



MASSACHUSETTS STEM SUMMIT 2013

10 YEARS OF STATEWIDE COLLABORATION

HOSTED & SPONSORED BY



Governor's STEM Advisory Council



MEDIA PARTNER



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Event Schedule

7:30am – 9:30am

Registration Opens

7:30am – 8:45am

Breakfast Buffet

8:45am – 9:30am

Opening Welcome and Remarks (East Atrium)

- **Dr. Robert Caret**, President, University of Massachusetts
- **Governor Deval Patrick**, Governor, Commonwealth of Massachusetts
- **Congressman Joseph Kennedy**, Honorary Chair, Governor's STEM Advisory Council
- **Bryan Morry, Executive Director**, The Hall at Patriot Place presented by Raytheon
- **Kelly Powers**, Massachusetts STEM Teacher of the Year, The Hall at Patriot Place presented by Raytheon

9:30am – 9:45am

Break

9:45am – 11:00am

Breakout Session I

- Building School District Capacity to Support Computer Science: Superintendent/Business Leader Panel
- Building Sustainable PreK-12 STEM Programs One District at a Time
- Digital Resources to Engage Students in STEM
- Identifying and Developing Students' Conceptual Thinking in Science
- Integrating STEM Concepts & Practices into Classroom Experiences to Promote Engagement & Learning
- It's Elementary: Inspiring STEM Students from PreK-6th Grade
- Leading STEM Reform on Your Campus
- MA State STEM Plan 2.0
- The New MA Common Core Mathematics Standards & Assessments Increasing Students' Mathematical Understanding
- Scaling the Applied Manufacturing Career Pathways Pyramid
- Structuring Partnerships: What Makes Afterschool Programs Work?
- Teaching Computer Science: Great for Our Students and the Massachusetts Innovation Economy
- Training for Jobs in Life Sciences: What Happens After High School?

11:00am – 11:15am

Break

Event Schedule

11:15am – 12:30pm

Breakout Session II

- Bridging the Divide: Incorporating Identity and Culture to Sustain STEM Engagement
- Designing a Curriculum for Deep Learning
- Draft Revised State Science and Technology/Engineering Standards
- Engineering Adventures in Afterschool
- Examining the Intersection of the Standards for Math Content and Standards for Math Practices
- Global Connections in Science
- GO PUBLIC: Conversation with Student STEM Majors at MA Public Colleges and Universities – Session 1
- MA State STEM Plan 2.0: Discussion and Implementation Strategies
- Middle and High School Students Demonstrate Computer Science Success Stories
- Pathways to STEM Careers: Aligning Industry, Educators and Parents to Raise Student Awareness
- Putting the “M” in STEM
- Research-Based STEM Resources: Closing the Gap between Researchers and Practitioners
- STEM Innovation and Entrepreneurship (Morning Session)
- STEM Pathways from Secondary through Post-secondary Education
- STEM Sprouts in Preschool: How Museums, Libraries & Public Broadcasters Support Early STEM Education
- Tying College to STEM Careers: MA Community Colleges & Workforce Development Transformation Agenda

12:30pm – 12:45pm

Break

12:45pm – 2:15pm

Luncheon & Keynote (East Atrium)

- **Donna Cupelo**, Region President, Verizon New England and Chair, Mass Business Roundtable
- **Kara DiGiacomo**, Executive Director, Biogen Idec Foundation announcing Ignite the Power of STEM Grants Program
- **Carl and Anna Mracek Dietrich**, Co-founders, Terrafugia

2:15pm – 2:30pm

Break

2:30pm – 3:45pm

Breakout Session III

- Afterschool and Out-of-School Time Roundtable Discussion
- Developing the Child's Interest in STEM: Moving from Theory into Practice
- Digital Games for STEM Education
- Giving Job Seekers a Boost to the First Rung of the STEM Career Ladder
- GO PUBLIC: Conversation with Student STEM Majors at MA Public Colleges and Universities – Session 2
- Higher Education Partnerships through the Continuum: K-12, Colleges and into STEM Workforce
- Higher Education and Industry Partnerships for Career Awareness
- Integrated STEM Curriculum and Teaching
- Introduction to the Science and Engineering Practices
- MA State STEM Plan 2.0: Contextualized Conversations
- Model Curriculum Units as Key Resources for STEM Implementation
- STEM Innovation and Entrepreneurship (Afternoon Session)
- Using Engineering Practices to Bridge the STEM Gap
- Where the STEM Jobs Are

3:45pm – 4:00pm

Break

4:00pm – 4:30pm

Closing, Regional Networking and Raffle (East Atrium)

Plenary Speaker Bios

Robert L. Caret, Ph.D.

Robert L. Caret is the 26th President of the University of Massachusetts, which this year celebrates the 150th anniversary of its founding. The 70,000-student University of Massachusetts system consists of the flagship campus in Amherst, along with campuses in Boston, Dartmouth, Lowell and Worcester. The Worcester campus is the home of the Commonwealth's public academic medical school. The state's new public law school is based at UMass Dartmouth. The University has an annual operating budget of \$2.9 billion, graduates more than 15,000 students a year and has nearly 450,000 alumni worldwide. UMass annual research expenditures are in the vicinity of \$600 million and the University is an established national leader in generating licensing income. The President is the University's chief executive officer and works to advance its mission of education, research and public service. The President reports to the University of Massachusetts Board of Trustees.

Donna C. Cupelo

Donna C. Cupelo is region president — New England, a position she has held since March 1, 2008. She represents Verizon's corporate interests as a leader in delivering broadband and other wireless and wireline communications services to consumer, business, government and wholesale customers in the New England states. Prior to her current position, Cupelo held multiple leadership positions in Operations, Marketing and Sales.

Cupelo is active in many business, civic and charitable organizations in both MA and RI. In MA she is the chair of the Massachusetts Business Roundtable, on the Mass Tech Hub Collaborative, and on the Executive Boards of the Boston Private Industry Council, and the Greater Boston Chamber of Commerce.

In RI she serves as co-chair of the Greater Providence Chamber of Commerce Innovation Providence Implementation Council (IPIC) and is a member of Providence College's Presidents and Business School Advisory Councils. She is a member of the Executive Board of the Greater Providence Chamber of Commerce, and also serves on Brown University's Civic Leadership Board. She is the Verizon Volunteers Pioneers Denver Chapter executive sponsor.

Cupelo received a Bachelor of Science degree from Providence College, Providence, Rhode Island in 1978 and a Masters of Business Administration from Babson College, Wellesley, Massachusetts in 1982.

Anna Mracek Dietrich

Terrafugia's Chief Operating Officer (COO), Co-Founder, received her Bachelors and Masters degrees from the Department of Aeronautics and Astronautics at MIT. With experience at both GE Aviation and Boeing Phantom works, Anna brings project management expertise to the Transition® development effort. Anna was named one of the Boston area's top 15 Innovators by the Boston Globe, was one of the 10 women selected for the 6th annual Mass High Tech Women to Watch Award, and has been recognized by Engineers Week New England with their annual Achievement Award. Anna is active in the ASTM industry standards committees that work to write requirements for both Light Sport and General Aviation Aircraft and serves on the Board of Directors of Women in Aviation International (WAI). She has also spoken at TED Global and is a private pilot.

Carl Dietrich

Terrafugia's CEO/CTO, Co-Founder, received his BS, MS and Ph.D. from the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology (MIT) shortly after being selected as the 2006 winner of the prestigious Lemelson-MIT Student Prize for Innovation. Carl was additionally recognized by the Aero/Astro Department at MIT as one of sixteen exceptional graduates under the age of 35. Carl has also received "40 Under 40" awards from the Boston Business Journal and Aviation Week & Space Technology magazine. Carl has spoken internationally and is generally regarded as the leader of the emerging modern flying car industry. He has been a private pilot since the age of seventeen.

Kara DiGiacomo

Kara DiGiacomo joined Biogen Idec, a global biotechnology company based in Cambridge, MA, in 2001. In her role as Executive Director of the Biogen Idec Foundation, Kara is responsible for building relationships with key stakeholders to maximize the investments the Foundation makes to advance global, national and local STEM initiatives as well as to support local projects in the company's operating communities of Greater Boston and Research Triangle Park, NC. Her passion is to create partnerships that connect students and teachers to individuals with science expertise to create excitement about STEM education and careers for students, teachers and society. Kara also serves as Senior Manager of Public Affairs and has responsibility for community relations, including work with statewide and local associations and government agencies. She leads Biogen

► PLENARY SPEAKER BIOS

Idec's employee volunteer program, which is highlighted annually through the company's signature global volunteer effort, Care Deeply Day, which in 2013 involved 28 countries and nearly 2,000 volunteers. Kara holds a BS in Marketing and Management from Babson College.

J. Lynn Griesemer, Ed.D.

J. Lynn Griesemer, Ed.D., M.P.A. is the Associate Vice President for Economic Development at the University of Massachusetts and the Executive Director of the UMass Donahue Institute. She is also an adjunct professor in the Public Policy and Administration program at UMass Amherst. Prior to joining the University, Dr. Griesemer was the Executive Director of the Northeast Regional Exchange, a seven-state, nonprofit collaborative in education for New England and New York. She held a faculty position and was the director of an education research and evaluation center at the University of Rhode Island.

Dr. Griesemer holds a bachelor's degree in mathematics from Cedar Crest College, a master's in mathematics education from the University of Tennessee, and a master's in public administration from the Kennedy School at Harvard University, where she was a Littauer Fellow. She received her doctorate in educational administration and curriculum from the University of Tennessee.

Since the formation of the University's five-campus system in 1991, Dr. Griesemer has worked closely with the President's Office, managing several system-wide initiatives in economic development and related areas including: incubation of UMassOnline; development and growth of the STEM Summit in collaboration with the Governor's STEM Advisory Council and the Mass Business Roundtable; development of the Academy for Newly Elected Legislators in Massachusetts; management of the Life Science Initiative resulting in the publication of *Growing Talent*; the development of *MassBenchmarks*; and the considerable expansion of the UMass Donahue Institute.

Joseph P. Kennedy III

Joseph P. Kennedy III was elected to represent Massachusetts' Fourth Congressional District in 2012. Joe has dedicated his career to public service, and as a member of the U.S. House of Representatives is committed to social justice and economic opportunity.

Prior to running for Congress, Joe served as an Assistant District Attorney in both the Middlesex County and Cape and Island's District Attorneys' Offices. He is a graduate of Harvard Law, was an active member of the school's Legal Aid Bureau — a pro-bono law firm that provided legal services to low-income families around Boston, and also co-founded an afterschool program for at-risk youth in the Boston area with his wife, Lauren.

Joe began his career with the Peace Corps in the Dominican Republic. While there, he worked in the rural community of Puerto Plata to implement an economic development project that helped to create jobs and increase the standard of living.

Joe also worked for the United Nations' Millennium Project as an international development analyst and anti-poverty consultant. Joe is fluent in Spanish and is a member of the House Committee on Foreign Affairs, as well as the House Committee on Science and Technology.

Born and raised in Massachusetts, Joe holds a bachelor's degree in Management Science and Engineering from Stanford University. He and his wife, Lauren, live in Brookline with their dog Banjo.

Bryan Morry

Bryan Morry rejoined The Kraft Group as The Hall's executive director during the venue's construction in December of 2007 after spending the previous two-plus years as the afternoon drive sports talk show host on the Score AM/FM in Providence, R.I. Before his radio stint, he was the editor of the Patriots official team newspaper, Patriots Football Weekly, from 1997–2005 where he covered the Patriots for the newspaper, patriots.com and as part of the Patriots Football Weekly television show. Bryan covered all three Patriots Super Bowl victories for PFW and authored the coffee table book, Patriots United — the New England Patriots World Championship Season, following the surprising Super Bowl XXXVI win over the St. Louis Rams. He currently oversees all museum operations. The Hall's partnership with Raytheon has helped it develop a strong STEM education program and implement programs such as The Hall at Patriot Place presented by Raytheon Massachusetts STEM Teacher of the Year program, among others. He also is on the board of directors of the International Sports Heritage Association (ISHA) for whom he chairs the communications committee. He graduated from Boston University in 1993 with a BA in Journalism degree and has written for various local and national publications and websites.

Governor Deval Patrick

Deval Patrick was elected as Governor of the Commonwealth of Massachusetts in 2006 on a platform of hope and change. Now in his second term, Governor Patrick continues to be committed to expanding opportunity and prosperity in Massachusetts despite the challenging economic environment. The Patrick administration has maintained or expanded the state's investment in critical growth sectors while delivering timely budgets and cutting state spending. Governor Patrick funded public education at the highest levels in the history of the Commonwealth and its school reform initiatives earned Massachusetts the top spot in the national Race to the Top competition. And through targeted initiatives that play to the Commonwealth's unique strengths, like his landmark 10-year, \$1 billion program to promote the state's life sciences industry, the Governor has positioned the state as a global leader in biotech, bio pharmaceuticals and IT, and as a national leader in clean energy, including making Massachusetts home to the country's first offshore wind farm.

Patrick came to Massachusetts in 1970 at the age of 14. A motivated student despite the difficult circumstances of poor and sometimes violent schools on the South Side of Chicago, he was awarded a scholarship to Milton Academy through A Better

► PLENARY SPEAKER BIOS

Chance, a Boston-based organization. Governor Patrick is a graduate of Harvard College, the first in his family to attend college, and of Harvard Law School. After clerking for a federal judge, he led a successful career in the private sector as an attorney and business executive, rising to senior executive positions at Texaco and Coca-Cola. In 1994, President Clinton appointed Patrick as Assistant Attorney General for Civil Rights, the nation's top civil rights post. It has been Massachusetts people, schools, and institutions that have given Governor Patrick the opportunity to excel, and he sees his service as governor as pay-back for the opportunities the Commonwealth has given him.

Diane and Deval Patrick have been married for more than twenty-five years and have two adult daughters.

Kelly Powers

Kelly Powers is a teacher of Computer Science at the Advanced Math and Science Academy in Marlborough. She has taught Computer Science for the past 15 years and serves as Department Chair and curriculum leader for grades 6-12. Prior to teaching, Kelly worked as a large systems computing specialist for IBM, John Hancock, and Harvard. Kelly is the co-president of the Greater Boston Computer Science Teachers Association Chapter and has been working with MassCAN and MassTLC on major CS education advocacy efforts in the state.

