’s Report Card.
• Workforce forecasts show that by 2018, Tennessee will have more than 100,000 STEM jobs – or nearly 14,000 more STEM jobs than the state had in 2008.
• TSIN has made Learning Blade, a supplemental STEM career awareness curriculum, available at no cost to all middle schools in the state.

PROFILES

Wes Hall, Director, Tennessee STEM Innovation Network
As director of TSIN, Wes Hall builds relationship across the state with government, business, and community leaders. Over the last five years, TSIN has launched 7 regional STEM Innovation Hubs that serve all 95 counties in the state thanks to significant investment and partnership from the state and local communities. Every region has access to STEM learning opportunities and professional development for teachers. Wes is most proud of their work in building leadership capacity in all schools through the Innovative Leaders Institute. The year-long program is led by effective principals that train other principals and teacher leaders across the state in impactful STEM strategies. The cohort of leaders working together on the same issues helps create a community of leaders across the state.

Keri Randolph, Assistant Superintendent of Innovation, Hamilton County Department of Education
Most recently the Southeast Tennessee STEM Hub Director, Keri oversaw the Hub’s 1:1 technology initiative, teacher professional development, and digital literacy programs. She also leads the region’s STEM Teaching Fellows, a year-long cohort of local teachers building their capacity and leadership in STEM education. The program builds camaraderie between teachers and community with teacher and business leaders. Through the STEM Hub, teachers and business leaders have been engaged in a number of activities over the last three years, including open conversations and job shadows. These activities have helped teachers understand local workforce needs and business leaders understand the education system. Keri recently joined the Hamilton County Department of Education as their Assistant Superintendent of Innovation. She will be providing support for teaching and learning in innovative practices and building community partnerships to connect business in meaningful ways to schools and classrooms.
Educate Texas is a public-private partnership focused on a common goal: improving the public education system so that every Texas student is prepared for success in school, workforce, and life. The T-STEM Model is focused on students being STEM literate and increasing the number of students entering post-secondary STEM programs. To do this Educate Texas works with school leadership to support leadership development and effective teaching to improve academic achievement for all students.

FACTS
- Texas has 103 T-STEM Academies serving more than 65,000 students across the state.
- Educate Texas has created a STEM district model in partnership with Texas Instruments Foundation, the first district in Lancaster, TX serves as a model for future districts who will soon be following them to become STEM districts.
- Educate Texas has developed a Texas Regional STEM Degree Accelerator program to strategically increase the number of underrepresented students earning STEM degrees that meet regionally-identified workforce needs across Texas.

PROFILES

**John Fitzpatrick, Executive Director, Educate Texas**

John Fitzpatrick serves as the Executive Director of Educate Texas, playing a key role in connecting the organization to the Texas Education Agency, workforce, higher education institutions, and philanthropic groups to find STEM solutions for Texas. One of these programs is the Texas Regional STEM Degree Accelerator (TRSDA). This initiative is focused on convening regional groups from education and workforce partners to expand the number of students with STEM credentials. The goal is to ensure that 100,000 underrepresented students in Texas earn STEM degrees. To expand the number of students with STEM credentials, regional partners must work together to analyze data, introduce interventions that improve curricula, and provide support for students.

**Reo Pruitt, Chief STEM Program Officer, Educate Texas**

As Chief STEM Program Officer, Reo Pruitt is responsible for the T-STEM Network, including the seven regional centers and T-STEM Academies. The T-STEM Network offers a fundamental approach to empower teachers, inspire students, and advance STEM careers. The cornerstone of the T-STEM Academy learning is student engagement and exposure to innovation and design in STEM-focused instruction based on real-world connections. Educate Texas developed a T-STEM Blueprint to support the development and implementation of T-STEM on campuses across Texas. The seven benchmarks, the cornerstone for achieving success, are: mission driven leadership; culture and design; student outreach; teacher recruitment and retention; curriculum, instruction, and assessment; strategic alliances; and advancement in sustainability. Educate Texas provides the Technical Assistance for the Texas Education Agency and works collaboratively to continue building out the T-STEM Model.
Washington STEM is focused on driving innovation, excellence, and equity in STEM education. They aim to lead the STEM charge in Washington State, and serve as a model for innovative thinking and action for STEM organizations nationwide. Washington STEM works with business, education, and community partners to nurture and scale breakthrough ideas in STEM education, invest in communities to grow networks of STEM professionals and educators, and advocate for important policy changes.

FACTS

• Washington STEM is a statewide organization that serves almost half of Washington state’s students (430,000; 52 percent free and reduced lunch; 48 percent minority) and approximately 45,000 teachers through their statewide networks and initiatives.

• There are currently 25,000 unfilled jobs in Washington due to a lack of qualified candidates; 80% of those jobs are in high-demand STEM fields. In the next four years, 45,000 jobs in Washington will go unfilled due to lack of qualified candidates.

• Their STEM-PD pilot has reached 400 teachers from 51 schools across Washington.

PROFILES

Patrick D’Amelio, CEO

As CEO of Washington STEM, Patrick D’Amelio is responsible for the management, programs, and infrastructure of the organization. He has spent his career bringing educational opportunities and critical developmental support to children, particularly those from underserved populations. At Washington STEM, Patrick has overseen the expansion of their regional STEM Networks to seven, soon to grow to 10 in the coming year. He’s also helped foster an innovative teacher professional development program using technology (STEM-PD). Through collaboration, effective fundraising, and focusing on equity, Washington STEM is seeing progress across the state in improving STEM for all students.

Caroline King, Chief Policy Officer

Caroline King has worked for 15 years improving public schools, accelerating student performance, and closing educational achievement gaps. She led the design and incubation process for Washington STEM while at the Partnership for Learning, then transitioning to her current role. As Chief Policy Officer, Caroline works with leaders in local communities and the state government to bring pragmatic, non-partisan policy solutions to fruition to improve STEM education in Washington. Working with the STEM Networks, Caroline co-develops legislative agendas and fosters support for STEM policy issues. This work has resulted in Washington allowing Advanced Placement Computer Science to count as a math or science credit towards graduation; creation of the Governor’s STEM Education Innovation Alliance; adoption of the Next Generation Science Standards; increased access to computer science education; support of teachers’ professional development; and additional funding to build STEM classrooms in Washington state.