In 2012, Kelly was awarded the Mass TLC Workforce Development Leader of the year for helping students and teachers discover and develop a passion for computer science.

As a passionate educator, Kelly's goal is to engage all students and prepare them for STEM careers by having students learn how to think computationally and build their confidence in solving problems by creating artifacts. In particular, Kelly has taken advantage of many outreach programs to increase girls' participation in computing. Her latest projects include engaging over 100 students weekly in an extraordinary after school program that includes Mobile App Development, Programming Competitions, Robotics competitions, Art and Robots, Game Design, Zero Robotics, and Cyber Forensics.

As a recent recipient of an NSF grant, Kelly will work with MassCAN, EDC and UMass Boston to provide an opportunity for school districts throughout the state to implement programs in computing that will begin to prepare our students to fill the nearly 1.4 million predicted job openings in Computer Science by 2020.

Kelly has an MBA/MIS (Masters in Business with a concentration in Information Systems) and MAT/Masters in Teaching with a certification in Middle School Mathematics

Breakout Sessions

► MORNING SESSION I

Building School District Capacity to Support Computer Science: Superintendent/Business Leader Panel

Time: 9:45am – 11:00am | Room: Red Level, Suite 16
Strand: K-12 Education

Business leaders will address four issues: Why do we need to prepare all students to have basic computing skills to negotiate the rest of the 21st Century? Why do our state and national economies need many more students prepared and inspired to pursue computer science careers? Why do our goals for equal opportunity require that we prepare and inspire many more young women and underrepresented minorities for these extraordinary careers of the future? How can the business community support Professional Development efforts to realize these goals? Superintendents will address three issues: How has supporting teachers who want to be innovators in expanding opportunities for students to pursue 21st Century careers in Computer Science benefitted our school system? What advice do we have for other school districts where there is interest in introducing/providing more Computer Science courses? How might more superintendents, statewide, be encouraged to respond to the educational and workforce imperative of providing many more students with the opportunity to pursue Computer Science careers? The Moderator will ask the business leaders to address emerging national issues: the importance of Computer Science Education Week 12/8 – 14; the films available for free on code.org and other resources; and, the importance of having Computer Science courses count for Math high school graduation credits.

HOST/MODERATOR

Jim Stanton, Ed.D., MassCAN Executive Director and Senior Project Director, Education Development Center, Inc.

PRESENTERS/PANELISTS

Steve Vinter, Ph.D., Massachusetts Engineering Site Manager, Google
Anmarie Levins, J.D. & Ph.D., Associate General Counsel, Microsoft
Dean Blase, M.Ed., Director of Curriculum & Instruction, Wellesley Public Schools
David DeRuosi, Ed.L.D., Superintendent, Malden Public Schools
Laura Chesson, Ed.D., Assistant Superintendent, Arlington Public Schools

Building Sustainable PreK-12 STEM Programs One District at a Time

Time: 9:45am – 11:00am | Room: Red Level, Suite 20
Strand: K-12 Education

The Gateway Model is a means of opening a doorway for educational leaders to build capacity to implement engineering and technology at all levels, prekindergarten through high school. This program engages district and regional teams to design and plan for implementation of STEM programs that effectively integrate technology/engineering. Gateway teams communicate at three-day summer institutes; follow-up meetings during the year, site visits, and through an electronic bulletin board. Other elements of the model include online and physical resources designed to provide the tools educators need to implement the rigorous standards-based curriculum and assessments K-12, annual symposium, and additional technical support. The success of the program has been the 400 educational leaders that have participated, including lead teachers, science and technology coordinators, principals, and other administrators, representing 90+ school districts in MA. In order to build leadership capacity and maximize the outreach efforts, we have successfully piloted a distributed model of leadership, in which an experienced Gateway district team leader heads the geographic region surrounding their district. These leaders work closely with Gateway staff from the National Center for Technological Literacy®. The regional approach maximizes capacity and builds sustainability of this initiative in the state. This presentation will focus on the elements of the Gateway Model, as well as engage participants in hands-on activities that demonstrate the ability to connect technology and engineering in the curriculum PreK-12.

HOSTS/MODERATORS

Yvonne Spicer, Ed.D., Vice President & Gateway Project Director, National Center for Technological Literacy
Nancy Pymonto, M.S., Teacher Educator, National Center for Technological Literacy
Brenda Neagle, M.A., Regional Leader, Middleboro Public Schools

Digital Resources to Engage Students in STEM

Time: 9:45am – 11:00am | Room: Red Level, Suite 69
Strand: Digital Education

The national call to increase the number of students who are prepared to pursue careers in STEM fields demands a new approach to STEM education. Student engagement is critical to inspiring students to stick with STEM courses as content becomes more challenging in the post high school years. Digital resources encompass a wide range of tools that provide exceptional value in the STEM classroom and are a great way to spark student interests, engage students in minds-on learning, and provide access to state-of-the-art interactive media.

During this session, participants will learn about a variety of categories of resources that can greatly enhance the secondary STEM classroom. Part of this session will focus on the benefits of repositories that contain freely available, high quality, peer reviewed science resources. These resources support both teachers and students alike by enhancing background knowledge and teachers' classroom presentations, while also providing a means to increase students' scientific literacy skills. A second portion of this session will focus on the power of high quality simulations, animations, and videos. Participants will learn how to best leverage these resources in the classroom. The session will also consider the "big picture" benefits of digital curricula, providing participants with an opportunity to learn about MOOCs and online STEM courses.

HOST/MODERATOR

Kim Spangenberg, M.S., Manager of STEM, The Virtual High School

PRESENTERS/PANELISTS

Louise Dube, M.B.A., Managing Director, Digital Learning, WGBH Educational Foundation/PBS Learning Media

Chad Dorsey, M.A., President and CEO, The Concord Consortium

Tamara Ledley, Ph.D., Senior Scientist, Chair of the Center for Science Teaching and Learning, TERC

Amy Michalowski, M.Ed., Director of Academic Affairs, The Virtual High School

Identifying and Developing Students' Conceptual Thinking in Science

Time: 9:45am – 11:00am | Room: Red Level, Super Suite
Strand: K-12 Education

This interactive session for K-8 educators will focus on how a variety of formative assessments (probes, interactive notebooks, card sorts, visual representations, etc.) can assist teachers in identifying how students understand certain scientific concepts, including their naïve ideas, partial understanding, mixed understanding and misconceptions. Knowing this, teachers can

more effectively plan their lessons to address where their students are and help them reach greater understanding.

HOSTS/MODERATORS

Joanne McDonnell, M.Ed., Assistant Professor of Education, Anna Maria College

Jeff Glick, M.Ed., K-6 Science Liaison, Worcester Public Schools

Integrating STEM Concepts & Practices into Classroom Experiences to Promote Engagement & Learning

Time: 9:45am – 11:00am | Room: West Club: Lounge 1
Strand: Early Childhood Education

In this workshop, pre-K teachers and administrators will be introduced to strategies for integrating STEM into the early childhood classroom using the MA STE standards as a backdrop. The workshop will address questions including: How can teachers address key STEM concepts and practices in ways that support children's natural curiosity and promote rich purposeful curriculum? How can STEM help meet the language and literacy needs of young children? What do teachers themselves need to know and be able to do in order to provide authentic STEM exploration and inquiry?

HOST/MODERATOR

Thomas L. Weber, J.D., Commissioner, MA Department of Early Education and Care

PRESENTER/PANELIST

Cindy Hoisington, M.Ed., Senior Curriculum and Instructional Design Associate, Education Development Center Inc.

It's Elementary: Inspiring STEM Students from PreK-6th Grade

Time: 9:45am – 11:00am | Room: West Club: Lounge 2
Strand: STEM Career Awareness

As the old adage goes, teach STEM early and often. Massachusetts is in the middle of a knowledge explosion. Our competitive advantage and the cornerstone of our economy rely heavily on a highly skilled workforce that supports high demand jobs in growing STEM fields, such as clean energy, life sciences, healthcare, advanced manufacturing, and information technology. It's never too early to start thinking about how we can invent our future! We all have a role to play to inspire, engage, and educate our youth across the entire lifelong workforce continuum, from early education through post secondary. STEM is an important tool in a PreK-6 tool kit that we can use to inspire our students early in their education through hands on learning, engage them in creative interests in science and math, and educate them about career options in order to adequately prepare them for

► MORNING SESSION I

college and career. During this panel, you will hear from three different practitioners who work with young students, from preschool programs to elementary and early middle schools ages. All have successfully integrated STEM in their teaching and community education.

HOSTS/MODERATORS

Lisa Freed, M.L.A., STEM Program Manager, iRobot

Richard Bransfield, M.A., Principal, Linden STEAM Academy (Innovation School)

Dr. Erika Ebbel Angle, Ph.D., Founder & Chairman of the Board, Science from Scientists

Leading STEM Reform on Your Campus

Time: 9:45am – 11:00am | Room: Red Level, Suite 22
Strand: Higher Ed (BA/BS+)

The vibrancy of our campuses creates multiple opportunities to create new, novel, and unique learning opportunities for our students. With the dedicated faculty we have on campus and in our schools, there really is no shortage of good ideas and worthwhile initiatives. BUT, why is it that many of these good ideas and initiatives never get implemented? Many of the bottlenecks to the change we seek occur during implementation of the practice. The presenters will engage with you in a workshop style participatory session using change management and best practices to create the ecosystem that allows for successful implementation of the desired STEM reform on campus. This is truly a workshop... and participatory.

HOST/MODERATOR

Darryl N. Williams, Ph.D., Associate Dean, School of Engineering, Tufts University

PRESENTERS/PANELISTS

Karen Oates, Ph.D., Dean, Arts & Sciences, Worcester Polytechnic Institute

Michael Malloy, Pharm.D., Dean, School of Pharmacy, Massachusetts College of Pharmacy and Health Sciences

MA State STEM Plan 2.0

Time: 9:45am – 11:00am | Room: West Club: Atrium
Strand: STEM Plan 2.0

Massachusetts developed its first state STEM Plan in 2010. However, we want to consider and update our vision and goals continually to reflect economic and societal needs of the state — present and future. During this session, STEM Plan 2.0 will be shared and an overview of the vision, goals, and outcomes of the plan will be presented, including how this plan fits into the broader context of the national STEM movement. Session presenters

will clearly articulate how version 2.0 of the plan was developed; how it will be used by the Governor's STEM Advisory Council to promote alignment among education, government, and industry; and the impact we would like to see it have at different levels in the Pre-K through higher education and workforce STEM system. Two follow-up sessions will take place later in the day. One session will be about the implementation strategies we can use to meet the goals of the plan. The other session will be used to bring people from similar communities of interest together to discuss what the STEM Plan means for their work.

HOST/MODERATOR

Joe Kennedy, Congressman, Honorary Chair, STEM Council

PRESENTERS/PANELISTS

JD Chesloff, Executive Director, Massachusetts Business Roundtable

Allison Scheff, Executive Director, STEM, MA Department of Higher Education

The New MA Common Core Mathematics Standards & Assessments Increasing Students' Mathematical Understanding

Time: 9:45am – 11:00am | Room: Red Level, Suite 21
Strand: K-12 Education

PARCC Educator Leader Fellows will highlight the most current information and resources designed to support effective implementation of the 2011 MA Curriculum Framework for Mathematics and state assessments. Resources showcased will include: videos of standards-based classroom teaching and learning; updates on the forthcoming PARCC (Partnership for Assessment of Readiness for College and Careers) field tests; newly released PARCC prototype test items that demonstrate the core shifts of the standards integrated into the design of the PARCC assessment items; and strategies to help parents and the community learn more about the standards and assessments.

HOST/MODERATOR

Barbara J. Libby, M.S..Ed., Retired STEM Director, Member of Common Core State Standards Writing Team, Massachusetts Department of Elementary and Secondary Education (retired)

PRESENTERS/PANELISTS

Jennifer Berg, Ph.D., Assistant Professor, Mathematics; PARCC Fellow, Fitchburg State University

Mark Healy, M.Ed., District Mathematics Coordinator, PK-12; PARCC Fellow, Cambridge Public Schools

Heather Ronan, Ph.D., Coordinator of Mathematics and Science, PreK-5; PARCC Fellow, Brockton Public Schools

Tamisha Thomspon, M.Ed., Mathematics Liaison; PARCC Fellow, Worcester Public Schools

Scaling the Applied Manufacturing Career Pathways Pyramid

Time: 9:45am – 11:00am | Room: Blue Level, Suite 20
Strand: Workforce Development

A workshop regarding the MACWIC advanced manufacturing career pyramid, how it works to fill the skills gap and the pipeline, and how it benefits the dislocated worker. The pyramid outlines the various skills and credentials necessary for each level of manufacturing employment from entry level through senior operations.

HOST/MODERATOR

Lisa Derby Oden, M.S., Workforce Program Coordinator, MassMEP

PRESENTERS/PANELISTS

Leslie Parady, C.A.G.S., Project Manager, MassMEP

Amy Ackroyd, B.A., Vice President of HR, TRU Corporation

Kathy Rentsch, Ph.D., Dean of Business and Technology, Quinsigamond Community College

Torbjorn Bergstrom, Ph.D., Mechanical Engineering Operations Manager, Worcester Polytechnic Institute

Structuring Partnerships: What Makes Afterschool Programs Work?

Time: 9:45am – 11:00am
Room: Blue Level, EMC Exec Center, Super Suite
Strand: Out of School Education

We all know that effective partnerships within and between community-based programs, schools, higher education institutions, businesses and professional societies are fundamental to the success and sustainability of STEM programming in afterschool settings. Panelists will discuss best practices and challenges in creating partnership structures in urban, suburban and rural settings.

HOST/MODERATOR

Cora Beth Abel, M.A., Executive Director, Massachusetts State Science & Engineering Fair (MSSEF)

PRESENTERS/PANELISTS

Donata Martin, B.A., Executive Director, Boys and Girls Club of Fitchburg and Leominster

Pat Hallberg, B.A., CEO, Girl Scouts of Central and Western Massachusetts

Penny Noyce, M.D., Trustee, The Noyce Foundation & Tumblehome Learning

Teaching Computer Science: Great for Our Students and the Massachusetts Innovation Economy

Time: 9:45am – 11:00am | Room: Red Level, Suite 15
Strand: K-12 Education

Although we value computing in our daily lives and can't live without the internet and our devices, "Computer Science as a discipline of study has not translated into a respectable presence in our system of education." (csta.acm.org) Four teachers from across the state will present an overview of Computer Science courses taught at their schools and demonstrate how its presence in their curriculum and in afterschool outreach programs is generating increased student interest in pursuing further CS study. At a time when computing skills are in high demand in all industries, these schools have created engaging programs to increase participation in Computer Science. The teachers leading these programs are trailblazers achieving success in attracting women, minorities and increasing enrollment in students taking AP Computer Science. Learn more about practices each teacher uses to engage students and attract students from all backgrounds to their programs. "Projections show that in the year 2020 there will be 9.2 million jobs in the "STEM fields" — and half of those jobs will be in computing and IT and there is not nearly enough talent in the pipeline to fill these vacancies." (Chris Stephenson, CSTA) These schools are leading the path to preparing our youth to solve complex problems, think computationally, analyze data, and become our future innovators. Attend this session and leave inspired to introduce exciting CS courses to your district and learn about how you can help fill the void in our workforce with the support of these outstanding educators.

HOST/MODERATOR

Heather Carey, M.A., Executive Director, Mass Technology Leadership Council Education Foundation

PRESENTERS/PANELISTS

Kelly Powers, M.A.T./M.I.S., Department Chair, Computer Science Grade 6-12 CS Teacher, Advanced Math & Science Academy Charter School

Elaine Mistretta, M.Ed., Math, Computer Science & Robotics Teacher, Rockport High School

David Petty, M.Ed., B.S., Teacher, Technology/Engineering Coordinator, STEM Coordinator; Winchester High School

Paul Marques, M.Ed., Teacher Computer Science / Math, Malden High School

▶ MORNING SESSION I

Training for Jobs in Life Sciences: What Happens After High School?

Time: 9:45am – 11:00am | Room: Blue Level, Suite 19
Strand: Workforce Development

As the Life Sciences industry continues to grow steadily in Massachusetts, “life sciences” and “biotechnology” have become the latest buzz words — and many people are wondering, “How do I get into this highly scientific field?” After all, over 80,000 MA residents work in the life sciences! But what does it take to enter this industry? What training options and job openings exist for students leaving high school and professionals seeking to reenter the job market? Attend our session and hear from our panel of recent graduates from certificate programs across the state as they demystify the training options and detail their job search process (and successes!). Programs represented will include Boston University’s BioScience Academy, Just-A-Start Corporation, Worcester Polytechnic Institute, Mount Wachusett Community College, and Quincy College’s Bridge to Biotech Program.

Attendees will also hear from an industry representative who will illuminate the type of worker that companies are looking for and the type of training that workers need to get their foot in the door. At the close of the session, representatives from each training program will be on hand to answer questions and share literature.

HOST/MODERATOR

Susan Buckley, M.A., Project Manager, Skilled Careers in Life Sciences (SCILS) Initiative, Boston Private Industry Council

PRESENTERS/PANELISTS

Richard Acheampong Allen, Cert., Supervisor, EMD Millipore
Johanna DeFrancisco, B.S., Senior Manufacturing Technician, Shire
Willow R. DiLuzio, Ph.D., Associate Director, Pre-formulation and Formulation, Millennium: The Takeda Oncology Company
Elena Fobert, B.S., Meaningful Use Training Coordinator, Partners Healthcare
Brenda Proctor, B.S., Customer Service and Sales Support, CellTreat Scientific Products
Tom Reynolds, B.S., Manufacturing Associate, Bristol-Myers Squibb

▶ MORNING SESSION II

Bridging the Divide: Incorporating Identity and Culture to Sustain STEM Engagement

Time: 11:15am – 12:30pm | Room: Red Level, Suite 20
Strand: Out of School Education

The current model of STEM engagement tends to ask middle and high school students to assimilate into STEM culture, instead of meeting them where they are. In other words, teachers often ask youth to leave their identity — as young people, as girls and young women, as urban dwellers, as individuals having racial, ethnic and cultural roots and experiences — at the door, so as to embrace an “objective” way of knowing. After school environment provides an opportunity to incorporate these other identities, to invite youth voice and choice, and bridge the divide between STEM and youth culture. Panelists will discuss how they have done so through the design of their programs, including science fairs and open-ended competitions.

HOST/MODERATOR

Connie Chow, Ph.D., Executive Director, Science Club for Girls

PRESENTERS/PANELISTS

Susan Klimczak, Ph.D., Education Director, South End Technology Center
Maisha Moses, M.A., Executive Director, The Young People’s Project
Ricarose Roque, M.Eng., PhD Candidate, Lifelong Kindergarten, The Media Lab, MIT

Designing a Curriculum for Deep Learning

Time: 11:15am – 12:30pm | Room: West Club: Lounge 2
Strand: Higher Ed (BA/BS+)

Studies show that engaged, active students are more likely to succeed in achieving deep learning in their science courses. However, designing engaging STEM courses that provide basic content can be challenging. This session will focus on what is known about learning through evidence-based studies conducted by the National Research Council/ National Academies of Sciences, Science Education for New Civic Engagement and Responsibilities (SENCER), as well as the emerging field of neurobiology of learning. We use this evidence to discuss how one can design a curriculum which fosters deep meaningful learning for our students. This will be an interactive session, modeling active learning techniques.

HOST/MODERATOR

Monica N. Joslin, Ph.D., Dean of Academic Affairs, Massachusetts College of Liberal Arts

PRESENTERS/PANELISTS

Tara Mann, Ph.D., Director of Operations, Office of the Dean of Arts & Sciences, Worcester Polytechnic Institute
Adrienne Wootters, Ph.D., Professor of Physics, Massachusetts College of Liberal Arts
Robert Milner, Ph.D., Associate Vice Provost for Professional Development and Professor of Neurology, University of Massachusetts Medical School

Draft Revised State Science and Technology/Engineering Standards

Time: 11:15am – 12:30pm | Room: Red Level, Super Suite
Strand: K-12 Education

The revised state Science and Technology/Engineering standards are now publicly available. This session will provide an overview of the key changes from the state's current standards to the draft revision. Participants will discuss implications of the changes and how to productively use the draft revision.

HOST/MODERATOR

Jacob Foster, Ph.D., Assistant Director, STEM, MA Department of Elementary & Secondary

Engineering Adventures in Afterschool

Time: 11:15am – 12:30pm | Room: Blue Level, Suite 22
Strand: K-12 Education

Why include engineering challenges in afterschool? Come experience an Engineering Adventures activity and learn how a quality engineering curriculum can engage your kids in teamwork, communication, and critical thinking while enabling them to engineer successful solutions to global problems. Engineering Adventures is an Out of School Time (OST) engineering curriculum designed specifically for grades 3-5. Children engaged in Engineering Adventures learn about technology and the engineering design process by engaging in activities that explore the materials, science concepts, and design principles of a particular challenge. Each unit culminates in an engineering showcase where children present their final designs to their peers. Preliminary research suggests that participation in Engineering Adventures leads to a greater understanding of the engineering design process and improved attitudes regarding possible future engineering careers.

HOSTS/MODERATORS

Michelle Dileso, B.S., Senior Curriculum Developer, Engineering is Elementary, Museum of Science

Owen Berliner, M.A., Senior Curriculum Developer, Engineering is Elementary, Museum of Science

Natacha Meyer, M.A., Curriculum Developer, Engineering is Elementary, Museum of Science

Examining the Intersection of the Standards for Math Content and Standards for Math Practices

Time: 11:15am – 12:30pm | Room: Red Level, Suite 16
Strand: K-12 Education

This session will focus on important mathematical content and help to clarify and recognize the Standards for Mathematical Practice in students' written work. We will engage with materials and model ways in which stronger classroom connections between content and practice can be made. Two such processes will be shared:

1. Unpacking the Rigor: We will examine a series of related tasks involving division of fractions and then discuss the Standards for Mathematical Practice(s) that we would expect to see when students complete each of the tasks.
2. Examining Student Work: We will examine a set of student work samples from one of these tasks and identify evidence of the Standards for Mathematical Practice within the written work.

HOSTS/MODERATORS

Wendy Cleaves, M.Ed., Math Coordinator, Regional Science Resource Center, UMMS

Rick Last, M.Ed., Consultant, Regional Science Resource Center, UMMS

Global Connections in Science

Time: 11:15am – 12:30pm | Room: Red Level, Suite 69
Strand: Digital Education

The Next Generation Science Standards (NGSS), already adopted by eight states and on the way to becoming the benchmark for science education across the nation, call for a fundamental shift in STEM education. The NGSS will require new instructional strategies that dig deeply into curriculum, establish and enhance scientific practices, and develop cross-cutting concepts over time. Teachers in Next-Gen science classrooms need a blueprint that result in students who can "do" science, not just "learn" science. Of critical importance is the need for students to recognize global issues that challenge science, investigate ongoing efforts to meet those challenges, and discover the opportunities that lie ahead.

This session will focus on how digital resources, framed around global issues, can engage middle and high school students in scientific practices, promote critical thinking, and improve scientific literacy skills. Discover, from some world-class experts, how students have opportunities to collect and share data with others around the world, while gaining a global perspective on scientific issues. Highlighted resources connect curricula across disciplines, providing opportunity for students to bridge traditional STEM subjects with social, political and economic concerns.

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HOST/MODERATOR

Kim Spangenberg, M.S., Manager of STEM,
The Virtual High School

PRESENTERS/PANELISTS

Dan Barstow, M.Ed., Development Director (former President,
Challenger Center for Space Education), The Virtual High School

Tamara Ledley, Ph.D., Senior Scientist, Chair of the Center for
Science Teaching and Learning, TERC

Tony Murphy, Ph.D., UCP Program Director, GLOBE, University
Corporation for Atmospheric Research

Natalie Macke, M.S., Science Teacher, NOAA Climate Steward,
Pascack Hills High School, NJ

GO PUBLIC: Conversation with Student STEM Majors at MA Public Colleges and Universities – Session 1

Time: 11:15am – 12:30pm | Room: Red Level, Suite 68
Strand: STEM Students – GO PUBLIC!

Massachusetts public colleges and universities now educate more than two-thirds of the high school students who attend college in state. In fact, the public higher education system will play the leading role in educating the state's future STEM workforce as 9 out of every 10 students from the public system remain in the Commonwealth after graduation pursuing careers or further study. In this interactive session, participants will engage with STEM students from UMass, state universities and community colleges about their choice of majors, research opportunities, and the current state of STEM teaching and learning on public campuses. This session will be hosted by Massachusetts Commissioner of Higher Education Richard M. Freeland.

HOST/MODERATOR

Richard M. Freeland, Ph.D., Commissioner of Higher Education,
Massachusetts Department of Higher Education

MA State STEM Plan 2.0: Discussion and Implementation Strategies

Time: 11:15am – 12:30pm | Room: West Club: Atrium
Strand: STEM Plan 2.0

This session is the second in a series of sessions to explore the MA state STEM Plan. Participants will discuss the updated goals in STEM Plan 2.0 and share implementation strategies to meet goal benchmarks. Participants will be broken into small groups by goal. Each discussion group will include people who contributed to updating the goal. The discussion will deepen as the groups share ways to meet targeted benchmarks and provide ideas about what support the community may need to meet the six goals.

HOSTS/MODERATORS

Allison Scheff, Executive Director, STEM, MA Department of
Higher Education

Lance Hartford, Executive Director, MassBioEd Foundation

Isa Zimmerman, Principal, IKZ Advisors, LLC

Middle and High School Students Demonstrate Computer Science Success Stories

Time: 11:15am – 12:30pm | Room: Red Level, Suite 15
Strand: K-12 Education

Computer Science interest soars when students are introduced to concepts early. Countries such as England, Israel, China, and Vietnam are introducing CS in grades k-12. Learn how CS education has impacted students in schools across Massachusetts. Students in five schools will describe what they have learned in their CS class; express how CS has impacted them and why they feel that CS education is important in preparing them for their future. Projects presented reflect each student's creativity, problem solving and computational thinking abilities. In addition to becoming inspired innovators through their early exposure, students share their views of how CS can benefit all students in every aspect. Leave this session inspired to seek ways to introduce CS in both your middle school and high school programs. Our country's national security, work force, and ability to lead in innovation depend on it!

HOSTS/MODERATORS

Kelly Powers, M.A.T./M.I.S., Department Chair, Computer Science
Grade 6-12 CS Teacher, Advanced Math & Science Academy
Charter School

Elaine Mistretta, M.Ed., Math, Computer Science & Robotics
Teacher, Rockport High School

David Petty, Teacher, Technology/Engineering Coordinator,
STEM Coordinator; Winchester High School

PRESENTERS/PANELISTS

**Students from the Advanced Math & Science Academy Charter
School, Malden High School, and Winchester High School**

Pathways to STEM Careers: Aligning Industry, Educators and Parents to Raise Student Awareness

Time: 11:15am – 12:30pm
Room: Blue Level, EMC Exec Center, Super Suite
Strand: STEM Career Awareness

Strong partnerships and alignment between industry leaders, educators, parents and students are critical to preparing middle school and high school students for a wide range of careers in STEM. This session will provide an interactive discussion that highlights how different organizations are working together to raise awareness of STEM workforce requirements along with

► MORNING SESSION II

innovative approaches to engaging in student STEM achievement — all with a common goal of preparing students for college and careers in the highly rewarding STEM fields.

HOST/MODERATOR

Stephanie Lee, M.S., Regional Director Government Affairs, Verizon

PRESENTERS/PANELISTS

Marie DeMego, B.A., Vice President of Enterprise Solutions, ConnectEDU (YourPlanForTheFuture.org)
Sheila Harrity, Ed.D., Principal, Worcester Technical High School
Anne McGrath, B.A., Program Manager, Science Competitions & Education Relations Manager, Massachusetts, Intel
Robert Gadbois, M.Ed., Academy of Engineering Coordinator, New Bedford High School Career Academy
Jordan Cox, Ph.D., FIRST Program Manager, PTC Inc.

Putting the “M” in STEM

Time: 11:15am – 12:30pm | Room: Red Level, Suite 22
Strand: K-12 Education

This session highlights professional development courses that fully integrate the mathematics of science through the science lenses of The Mathematics of Force and Motion and the Mathematics of the Engineering Design Process. The partnership among Lesley University, The Boston Museum of Science and the Brockton and Quincy Public Schools has brought together scientist and science educators with mathematicians and mathematic educators. When teaching, for example, the Algebra I and Ratio and Proportional Reasoning courses, teacher participants journeyed to the MOS to actively engage in the process of doing science while representing that science through mathematics. We will share via pictures, video, and verbal descriptions the interactive engagement of the teacher participants as they interacted with the mathematics of science. Participants will walk away with a blueprint of how educators in two different disciplines can overcome barriers and collaborate on the development and instruction of courses that cross into both science and mathematics.

HOST/MODERATOR

Yolanda Neville, M.Ed., Program Manager, STEM Division, Lesley University

PRESENTERS/PANELISTS

Dr. Anne M. Collins, Ph.D., Director of Math Programs, Lesley University
Stephen Yurek, M.A., Associate Director of Math Center, Lesley University

Research-Based STEM Resources: Closing the Gap between Researchers and Practitioners

Time: 11:15am – 12:30pm | Room: Red Level, Suite 70
Strand: Research to Practice

This session focuses on STEM research and practice by highlighting effective researcher/practitioner collaborations. Participants from diverse exemplary projects will characterize how they collaborate to develop research-vetted STEM resources and technologies. Researchers and developers will describe their projects, and selected PreK-12 educators will share how their critical problems of practice inform the development of new instructional and assessment materials. If you are a researcher, come to learn more about engaging practitioners in the design and implementation of your project. If you are a school or district educator, come to learn about new middle and high school resources, and how you can be involved in future development efforts. The session will have an interactive format, and written materials on each showcased project will be distributed. Participants will be able to talk informally with practitioner-researcher teams from projects from a variety of institutions.

HOST/MODERATOR

Barbara Brauner Berns, M.A., Managing Project Director and Co-PI, Research and Practice Collaboratory, Education Development Center, Inc.

PRESENTERS/PANELISTS

Joshua Sheldon, M.E., Research Project Manager, MIT Scheller Teacher Education Program
Michael Murray, M.A.T., Biology Teacher, Adjunct Professor; Pembroke High School; Massasoit Community College
Leslie Schneider, Ph.D., Research Manager, Tufts University
Gary Garber, M.A., Instructor, Boston University Academy
Janice Gobert, Ph.D., Associate Professor, Worcester Polytechnic Institute
Kathleen Scibelli, M.Ed., Science Teacher, Science Lead Teacher, Oak Middle School, Shrewsbury, MA
Charlotte Dowd, M.S., Director, Northeast School Partnerships, Agile Mind
Jessica Johnson, M.S., Math Teacher, High School of Science & Technology, Springfield Public Schools

STEM Innovation and Entrepreneurship (Morning Session)

Time: 11:15am – 12:30pm | Room: Red Level, Suite 72
Strand: Youth Innovators & Entrepreneurs

New, this year, the MA STEM Summit will seek to have an interactive discussion on the importance of STEM in innovation and entrepreneurship. Panelists of students, professors and

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practitioners will lead a conversation on hands on education and competitions, pre-college through graduate school to nurture a culture of innovation and entrepreneurs in the Commonwealth.

HOST/MODERATOR

Raji Patel, S.M., Co-Director, MA Space Grant (NASA) Consortium, MIT

PRESENTERS/PANELISTS

Rajendra Melville, Ph.D., Executive Director, Deshpande Foundation

Merredith Portsmore, Ph.D., Associate Director, Center for Engineering Education and Outreach, Tufts University

Dipul Patel, Graduate Student, Manager, MIT 100K, MIT, Sloan School

Steven L. Rawding, B.S., Aviation Planner / RWDC State Coordinator, MassDOT

STEM Pathways from Secondary through Post-secondary Education

Time: 11:15am – 12:30pm | Room: Blue Level, Suite 19
Strand: Community College

Recent efforts from across the state to bring best practices to scale through the Department of Higher Education, including @Scale, STEM Academies, and Guided Pathways to Success in STEM Careers, have generated significant success. The panelists will describe pathways in partnership with and along the post-secondary continuum that lead to STEM careers. Specific examples will include outreach efforts, innovative student support services, college readiness and college-level programming for high school students, as well STEM certificates and degrees that lead directly to careers in a STEM field or further education at four-year institutions.

HOST/MODERATOR

David Cedrone, M.B.A., M.Ed., Associate Commissioner for Economic and Workforce Development, MA Department of Higher Education

PRESENTERS/PANELISTS

Carol King, M.Ed., Director of College and Career Pathways, Quinsigamond Community College

Sarmad Saman, Ph.D., Dean of Math, Science and Engineering, Bristol Community College

Patrice Lincoln, M.B.A., Dean of Access and Transitions, Mt. Wachusett Community College

STEM Sprouts in Preschool: How Museums, Libraries & Public Broadcasters Support Early STEM Education

Time: 11:15am – 12:30pm | Room: West Club: Lounge 1
Strand: Early Childhood Education

Astronomer Amy Mainzer surveyed her scientist and engineer colleagues, asking them a simple question: “When did you first decide that you wanted to be a scientist?” Overwhelmingly, their response was: before they were 10 years old! The Commonwealth understands that in order to create the next generation of scientists and engineers we need to focus on our youngest citizens, encouraging them to explore the science and math of everyday life — both because it’s fun and rewarding and because it gives children the skills they need to succeed in school. Join the Boston Children’s Museum, the Norfolk Public Library, and the WGBH Educational Foundation for a hands-on session that will showcase the Commonwealth’s investment in early childhood STEM education from interactive museum activity kits to a new digital STEM curriculum for center-based and family childcare settings to family events at public libraries. Participants will receive a STEM-themed children’s picture book and a magnifying glass.

HOST/MODERATOR

Eric Lieberman, B.S., Educator/Provider Specialist, MA Department of Early Education and Care

PRESENTERS/PANELISTS

Mary Haggerty, M.A., Director of Media Engagement, WGBH Educational Foundation

Beth Fredericks, M.Ed., Director, Museums/Libraries Project, Boston Children’s Museum

Connie Jones, B.S. Ed., Early Childhood Resource Center Coordinator, Norfolk Public Library

Tying College to STEM Careers: MA Community Colleges & Workforce Development Transformation Agenda

Time: 11:15am – 12:30pm | Room: Blue Level, Suite 20
Strand: Community College, Workforce Development

The Massachusetts Community Colleges, along with state and industry partners, are working to simplify college access for adult learners, accelerate learning, and create stronger ties between the colleges’ programs and jobs in the local labor market. This session will provide an overview of program strategies and systemic changes occurring statewide, supported by \$20 million from the Department of Labor TAACCCT Program. Panelists will illustrate current community college strategies to accelerate STEM-related training through educational innovations such as stackable credentials, contextualized curriculum, modified program delivery (accelerated, hybrid, online) and more. Three programs of the Transformation Agenda will be used to illustrate how these strategies are applied to accelerate student progress to certificates

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and degrees in STEM fields. The programs include Clinical Lab Assistant and Medical Lab Technician at Middlesex Community College, Applied Manufacturing at Berkshire Community College, and Health Information Technology at Bunker Hill.

HOST/MODERATOR

Jennifer Freeman, M.P.A., Project Manager, MA Community Colleges & Workforce Development Transformation Agenda

PRESENTERS/PANELISTS

William Mulholland, M.B.A., Vice President for Community Education and Workforce Development, Berkshire Community College

Donna Akerley-Procopio, M.Ed., Professor, Computer Information Technology Department, Bunker Hill Community College

Kathleen Sweeney, Ed.D., Dean, Health & STEM, Middlesex Community College

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Afterschool and Out-of-School Time Roundtable Discussion

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 20
Strand: Research to Practice

After-school and OST programs are excellent venues to introduce and explore STEM subjects and excite students (and staff) about engaging in the fields of math, engineering, science and technology. An inquiry-based program can help reinforce skills learned in school, build problem solving abilities, and provide hands-on, fun activities that can engage even the most reluctant learners. Our goal is to take the fear out of STEM and encourage children, youth and our young staff members to consider pursuing careers in the STEM fields.

This interactive roundtable session will focus on some of the “whys and ways” of including STEM programming in after-school, camp and OST programs. Discussions will include summer learning loss and programming, professional development ideas, best practices, regional STEM networks, and 21st Century Grants. Please come and share your thoughts, questions and experiences in engaging children and youth in the new STEM frontiers.

HOSTS/MODERATORS

Sarah Montoya, B.A., Early Education and Care Specialist, The Institute For Education And Professional Development

PRESENTERS/PANELISTS

Kim Audette, M.Ed., Coordinator OST Initiative, EEC Educator/ Provider Support Program, Preschool Enrichment Team

Robert French, Ph.D., Director of Policy & Program Development, NorthStar Learning Centers, New Bedford, MA

Katie Magrane, Executive Director, Massachusetts Afterschool Partnership

Kristen McKinnon, M.S., M.P.A., Service-Learning and Out-of-School Time Specialist, MA Department of Elementary & Secondary Education

Karyl Resnick, M.Ed., Coordinator, 21st Century Community Learning Centers Program, MA Department of Elementary & Secondary Education

John Swanson, J.D., Policy Analyst, MA Department of Early Education and Care

Developing the Child’s Interest in STEM: Moving from Theory into Practice

Time: 2:30pm – 3:45pm | Room: West Club: Lounge 1
Strand: Early Childhood Education

This Strand will focus on three programs and the paths they have taken towards helping children develop interest in STEM concepts and, through discovery science, learn about the world around them. The programs will share their STEM projects, events, goals and practices, and the moderator will open discussion up for participants to ask questions about their presentation and discuss with the presenters emergent topics associated with STEM instruction with preschool children as well as other topics, such as professional development and curriculum. For example, Greater Lawrence Head Start Program will share how the topic of Bridges was intentionally chosen for its general scientific, technological, mathematical and engineering concepts for their children to discover. Bridges serve a purpose in our communities. In their STEM — Bridges integrated unit, children began to investigate physics and engineering as they designed and built different structures. Children studied the different types of bridges,

▶ AFTERNOON SESSION

including the arch, beam, suspension, and truss type bridges. Viewing the attributes of the bridges in Lawrence, they developed new vocabulary and concepts in comparisons of measurement, a variety of materials for building, balance, and line. Their display will consist of children's artifacts, digital display and display boards. This presentation will provide an interesting interactive and informative session for Early Education and Care participants.

HOST/MODERATOR

Jody Figuerido, Ph.D., STRAND Facilitator, Director of The Institute for Education and Professional Development

PRESENTERS/PANELISTS

Anne D'Errico, M.B.A., Head Start Director, Greater Lawrence Head Start Program

Dr. Patricia Howson, Ph.D., STEM Education Consultant, Merrimack College

Tara Fitzgibbons, B.A., Education Manager, Greater Lawrence Head Start Program

Angela Amenta, A.A., Lead Teacher, Greater Lawrence Head Start Program

Dianne Bardsley, B.A., CEO, Markman Children's Programs, Inc.

Debra Roux, A.A., School Age Coordinator, Markman Children's Programs, Inc.

Debra Garvin, B.A., Preschool Coordinator, Markman Children's Programs, Inc.

Kathy D'Agostino, B.A. in progress, Family Child Care Provider, Kathy's Family Child Care and Preschool

Digital Games for STEM Education

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 69
Strand: Digital Education

The lack of students qualified for and pursuing STEM based careers suggests that traditional approaches to STEM education are not always effective. Game-based learning is an innovative practice that can provide exciting opportunities for students to develop core STEM content skills as well as explore the processes of science, engineering and computational thinking. Game-based models engage students in an environment they enjoy and provide entertaining opportunities to investigate STEM concepts. These STEM games are research based, easy to access, and often freely available for use within and beyond the classroom.

This session will focus on the role of games in STEM education, will spotlight specific educational games and the research that supports them, and will highlight opportunities to participate in Massachusetts based gaming initiatives.

HOST/MODERATOR

Kim Spangenberg, M.S., Manager of STEM, The Virtual High School

PRESENTERS/PANELISTS

Teon Edwards, M.Ed., Lead Game Designer, TERC

Susannah Gordon-Messer, Ph.D., Education Content Manager, The Education Arcade, MIT

Scot Osterweil, B.A., Creative Director, Learning Games Network

Bert Snow, B.A., Vice President of Design and Content, Muzzy Lane

Giving Job Seekers a Boost to the First Rung of the STEM Career Ladder

Time: 2:30pm – 3:45pm | Room: Blue Level, Suite 19
Strand: Community Colleges, Workforce Development

To compete in today's work environment and rapidly changing economy Massachusetts' emerging and incumbent workers need support to develop sufficient literacy and numeracy skills. Beginning with an overview of where the STEM jobs are, this session will help professionals in the fields of education, adult basic education, and workforce development understand ways to boost the educational level of older youth/adults lacking the necessary math and science skills needed to enter into STEM employment or post-secondary education. Panelists in this session will present current initiatives, including accelerated/high intensity programming to bridge the gap between workers in need of good jobs and employers in need of skilled entry level workers. These leaders from local community colleges, college and career navigators, workforce development WorkKeys programs, and contextualized developmental education programs will provide information and best practices that offer job seekers a boost to the first rung of the career ladder.

HOST/MODERATOR

Meelynn Wong, J.D., Associate Director, Metro North Regional Employment Board

PRESENTERS/PANELISTS

Kevin Forgard, M.S., Instructional Designer, Bristol Community College

Jennifer James Price, M.A., Undersecretary, Executive Office of Labor & Workforce Development

Tom Mechem, B.A., GED State Chief Examiner, Adult and Community Learning Services, MA Department of Elementary and Secondary Education

Ana Sanchez, B.S., Career and Course Development Officer, STCC

GO PUBLIC: Conversation with Student STEM Majors at MA Public Colleges and Universities – Session 2

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 68
Strand: STEM Students – GO PUBLIC!

Massachusetts public colleges and universities now educate more than two-thirds of the high school students who attend college in state. In fact, the public higher education system will play the leading role in educating the state's future STEM workforce as

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9 out of every 10 students from the public system remain in the Commonwealth after graduation pursuing careers or further study. In this interactive session, participants will engage with STEM students from UMass, state universities and community colleges about their choice of majors, research opportunities, and the current state of STEM teaching and learning on public campuses.

HOST/MODERATOR

Christine Williams, J.D., Assistant Director, Workforce Development, MA Department of Higher Education

Higher Education Partnerships through the Continuum: K-12, Colleges and into STEM Workforce

Time: 2:30pm – 3:45pm | Room: Red Level, Super Box
Strand: Higher Ed (BA/BS+)

We are delving into the motivations and rewards for a variety of Massachusetts stakeholders to create and sustain programs that address the workforce and education needs of the Commonwealth. The panelists come from a variety of settings, diverse geographical areas, and organizations; however, they are all focused on how to propel students from K-12 schools, two- and four-year institutions, and create a technologically literate population, some of which are ready and inspired to join our technical workforce. The panel represents a mix of stakeholders from community colleges, four-year institutions, corporations and philanthropic and extramural funding organizations. They have all demonstrated a commitment to this continuum approach by dedicating resources and leadership to support their mission. We will first briefly share our programmatic efforts and results and then engage the audience in an interactive way so we can all learn about best practices and unmet needs. Please join us as we have a conversation about sustained inspiration and preparation of our students through education and into the workforce.

HOSTS/MODERATORS

Dr. Susan Bronstein, Ed.D., Program Director, ABLE4STEM, University of Massachusetts

PRESENTERS/PANELISTS

Dr. Robert Cody, Ph.D., Dean, Science, Technology, Mathematics, Business and Workforce Education, Cape Cod Community College

Dr. Ann Coles, Ed.D., Senior Fellow, College Access Programs, uAspire

Terri Munson, B.S., Stand and Deliver Mentoring Program Coordinator, Raytheon

Dr. Gretchen Fougere, Ph.D., Assistant Dean of Outreach and Diversity, College of Engineering, Boston University

Higher Education and Industry Partnerships for Career Awareness

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 22
Strand: STEM Career Awareness

Unique industry and higher education institution partnerships that facilitate STEM career awareness, afford internships in STEM disciplines, and work to close the expectation gap between the higher education community and STEM-related businesses.

HOST/MODERATOR

Michael Goodman, Ph.D., Associate Professor and Chair Department of Public Policy UMASS Dartmouth, Advanced Manufacturing Regional Partnership Academy

PRESENTERS/PANELISTS

Chris McCarroll, Ph.D., Technical Director, Seapower Capability Systems; Raytheon Co, Raytheon/UMASS Lowell Emerging Technologies and Innovation Center

Paul Vigeant, M.P.A., Assistant Chancellor for Economic Development; UMASS Dartmouth, UMASS Dartmouth Advanced Technologies and Manufacturing Center

David Cruise, M.Ed., Director, Business and Employer Services; Regional Employment Board of Hamden County, Precision Manufacturing Regional Alliance Project

Kelsey Abbruzzese, M.S., Communications Director; MassDevelopment, Amp it Up

Integrated STEM Curriculum and Teaching

Time: 2:30pm – 3:45pm | Room: West Club: Lounge 2
Strand: K-12 Education

In this hands-on workshop, participants will work collaboratively to explore integrated STEM education best practices. The workshop will include small break-out activities and a panel of educators who actively implement integrated STEM education. By participating in this session, you will have the opportunity to connect with your peers and share ideas, learn from practitioners in the field, and walk away with integrated STEM curriculum and teaching resources.

HOST/MODERATOR

Ayora Berry, M.Ed., Program Manager, STEM Certificate & Creativity Lab, PTC Inc.

PRESENTERS/PANELISTS

Rachel Usher, M.Ed., Teacher, Douglas Public Schools

Stephen Chinosi, M.A., Chief Innovation Officer, Newton Public Schools

Alyssa Walker, M.Ed., Professional Development Coordinator, FSU Christa McAuliffe Center

Introduction to the Science and Engineering Practices

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 16
Strand: K-12 Education

The newly released Massachusetts Science and Technology/Engineering Curriculum Framework emphasizes science and engineering practices:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

In this session, participants will engage in a hands-on activity to illustrate the nature of these practices and to begin to think about how these practices can be incorporated into science and technology instruction.

HOST/MODERATOR

Marilyn Decker, M.A.T., Director, Office of Science, Technology/Engineering & Mathematics, MA Department of Elementary & Secondary Education

MA State STEM Plan 2.0: Contextualized Conversations

Time: 2:30pm – 3:45pm | Room: West Club: Atrium
Strand: STEM Plan 2.0

This third session in the STEM Plan series will bring together people with similar interests and concerns to discuss how the plan can support the work that is already being done within that arena, how that work can be used to advance the goals of STEM, and what additional work is needed. Small groups will meet according to participant interests. Topics include: STEM and the arts, computer science, technology, diversity, serving special needs and ELL students, STEM literacy, industry/workforce needs, informal science, and out-of-school programming.

HOSTS/MODERATORS

Allison Scheff, Executive Director, STEM, MA Department of Higher Education

Lance Hartford, Executive Director, MassBioEd Foundation

Isa Zimmerman, Principal, IKZ Advisors, LLC

Model Curriculum Units as Key Resources for STEM Implementation

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 21
Strand: K-12 Education

Districts across Massachusetts are revising and developing curriculum aligned to the 2011 Mathematics Curriculum Framework and will be doing so for upcoming revised science standards. Through the state's Race to the Top grant over 60 districts have collaborated to develop Model Curriculum Units in core academic subject areas, including STEM. Participants in this session will receive an overview of the Model Curriculum project, the Understanding by Design process, key features of the units, and an in-depth look at sample math units. Participants may then use the units in classrooms, adapt them, or use them as a reference for local curriculum development work.

PRESENTER/PANELIST

Anne Marie Condike, M.Ed., Model Curriculum Project Lead, MA Department of Elementary and Secondary Education

STEM Innovation and Entrepreneurship (Afternoon Session)

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 72
Strand: Youth Innovators & Entrepreneurs

New, this year, the MA STEM Summit will seek to have an interactive discussion on the importance of STEM in innovation and entrepreneurship. In the afternoon, a panel of students and practitioners will participate in a lively conversation about the impact that early involvement in K-12 educational hands-on competition and scientific and technical exploration has had on their future interest in innovation and entrepreneurship in the Commonwealth.

HOST/MODERATOR

Jennifer Keller Jackson, B.A., Senior Program Officer, NCIIA

PRESENTERS/PANELISTS

Jason Morrella, B.A., President, Robotics Education & Competition Foundation

Barnas Monteith, B.S., Chairman of the Board, Massachusetts State Science & Engineering Fair

Greg Carlson, Student, Worcester Technical High School

Ingrid Marko, Student, Worcester Polytechnic Institute

Using Engineering Practices to Bridge the STEM Gap

Time: 2:30pm – 3:45pm | Room: Red Level, Suite 15
Strand: K-12 Education

With the focus on engineering practices and principles in the state's Science and Technology/Engineering Standards and in the Next Generation Science Standards, educators across the United States are preparing to teach more of the "E" in STEM. Luckily, engineering activities provide opportunities to integrate many other disciplines, including science, mathematics, language arts, and social studies. This session will focus on engineering as the unifying link between several disciplines. Participants in this session will take the classic challenge of engineering a bridge and elevate it to an integrated, authentic STEM learning experience. After learning about a real-life engineering problem that requires a bridge as a solution, participants will work in teams to design a bridge that meets specific design criteria. Participants will then use this experience as a springboard for brainstorming questions about structures, forces, balance, and stability that, in turn, help them to learn science content as well as improve and redesign their bridges. From the questions generated, participants will develop an inquiry-based science activity appropriate for young learners. To conclude the session, we will connect participants' experiences with the engineering practices and principles and introduce a planning template that participants can use to create this sort of integrated STEM activity in their own classrooms.

HOST/MODERATOR

Chantal Balesdent, Ph.D., Professional Development Provider, Engineering is Elementary, Museum of Science

Where the STEM Jobs Are

Time: 2:30pm – 3:45pm
Room: Blue Level, EMC Exec Center, Super Suite
Strand: Workforce Development

A presentation outlining the STEM occupational landscape and trends for Massachusetts, utilizing a variety of Labor Market Informational tools, including Wanted Analytics/Help Wanted On-Line (HWOL), US Bureau of Labor Statistics (BLS), and State LMI data correlated to actual and expected college degree output. Participants will be shown where they can access the regional data for their own future use. We will also highlight the shared access and use of the Wanted Analytics/HWOL by all public community colleges, state universities, workforce boards, career centers, and the MA Department of Higher Education.

HOSTS/MODERATORS

Dale Allen, Ph.D., Vice President for Community Engagement, Quinsigamond Community College

PRESENTERS/PANELISTS

Beth Ashman, M.C.P., Workforce Research Specialist, MA Department of Higher Education

Michael Baines, B.A., Project Manager, Franklin Hampshire Regional Employment Board

Tom Thacher, M.S., Data Analysis and Training Manager, Career Point

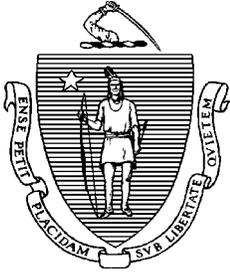
Resource Room Exhibits

The Resource Room is located in the East Atrium. Full exhibit descriptions are available online at: www.mass-stem-summit.org

STRAND	BOOTH	ORGANIZATION/PROGRAM	DESCRIPTION
Early Childhood	1	Resources for Early Learning; Next Generation Preschool Math; PBS LearningMedia™; NOVA Education. WGBH: STEM Summit Media Partner	Free online platform featuring a centralized library of digital resources for preschool classrooms and family childcare providers; digital math content for the pre-school classroom; strategies, tools, and professional development resources to enable educators to fully utilize digital learning, and; multi-media educational resources
	2	STEM Enrichment Activities Berkshire County Head Start	Improving STEM and STEAM education in partnership with community agencies and cultural venues
	3	Boston K1DS and Thrive in 5 @scale Boston Public Schools	High-quality network of early childhood classrooms to close the achievement gap by strengthening Pre-K mathematics teaching and learning
	4	STEM Education in a Family Child Care Program Kathy's House Family Child Care & Preschool	STEM Education in a Family Child Care Program
	5	"Watch us Become Civil Engineers" Greater Lawrence Community Action Council, Inc. Head Start Program	Bridge-building STEM adventure for preschoolers
	6	STEM in the Summer Markman Children's Programs, Inc.	DESE Quality Grant-funded curriculum ideas and materials
	7	STEM in a Preschool Setting Sharon Cooperative School	Science and math-related games, manipulatives, projects, and demonstrations
	8	Springboard Education in America Springboard School	A cross-curricular look at hatching chicks
	9	STEM in a Preschool Setting Winthrop Children's Corner Preschool	Hank's Bank and other adventures
K-12 Education, Youth Innovators & Entrepreneurs	10	STEAM Expo Canton School District	Information on holding a STEAM Expo for pre-K – 12 students along with sample projects
	11	Club Invention	Camp Invention – nurturing a child's curiosity into big ideas
	12	Peer Mentoring West Brookfield Elementary Innovation School	STEAM-focused Peer Mentoring of Kindergarten students by sixth graders
	13	"e" Inc.	Hands-on environmental activities and civic engagement ideas and skills that encourage youth leadership for the planet

STRAND	BOOTH	ORGANIZATION/PROGRAM	DESCRIPTION
K-12 Education, Youth Innovators & Entrepreneurs	14	FIRST Program For Inspiration and Recognition of Science and Technology	Helping young people discover and develop a passion for science, engineering, technology, and mathematics
	15	Green Schools and Green Scholars Programs Manchester Essex Regional School District (MERSD)	Environmental education and opportunities for K-12 students, educators and schools and Empowering student-entrepreneurial leaders equipped to face 21st century environmental challenges through Project Based Learning in collaboration with community partners and Project Adventure
	16	Einstein and the Relativity of Bees; Inventors Fair, and; Jack's Robot" Mansfield Public Schools	Fostering invention and innovation in a public school setting
	17	STEM Solar Lab	Motivating and inspiring students through hands on learning and provide teachers with the professional development they need to make this happen in their classrooms
	18 @scale	Zero Robotics Massachusetts Afterschool Partnership (MAP)	Programming competition where the robots are SPHERES satellites inside the International Space Station
	19	Clean Energy and the Commonwealth's STE Curriculum Framework Massachusetts Department of Energy Resources (DOER)	Clean Energy and the Commonwealth's STE Curriculum Framework
	20	Real World Design Challenge (RWDC) Massachusetts Department of Transportation	Annual competition providing high school students with real world engineering challenges in a team environment
	21	Massachusetts State Science and Engineering Fair, Inc. (MSSEF)	High school students presenting research projects in STEM
	22	Mini-STEM Expos Plainville Public Schools	Students addressing real-world problems through the sharing of ideas, planning, and testing
	Center of Room	Robotics Education & Competition (REC) Foundation	Hands-on, sustainable, and affordable curriculum-based robotics engineering programs
	23 @scale	DIGITS	STEM education programs for 6th graders
	24 @scale	Science from Scientist	Bringing real, charismatic scientists into classrooms to teach hands-on, frameworks-relevant STEM lessons
	25 @scale	Project Lead the Way & Inq-ITS Worcester Polytechnic Institute	Project-based STEM K-12 curriculum, and an online education tool that helps middle school students learn scientific critical thinking skills
	26	Veterinary Assisting Program Worcester Technical High School (WTHS)	Partnership with the Cummings School of Veterinary Medicine at Tufts University: providing practical job skills to WTHS veterinary assisting students and Tufts University Doctor of Veterinary Medicine students by providing veterinary care to companion animals
	27	Amgen Biotech Experience (ABE) EDC	Research-grade equipment, supplies, curriculum, professional development for middle and high schools

STRAND	BOOTH	ORGANIZATION/PROGRAM	DESCRIPTION
Higher Education	28 @scale	ABLE4STEM	Comprehensive approach to recruiting and retaining community college students interested in pursuing 4-year degrees in STEM disciplines
	29 @scale	STEM Pathways Project & STEM Academy Massachusetts College of Liberal Arts (MCLA)	Supporting undergraduates engaged in STEM coursework
	30	National Collegiate Inventors and Innovators Alliance (NCIAA)	Supporting technology innovation and entrepreneurship in higher education to create experiential learning opportunities for students
	31	InterLACE Tufts University Center for Engineering Education and Outreach (CEEEO)	Innovative web-based learning environment that supports a broad range of collaborative activities and the development of science practices defined by the Next Generation Science Standards
	32	Merrimack Valley Sandbox	Connecting and convening, spreading the entrepreneurial mindset, developing socially responsible leadership, and facilitating business creation
	Center of Room	MassBay Community College	STEM learning that extends beyond the classroom. Exhibit includes a student-built submersible and supercomputer
Workforce Development and Careers in STEM	33	Skilled Careers in Life Sciences (SCILS) Initiative Boston Private Industry Council (PIC)	Skilled Careers in Life Sciences (SCILS) Initiative
	34 @scale	STEMPower Workforce Development Network Central MA Workforce Investment Board (WIB)	Connecting with your local Workforce Investment Board and Career Center for STEM career services
	35	Manufacturing Skills Academy Network (MSAN) Manufacturing Advancement Center Workforce Innovation Collaborative	Developing 21st century manufacturing talent
	36 @scale	MA STEM Sox Massachusetts Council of STEM Professional Societies	Developing equitable, exciting STEM education environment, increasing STEM workforce diversity, and promoting scientifically literate public
	37	Future City Competition Boston Society of Civil Engineers Section (BSCES)	Experiential learning design competition for 6th to 8th graders run by the National Engineers Week (DISCOVER e)
37	AMP it Up! MassDevelopment	Educating, preparing, and exciting the next generation of workers in advanced manufacturing	
GO PUBLIC!	38	MA Department of Higher Education	State Higher Education STEM Initiatives
Evaluation	39	A Program Director's Guide to Evaluating STEM Education Programs	Lessons learned from local, state, and national initiatives



OFFICE OF THE GOVERNOR
COMMONWEALTH OF MASSACHUSETTS
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DEVAL L. PATRICK
GOVERNOR

November 2013

Dear Members of the STEM Community:

On behalf of the Commonwealth of Massachusetts and the Governor's STEM Advisory Council, I welcome you to the 10th Annual Massachusetts STEM Summit.

In 2010, STEM Plan 1.0, *A Foundation for the Future: Massachusetts' Plan for Excellence in STEM Education* created a STEM Pipeline infrastructure that became the envy of the nation. I am excited to say the second version of this plan, *Expanding the Pipeline for All*, will maintain the momentum generated in the first while providing an increased focus on equity thus ensuring every student in Commonwealth has access to first class STEM education.

The STEM Summit provides an opportunity for all members of the STEM Community to take one day out of the year to celebrate its successes and to strengthen the pipeline. The schools, businesses, agencies and organizations you represent that translate the goals of the STEM plan into reality. Because of you, Massachusetts is ranked first in the nation for mathematics and science education, and has a strong innovation economy that is primed to grow. STEM education is a civic obligation and an economic need. I thank you for your efforts to push forward on everything STEM.

I hope you enjoy today's STEM Summit, learn innovative strategies and make new connections. Together, we will be able to expand the STEM pipeline for all.

Best regards,

A handwritten signature in black ink, appearing to read "Deval Patrick". The signature is fluid and cursive, with a large loop at the end.



November 13, 2013

Dear STEM Stakeholders:

What an exciting time for STEM in Massachusetts! On the tenth anniversary of the STEM Summit, there is much to celebrate: a nationally recognized STEM initiative; terrific support from the Governor and legislature; dynamic new leadership with Congressman Joe Kennedy assuming the Honorary Chairmanship of the Governor's STEM Advisory Council; and perhaps most importantly, quantifiable impacts on students and teachers throughout the Commonwealth.

Nothing captures that excitement better than the STEM Summit. On this day, in this terrific venue, we celebrate our successes and undertake the important work of moving forward. Through today's release of the new version of the state STEM Plan we have our blueprint. It is up to all of us to execute.

At the Massachusetts Business Roundtable, a public policy organization comprised of CEOs and senior executives from some of the state's largest employers, we are committed to that execution. We know that in order to remain competitive in a global economy, we must continue to invest in our greatest competitive advantage: talent. Regardless of industry, regardless of size, employers are looking for a pipeline of workers skilled in the STEM competencies.

In Massachusetts, there are 2.3 unemployed people for every one job, but only one person for every 2.1 STEM jobs. And these are good jobs. The average STEM salary is twice as much as the state's average salary. But here's the policy problem: There is a mismatch between projected future jobs requiring STEM skills and the projected supply of qualified workers to fill them. Investing to ensure a pipeline of workers skilled in STEM competencies is a workforce issue, an economic-development issue, and a business imperative. That is why we, in the business community, are involved.

None of this great success happens without you, the Massachusetts STEM community. Your advocacy and your work every day is inspiring, it is impactful, and it is what we celebrate today. On behalf of the Massachusetts Business Roundtable, thank you and we look forward to continuing to join with you in pushing this agenda ever forward.

Enjoy the day!

Sincerely,

A handwritten signature in black ink that reads "Donna C. Cupelo".

Donna C. Cupelo, Region President
Verizon New England
Chair, Massachusetts Business Roundtable

A handwritten signature in black ink that reads "JD Chesloff".

JD Chesloff
Executive Director

October 31, 2013

Dear STEM Colleagues,

The University of Massachusetts, including all five campuses, (Amherst, Boston, Dartmouth, Lowell and the Medical School), and the UMass Donahue Institute welcome you as sponsors to the 10th Annual Massachusetts STEM Summit. As the state's public university system, we are proud to invest in the future of the Commonwealth by continuing to support and provide a forum for innovation, collaboration and inspiration that directly affects present and future generations.

Today's college students are facing a shrinking job market, while at the same time the need to fill positions with highly educated and skilled workers is only increasing. Pursuing the rigors and rewards of a STEM education requires a particular level of focus, discipline and foresight that is to be admired, and we are especially proud of the 15,738 STEM majors that we awarded Bachelor's, Master's, and Doctoral Degrees and Certificates to last year. This represents a 50% increase in Bachelor's Degrees in STEM earned across the five campuses since 2007; and a 39% increase in STEM Certificates and Graduate Degrees since 2007.

Massachusetts public colleges and universities educate more than two-thirds of the high school students who attend college in the state. In fact, the public higher education system will play the leading role in educating the state's future STEM workforce as 9 out of every 10 students from the public system remain in the Commonwealth after graduation to pursue careers or further study. It has been an honor to support the organizations, educators, and students who will set the course for the next phase of the Commonwealth's future.

In a state that is home to many of the nation's most prestigious colleges and universities, the University of Massachusetts is the leading recipient of biotechnology patents. Our culture of innovation, respect for research, and investment in our students continues to pay off, and ten years after our first STEM Summit, we continue to believe in the talent of Massachusetts. We look forward to helping our students, teachers and businesses succeed for years to come.

Sincerely,



Robert L. Caret
President



November 13, 2013

Dear STEM Colleagues:

BATEC (Broadening Advanced Technological Education Connections) is pleased to support the 2013 Massachusetts STEM Summit celebrating ten years of statewide collaboration. The Summit is a critical convening opportunity for those of us working together to create a strong STEM education and workforce system for our state.

BATEC is the Center of Excellence for Computing and Information Technologies within the National Science Foundation's Advanced Technological Education program. We are working nationally to define, extend and strengthen computing and information technology pathways and career opportunities for urban students. Headquartered at University of Massachusetts Boston, we participate in and lead the national discussion on the subject of integrated curriculum and applied IT.

In Massachusetts, BATEC is changing IT education by encouraging educators and industry to support each other in meaningful collaboration. Curriculum development is authentic and centered around a team-based approach, with educators and industry partners working together to help students develop strong technical knowledge combined with critical thinking and higher-order analytical skills that will empower and advance them in today's workplace. College and Career Fairs connect students with higher education opportunities, admissions counseling and career information. Student Leadership Programs such as the Tech Know How Lab and BATEC Ambassadors are developing the employability skills needed for future career pursuits. Dual Enrollment Courses are an opportunity for high school students experience college classes and receive course credit. The Tech Apprentice Program connects talented high school with paid technology-focused internships in local companies, while college students gain experience and provide real value for small businesses and high-tech start-ups. The Bridge to Community College Initiative connects underserved adults to the Community College system.

BATEC wishes to thank the Governor's STEM Advisory Council and all of the supporters of this event for their leadership in the quest to propel Massachusetts into a world class STEM leader. It is imperative that we all continue to work together to encourage more students to pursue careers in STEM fields and to provide them with the tools and resources they need to become the successful innovators of tomorrow.

Sincerely,

Dear STEM Leaders,

Through your enthusiasm, support and encouragement, thousands of students will experience the wonder of STEM. The knowledge you bring back to your classrooms and colleagues will spark ideas, questions and discussions that will enhance innovative science programming for students across Massachusetts.

In your school or classroom could be a future researcher, technical engineer or even a Nobel Prize winner. We have a collective responsibility to provide a variety of STEM pathways for students of all abilities, and to provide resources and support for STEM educators.

The Biogen Idec Foundation and the Biogen Idec Community Lab continue to focus on supporting programs that enhance high-quality STEM education for present and future generations. The Biogen Idec Community Lab is the longest running, corporate hands-on science lab in the nation where nearly 20,000 students in Greater Boston have experienced laboratory science over the last 11 years. The Community Lab science expertise, coupled with the Foundation's extensive grant program, has led to tremendous partnerships with the Museum of Science, Teach for America, Cambridge Science Festival, Citizen Schools and other local STEM initiatives over the years.

The Biogen Idec Foundation is excited to commemorate the 10th anniversary of the MA STEM Summit by launching the ***Ignite the Power of STEM*** Grant Program to support science education programs and projects in elementary, middle and high schools represented at the 2013 Summit. Details regarding this exciting grant program will be shared at today's event.

We appreciate the opportunity to participate in today's conference and value our continued partnership. I commend the Summit co-hosts, the Massachusetts Governor's STEM Advisory Council, the Massachusetts Business Roundtable and the University of Massachusetts Donahue Institute, for continued leadership in strengthening the state's STEM pipeline and encouraging youth to experience the exciting opportunities an education in STEM can provide.

Looking to the future, we will continue to pursue opportunities to interact with, educate and inspire the next generation of scientists and STEM leaders.

Sincerely,



Tony Kingsley
Chairman, Biogen Idec Foundation

November 13, 2013

Dear STEM Stakeholders,

The College Board is proud to be a sponsor of the Tenth Annual Massachusetts STEM Summit. We applaud the continuing work of the Governor's STEM Advisory Council to increase awareness, interest, and access for all students to critically important STEM career pathways and are pleased to be here again as part of that effort. We commend the Advisory Council, the Massachusetts Business Roundtable and the UMass Donahue Institute for their combined leadership on such an important endeavor.

The College Board's mission is to connect students to college success and opportunity. We are committed to increasing the number of students who earn a college degree and are prepared to succeed in the 21st century. Today's College Board works with middle schools, high schools, community colleges, four-year colleges, policymakers and state education agencies to achieve this mission.

Our Advanced Placement Program[®] enables willing and academically prepared students to pursue college-level studies while still in high school. Through AP[®] courses in 34 subjects including ten in STEM, each culminating in a rigorous exam, students learn to think critically, construct solid arguments and see many sides of an issue. In December 2012 we announced the AP[®] STEM Access program, created to increase the number of traditionally underrepresented minority and female high school students who participate in AP Program courses in STEM disciplines. A grant from Google, as part of its Global Impact Awards to DonorsChoose.org, made it possible for seventeen qualifying school districts across the Commonwealth of Massachusetts to start new AP math and science courses and to encourage traditionally underrepresented minority and female students who demonstrate strong academic potential to enroll and explore these areas of study and related careers.

In 2013 over 42,000 Massachusetts public high school students took at least one AP Exam, and thousands of Massachusetts educators have benefited from our high quality Pre-AP[®] and AP professional development training. Additionally in 2013, Chelsea High School earned the 3rd Annual AP Honor Roll District of the Year in the small district category, awarded nationally to the district that simultaneously increased access to AP course work while maintaining or increasing the percentage of students earning scores of 3 or higher on AP Exams particularly among traditionally underserved student populations.

The College Board is strongly committed to extending our mission to college completion and to partnering with STEM stakeholders as a way to ensure that students are prepared and motivated to participate in a competitive global environment.

With best wishes for a successful summit,

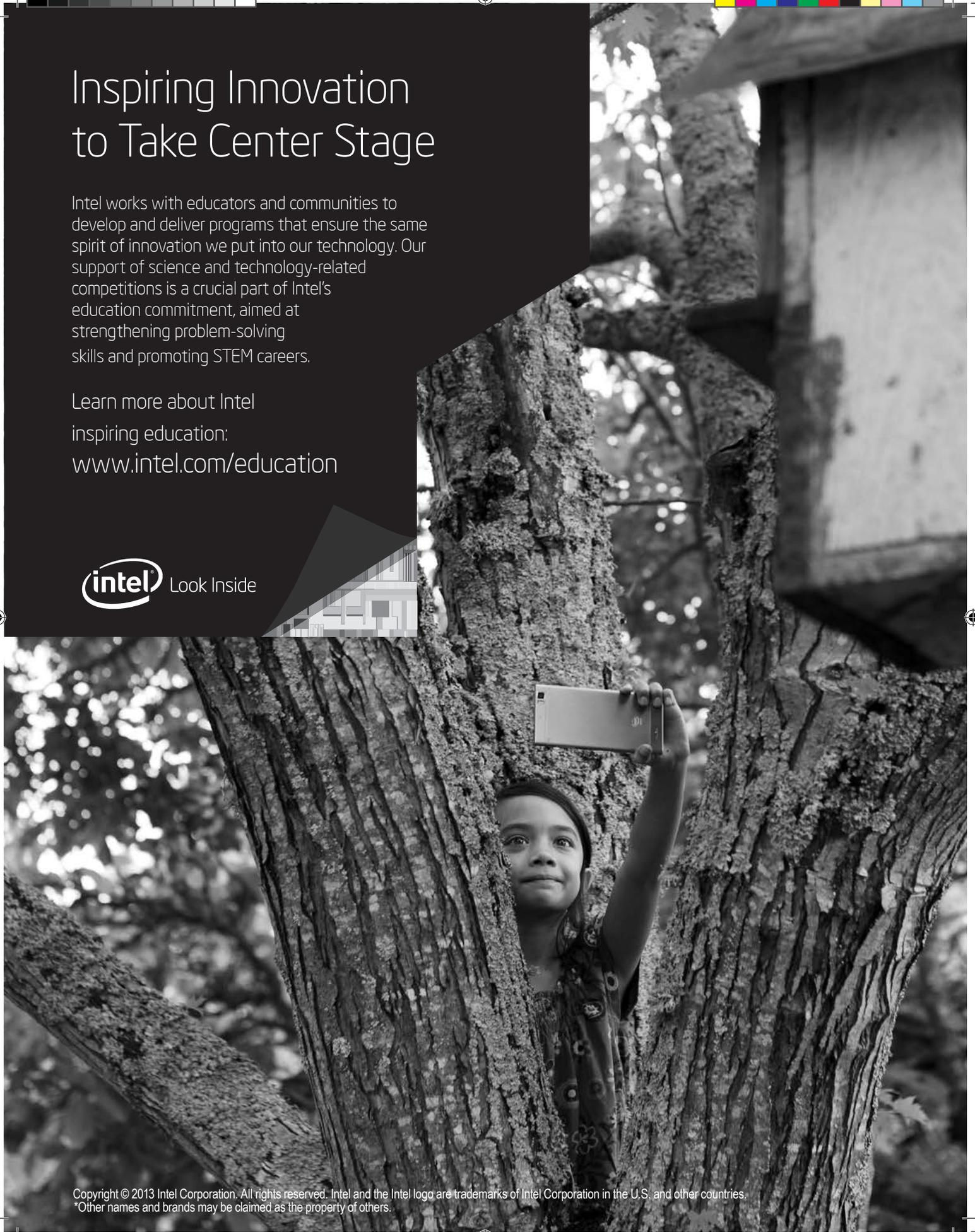


E. Edward Klotzbier
Regional Vice President

Inspiring Innovation to Take Center Stage

Intel works with educators and communities to develop and deliver programs that ensure the same spirit of innovation we put into our technology. Our support of science and technology-related competitions is a crucial part of Intel's education commitment, aimed at strengthening problem-solving skills and promoting STEM careers.

Learn more about Intel
inspiring education:
www.intel.com/education



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November 13, 2013

Dear STEM Stakeholders:

It is an honor and privilege for iRobot to participate in the 2013 Massachusetts STEM Summit. As we celebrate the tenth anniversary of the Summit, we should all be proud to have achieved a decade of work in the Science, Technology, Engineering and Math (STEM) fields and the great strides the Commonwealth has made toward achieving success in STEM education. I would like to thank everyone for their participation.

Like all of you, iRobot is committed to building a future for STEM education in the United States. Our multi-faceted outreach program is a resource for students, parents and educators to share in our excitement for the robotics industry and get an inside look at what we do here. iRobot STEM brings the exciting and educational world of robots into the classroom all year long with online resources, classroom visits, demonstrations and much more.

As a founder and lead organizer of National Robotics Week, iRobot actively promotes robotics as a pillar of 21-century American innovation. With events in all 50 states, National Robotics Week showcases the strength of the robotics industry in the U.S. and allows students to see how exciting a STEM or robotics career can be. Companies, universities, museums and associations across the U.S. are embracing National Robotics Week as an opportunity to capture the imaginations of children and share the exciting world of robots with all.

Rome wasn't built in a day, nor are robots or the skills needed to build them. We all need to prove to kids that science and math are cool. We all need to go to classrooms with world-changing technologies, explain where they come from and educate students on how they can be a part of it all. We all need to bring kids to labs and introduce them to the amazing engineers who turn these products from science fiction into reality.

I encourage all of you to continue celebrating STEM and to make robotics part of your initiatives. Bring your educational group to iRobot, or invite us to visit your group. Robots serve as a way to engage and show off the fun side of STEM in the hopes of inspiring youth to pursue technology-related fields and combat the STEM crisis in the U.S. Our employees enjoy the opportunity to share our robots with your students, and help to inspire the next generation to work with us at iRobot building cool stuff!

Sincerely,

A handwritten signature in black ink, appearing to read "Colin Angle", is positioned below the word "Sincerely,".

Colin Angle
Chairman, CEO and Co-Founder of iRobot



Dear STEM Stakeholders,

Mass Audubon is proud to support the 2013 Massachusetts STEM Summit. As one of the largest conservation organizations in New England, we are committed to delivering STEM-focused environmental education programs that prepare students with the knowledge and skills necessary to address the challenges and opportunities of the 21st century.

Our staff of educators engages 500,000 people across the Commonwealth annually, including 126,000 students, 32,000 of whom live in underserved communities. Each year more than 2,000 schoolteachers participate in our STEM-focused professional development seminars to learn methods for making biological science, earth science, climate change science, and green technologies more accessible to students.

Programs take place in classrooms and “in the field,” using Mass Audubon sanctuaries and schoolyards as outdoor laboratories where students learn and practice the work of biologists, ecologists, botanists, farmers, and clean energy engineers.

From Pre-K programs that encourage curiosity while developing skills of observing, describing, and sorting, to field-based science studies of rivers and streams for elementary and middle school students, we connect students to STEM content through project-based learning. And we also employ digital tools and technologies used by scientists as students collect, analyze, and share data about the world around them.

We are honored to support STEM in our role of advocating for and preparing our students to engage in a STEM-rich future.

Sincerely,

Henry Tepper
President

October 21, 2013

Dear STEM Stakeholder,

We are thrilled to be a participant in the tenth annual Massachusetts STEM Summit, which is expected to draw more than 1,000 attendees – making this year’s event the largest since the Commonwealth launched the STEM Summit in 2004. Massachusetts continues to be a leader in STEM education, and we are proud to play a part in helping to advance the state’s STEM agenda.

Under the leadership of Gov. Deval Patrick and his administration, the state has made significant progress in ensuring that all of the state’s students are prepared to take advantage of the booming STEM economy. Events like the Massachusetts STEM Summit are critical to maintaining the state’s momentum and its position as a national leader in STEM.

In 2008, only 65 African-American high school students in Massachusetts received a qualifying score on a science Advanced Placement exam. Today, five years after Mass Insight Education started working with its first cohort of Massachusetts high schools, that number has more than doubled, with 154 African-American students earning qualifying scores on 2012 AP science exams. Overall, there are now more than 8,000 students taking AP math, science and English courses at more than 50 Mass Insight partner high schools. Since 2008, we have more than doubled both the number of students participating in AP math, science and English courses at our partner high schools and the number of qualifying scores earned on those AP exams.

Despite the progress we’ve made, there is still room for improvement. Mass Insight Education, which runs the largest public-private college success initiative in the state, believes that increasing access to rigorous STEM courses in high school is a crucial step to increase the number of students who are prepared for college and career success.

Events like the Massachusetts STEM Summit help us figure out how to grow and nurture that untapped talent by bringing together key stakeholders from academic, industry and government partners. By working together, we can ensure that the state maintains its strong trajectory on STEM education, thus helping all of the state’s students gain the skills they need to do well in a 21st century global economy and ensuring the state’s economy is fueled by a pipeline of well-educated workers.

Sincerely,



William H. Guenther
Chairman, CEO and founder
Mass Insight Education

November 13, 2013

Dear STEM Stakeholders:

The Massachusetts Life Sciences Center (MLSC) is very pleased to support the 2013 STEM Summit: 10 Years of Statewide Collaboration. We also are proud to be represented on the Governor's STEM Council, the goal of which is to ensure that all students in the Commonwealth receive a strong education that prepares them for jobs in the innovation economy.

In the last few years, Massachusetts has established its undisputed global leadership in the life sciences. Our state has become "the place to be" for companies in industry sectors such as biotech, pharmaceuticals and medical technology. The state's hallmark is our talented workforce.

To meet the demands of the rapidly growing number of life sciences companies here in Massachusetts our workforce must keep pace -- in size and in skill levels. This means that students and future workers across the state must have the education and training they need to compete for and be successful in STEM-related careers. We are grateful to the Patrick Administration for their leadership in meeting this challenge by investing in the STEM education and training programs in Massachusetts.

The MLSC recognizes that there are different levels of skill and expertise needed by the state's life sciences industry sectors, ranging from research to biomanufacturing. And we are committed to doing our part to promote access across the state to the institutions and programs that are providing STEM education and training -- from K-12, to vocational/technical schools, to our community colleges, to our world-class universities, to community-based workforce development programs.

Collectively, we must engage students early on in STEM subjects. To support students' early interest in STEM, the MLSC has awarded 15 discretionary grants totaling nearly \$500,000 over the past three years. These grants build upon the Patrick Administration's strategy for enhancing STEM educational opportunities across Massachusetts. Grants have been provided to innovative programs including The DIGITS Project, Citizens Schools, the Girl Scouts, Science Club for Girls and Freedom House. These programs broaden young people's skills, while enhancing their knowledge of career opportunities in the life sciences and providing professional development for their teachers. Importantly, these programs also target girls and racial and ethnic minorities, who are under-represented among students interested in pursuing STEM-related careers.

The MLSC also has established High School Equipment and Supplies Grant Program. Over the first two program rounds, we have awarded grants totaling more \$6.6 million to 63 vocational technical schools, community colleges and workforce training organizations to support STEM education across the state. The third round of the program is currently underway and is focused on funding equipment for vocational technical high schools, Title I high schools, and public high schools in our Gateway Cities with the goal of promoting broader access to STEM educational opportunities in some of our most diverse communities.

For our college students and recent graduates, the MLSC continues to run the Internship Challenge, a year-round workforce development program that strengthens the talent pipeline for our state's life sciences industry by creating hundreds of internships each year that offer students a critical hands-on learning experience. To date, the MLSC has funded more than 1,350 paid internships at over 370 life sciences companies across Massachusetts!

I hope and expect that this year's STEM Summit will further mobilize our STEM community to solidify Massachusetts' place as a leader in STEM. We look forward to participating in the Summit and collaborating with you to make these goals a reality.

Sincerely,



Susan R. Windham-Bannister, Ph.D.
President & CEO

November 13, 2013

Dear STEM Stakeholders:

It is my privilege to represent National Grid at the Massachusetts STEM Summit 2013 for the third year running. I join Governor Patrick, Congressman Kennedy, the Governor's STEM Advisory Council and all of you today to ensure the future success of our country by promoting Science, Technology, Engineering and Math skills for the children of Massachusetts.

By bringing together educational, business, community and government leaders, the Massachusetts STEM Summit ensures the future success of the country and our economy by addressing critical STEM areas such as the education pipeline and workforce and economic development.

National Grid believes strongly in taking action in the present to help prepare and shape the future. Our approach to this is two-fold; we invest in programs that create excitement in STEM subjects for children of all ages and we ensure that educators are supported with the tools they need to educate this workforce of the future.

Reaching children as young as age three all the way to college students, our efforts include:

- A grant to the Boston Children's Museum to expand circulation of the STEM Sprouts Kit, introducing science to 12,500 three to five year olds
- Partnering with the Green Education Foundation to help K-12 students improve their energy efficiency through simple behavioral changes
- A multi-year commitment to City Year providing full-time tutors and role models to elementary students and helping raise math scores
- A grant to Jr. Tech to provide hands-on STEM workshops to 5th thru 12th grade students and a one-day STEM Summit for high school girls
- Sponsorship of FIRST Robotics regional competitions, bringing fun into science and engineering for middle school and high school students
- Partnering with Girls Inc., getting female middle school and high school students, an under-represented group, excited about science and math
- A partnership with the Museum of Science to help expand their capacity to bring the Museum's educational programs to under-served communities
- A grant to Worcester Polytechnic Institute in support of the University's team participation in the 2013 Solar Decathlon in Datong, China

We have lots of positions at National Grid that require a STEM education – and not just in engineering! With a good foundation in STEM, we know that each student will be equipped with the skills to become creative problem solvers for any future career path they may choose. Thanks to this potential workforce, the future of Massachusetts has never looked so bright.

Sincerely,



November 13, 2013

Dear STEM Stakeholders,

As an original sponsor of the Massachusetts STEM Summit, Raytheon is once again honored to support this tenth gathering of leaders and organizations partnering to strengthen the Commonwealth's position in science, technology, engineering and mathematics.

STEM disciplines are the foundation of innovation in this era of global competitiveness. So it is critically important for us to have a strong STEM pipeline for our Commonwealth and our country to continue as leaders in innovation.

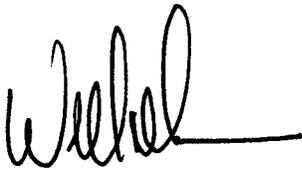
Fortunately, Massachusetts leads the pack nationally, thanks to the efforts of Summit participants and its co-hosts, the Governor's STEM Advisory Council, the Massachusetts Business Roundtable, and the University of Massachusetts Donahue Institute.

Raytheon has a longstanding commitment to supporting STEM education through our many MathMovesU® initiatives. We are involved in every stage of STEM education from elementary up through higher education with a wide range of programs that provide students with hands-on learning, teachers with support for professional development and parents with information resources.

We learned early on that our efforts have more of an impact when we partner and align with other like-minded organizations and groups – from industry, government, academia, nonprofits – to improve STEM education and workforce development.

We look forward to continuing this journey with you all – today, tomorrow and 10 Summits from now.

Sincerely,

A handwritten signature in black ink, appearing to read "W. Swanson", with a long horizontal line extending to the right.



2067 Massachusetts Avenue
Cambridge, MA 02140
www.terc.edu

617.873.9600 phone
617.873.9601 fax

► An Education Research and Development Organization

November 13, 2013

Dear Colleagues,

TERC is pleased to continue its support for the Commonwealth's science, technology, engineering, and mathematics community on the occasion of the Massachusetts STEM Summit 2013. Our sponsorship of this flagship annual event underscores TERC's core engagement in all facets of STEM education and ongoing commitment to bringing the highest quality learning opportunities to students across the state.

For nearly half a century, TERC has created research-based STEM learning materials and professional development programs for teachers and administrators, while also spearheading innovative educational technologies, virtual learning platforms, and the effective use of data to improve student achievement. TERC's evaluators offer expertise and services that further strengthen our bonds within the community of STEM educators on the local, state, and national levels.

Based in Massachusetts, TERC develops materials and programs in partnership with schools, institutions of higher education, research institutions, museums, and afterschool programs. The organization is committed to working within communities of practice to strengthen the nation's education infrastructure and foster a scientifically and mathematically literate citizenry capable of tackling great challenges that can impact our future prosperity, health, and happiness. In all of its endeavors, TERC emphasizes its core mission goals to increase STEM education engagement among diverse and traditionally underserved student groups, as a means of strengthening their future opportunities.

It is a privilege to support the Massachusetts STEM Summit and its goal of fostering statewide collaboration to improve STEM education and workforce development.

Sincerely yours,

Frank E. Davis,
President, TERC



UMass

Dartmouth

OFFICE OF THE PROVOST

Mohammad A. Karim, Ph.D.
Provost and Executive Vice Chancellor
for Academic and Student Affairs,
Chief Operating Officer

October 25, 2013

Welcome to all STEM Summit participants:

The University of Massachusetts Dartmouth embraces our role in preparing a new generation of leaders highly prepared in the growing STEM fields. We distinguish ourselves as a vibrant public university actively engaged in personalized teaching and innovative research, acting as an intellectual catalyst serving our faculty and students. The support and expansion of STEM education and development is at the core of our commitment to our students.

We will continue to build upon our record of supporting an integrated curriculum, building partnerships, and providing our undergraduate and graduate students with the tools necessary to excel in the innovation economy.

Our STEM Education and Teacher Development Department is committed to providing teacher preparation, licensing, and professional development opportunities for aspiring candidates and teachers who are already working in schools. We are committed to the preparation of educators who have sensitivity toward multicultural issues, an awareness of the particular concerns of urban education, knowledge of the unique styles of individual learners, and a conscious knowledge of the role of schools in promoting social justice in the 21st Century.

The Kaput Center, established in the spirit and vision of innovative thinker James Kaput, supports sustained investigation of foundational issues in mathematics education. The Center is a place where fundamental problems in mathematics education are studied, discussed and analyzed through conferences, colloquium series, basic research and development, commissioned reports, and think-tank meetings.

The mission of the Center for University, School and Community Partnerships (CUSP) is to improve student learning in the SouthCoast region by providing high quality inter-district professional development opportunities to K-12 educators that strengthen their content knowledge, curricula, instruction, and leadership skills. CUSP is dedicated to establishing and sustaining university-school partnerships to collaboratively design and develop programs to renew, revitalize, and retain K-12 teachers and administrators.

We are excited to be a part of this STEM Summit and partner with our fellow participants in expanding the Commonwealth's STEM leadership position.

Sincerely,

Mohammad Karim
Provost and Executive Vice Chancellor for Academic and Student Affairs,
Chief Operating Officer

Office of the Provost ■ www.umassd.edu

University of Massachusetts Dartmouth ■ 285 Old Westport Road ■ North Dartmouth ■ MA 02747-2300

Ph: 508.999.8024 ■ Fax: 508.999.8375





One University Avenue
Lowell, Massachusetts 01854
tel: 978.934.2635
fax: 978.934.5200

Ahmed T. Abdelal
Provost

OFFICE OF THE PROVOST

Greetings to all STEM Summit participants:

The University of Massachusetts Lowell is a proud sponsor of the STEM Summit and efforts throughout the Commonwealth to support programs to enhance STEM education. This has included a more than 20 year history of partnering with K-12 schools and community colleges to increase the pipeline in STEM fields.

We view the STEM challenge as two-fold:

1. **Advancing knowledge** –supporting faculty to conduct research that advances the frontiers of science and technology, and disseminating this “cutting edge” knowledge in ways that industry can apply for the benefit of society; AND
2. **Building motivation** – conveying the advancing knowledge of science and technology to students of all ages and backgrounds in ways that interest and motivate students to pursue these topics further, including careers in STEM fields.

To this purpose, our Graduate School of Education has teamed on many innovative STEM programs, including:

- Based on a national model and established in 2012 through a \$1.6M MA Department of Education award, UMass Lowell offers the only **UTeach** program in New England. This unique program provides practice-oriented teacher education program with a focus on inquiry-based and project-based instruction (<http://gse.uml.edu/uteach/>).
- Funded by a \$2.2M National Science Foundation grant, **Science Express** studies how informal learning (e.g., advertising on subways and buses) impacts the public’s understanding of science such as climate change. A collaborative effort between UMass Lowell and UMass Boston, the team also runs the related **Cool Science project**, engaging K-12 students, teachers, parents, and the general public with the science of climate change (<http://www.uml.edu/Education/Scienceexpress/>).
- In addition, we have many more projects and programs. Please visit our website (www.uml.edu/STEM) to find out more about: Artbotics (robotics and art education), GK-12 Waves, iSENSE science education, Computer science education, STREAM robotics education, Focus on Mathematics, USA Science & Engineering Festival, Mass Regional Science Bowl, Climate Change Initiative work, Northeast Regional Pre-K-16 Network, Project IMPACT, and more!

I hope you enjoy the STEM Summit, and we look forward to working with you on this important challenge of enhancing the STEM literacy of our great Commonwealth.

Sincerely,

Ahmed Abdelal



UNIVERSITY of MASSACHUSETTS
AMHERST

373 Whitmore Administration Building
181 Presidents Drive
Amherst, MA 01003-9313

Office of the Provost

Voice: 413.545.6223
Fax: 413.577.3980
www.umass.edu/provost

Greetings to all STEM Summit participants:

The University of Massachusetts Amherst places strong emphasis on STEM disciplines, and we are systematically increasing our scope and effectiveness in these fields to support health care, biotechnology, information technology, and other key sectors of the state's economy. Between 2006 and 2012, enrollment of entering STEM students grew by 68% (67% for under-represented minorities); overall one-year retention for students entering in STEM rose from 84% to 89%; and one-year retention (2011-2012) for URM students (in all fields) was 86%. Six-year graduation rates for students entering the University in a STEM field (both overall and URM) were equal to or higher than for the overall student population.

We are proud of this record, and our goals are to continue to increase STEM recruitment, increase the proportion of STEM entrants who graduate in a STEM discipline, and expand the graduate STEM pipeline. Toward that end, UMass Amherst has become a leading innovator in STEM education, especially for under-represented populations:

- Based on the success of the Northeast Alliance for Graduate Education and the Professoriate (NEAGEP), a UMass Amherst-led, \$12 million NSF-funded consortium to increase URM PhDs and URM entry to the professoriate in STEM disciplines, we created the STEM Diversity Institute to institutionalize and to expand beyond doctoral level training best practices developed under NEAGEP. We have leveraged the success of NEAGEP to obtain \$5.3 million in NIH funding to cultivate talent in STEM post-baccalaureate students and maximize development of STEM doctoral students from underrepresented groups.
- The Northeast Louis Stokes Alliance for Minority Participation (NELSAMP) is another UMass Amherst-led, NSF-funded consortium, focused on expanding undergraduate URM STEM completion. Collaborators are UConn, URI, Northeastern, and WPI. In its first nine years, NELSAMP institutions increased URM STEM B.S. production by 104% (135% at UMass Amherst). NELSAMP was renewed for \$2.5 million for another five years in September 2011.

We are pleased to support the STEM summit, and look forward to helping to build opportunities, careers, and the success of the Commonwealth.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Staros".

James V. Staros
Senior Vice Chancellor and Provost

Donna C. Cupelo
Region President
New England



November 13, 2013

Dear STEM Stakeholders,

It is an honor to support the 2013 Massachusetts STEM Summit, and be part of an important discussion with educators, business leaders, nonprofit partners, and public officials engaged in strengthening the Science, Technology, Engineering, and Math (STEM) skills of Massachusetts students.

All Summit participants should be commended for ensuring that students in Massachusetts have a strong STEM foundation necessary to succeed in higher education, and ultimately, careers that fuel our local and global economies. Thanks to your efforts, under the leadership of Governor Deval Patrick and U.S. Representative Joseph Kennedy, Massachusetts continues to be a national leader in STEM student achievement.

At Verizon, we're using technology to prepare students for success in the 21st century through support of Innovation Learning Schools, where the Verizon Foundation partners with the International Society for Technology Education. With this collaboration we provide intensive professional development for math and science teachers in underserved schools to help them use innovative technologies to improve student outcomes in STEM.

Verizon also has a national competition for middle school and high school students called the "Verizon Innovation App Challenge" in partnership with the Technology Student Association to drive students' interest in STEM through the development of mobile apps. In addition, our award-winning Thinkfinity.org website provides teachers with access to thousands of free, Common Core standards aligned resources designed in partnership with the nation's leading education experts. Over 65,000 members connect and collaborate in Thinkfinity's professional learning community.

We are pleased to work with such a committed group of people focused on ensuring that every student in Massachusetts is proficient in STEM. Together, we are molding the next generation of leaders who will drive innovation and economic growth for years to come.

Sincerely,

A handwritten signature in black ink that reads "Donna C. Cupelo".

Dear STEM Stakeholders:

On behalf of Governor Deval Patrick, we thank you for your commitment to ensuring that the people and businesses of Massachusetts have the STEM knowledge and skills necessary to succeed in the Commonwealth's innovation economy.

The Workforce Training Fund is actively engaged in promoting 21st century job skills, including STEM, to train current and newly hired employees so that Massachusetts businesses can thrive in the global economy. Enacted by law in July 1998 and financed entirely by Massachusetts employers, the Workforce Training Fund has awarded nearly \$14 million in grants to 550 businesses to train over 13,000 employees in the last year, alone.

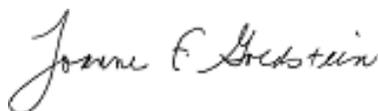
Through the Workforce Training Fund General Program, grants cover a range of training topics that are essential for businesses to compete in today's global marketplace. Training is customized by the awarded company, usually in collaboration with a training partner, and includes topics like quality and process flow, ISO, FDA documentation, supervisory and coaching skills, management and leadership, customer service skills as well as sales software, IT, and technical skills. The Workforce Training Fund also provides an Express program for small businesses to be able to send employees to ongoing "off the shelf" training.

Additionally, to support the employment of our returning veterans and long-term unemployed workers, the Workforce Training Fund operates a Hiring Incentive Training Grant that provides a \$5,000 grant for eligible Massachusetts veterans as well as eligible workers who have been unemployed for six months or longer who are hired and retained for 120 days, up to \$75,000 per company per year.

We encourage you to learn more about the Workforce Training Fund. You can learn more at www.mass.gov/lwd/employment or please stop by our booth at the STEM Summit and we would be happy to get you started!

The Massachusetts Workforce Training Fund is a great resource for the Commonwealth's businesses to continue to develop the STEM knowledge and skills of our talented workforce. We are honored to join with all of our colleagues to invest in the talent of emerging and current workforce.

Sincerely,



Joanne M. Goldstein
Secretary
Executive Office of Labor and Workforce Development



Nancy Snyder
President
Commonwealth Corporation

Dear Massachusetts STEM Summit Participants,

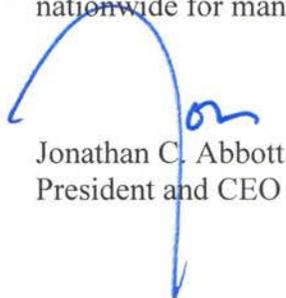
WGBH Boston is proud to be the media partner for the 2013 Massachusetts STEM Summit. We commend Governor Patrick and the Commonwealth for its extraordinary commitment to STEM education, convening this summit 10 years in a row.

As one of the nation's leading producers of media-based resources to help teachers teach and students learn, WGBH has a long history of commitment to STEM education in classrooms and homes across America. WGBH regularly engages learners from Pre-K through adult with innovative, STEM-based television programs, Web content, mobile apps, and school and community outreach initiatives. Many of our STEM productions are household names, *Curious George* and *Nova* among them.

We are pioneers in creating content for formal education. PBS LearningMedia™, developed in partnership with WGBH, provides educators nationwide with media-rich resources, tools, and professional development opportunities. The free site contains more than 34,000 digital resources, including thousands of STEM resources produced by WGBH. PBS LearningMedia now has more than 1.2 million registered users.

The New York Times recently reported that according to TIMSS, the Trends in International Mathematics and Science Study, "If Massachusetts were a country, its eighth graders would rank second in the world in science behind only Singapore." WGBH salutes the State's Department of Education, the participants in today's summit, and educators statewide for making STEM education a priority...and for making a real difference.

Looking ahead, WGBH is committed to working with you to create 21st-century media resources to support STEM education here at home and nationwide for many years to come.



Jonathan C. Abbott
President and CEO



WORCESTER POLYTECHNIC INSTITUTE

OFFICE OF THE PRESIDENT

October 10, 2013

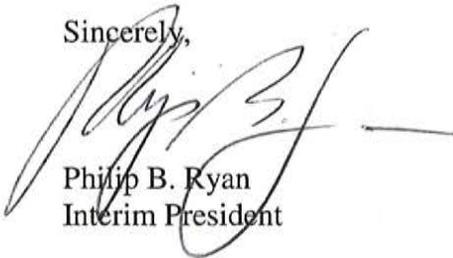
Dear STEM Stakeholder,

On behalf of the entire WPI community, I commend the achievements of this vibrant group of dedicated educators, non-profit partners, business and government leaders and higher education colleagues. WPI is once again pleased to continue our support of this important work and delighted to celebrate our joint accomplishments and set direction for the years ahead.

WPI has a strong commitment to STEM education. In March 2012, we launched the WPI STEM Education Center, which seeks to advance licensure and degree programs, professional development, and research to address teaching and learning. The Center, led by executive director Martha Cyr, will continue to build upon the foundation we set with Project Lead The Way, one of six @Scale endorsed programs in the state, and our unique technology offerings, such as ASSISTments. In addition to the work of the Center, WPI continues to support a variety of K-12 outreach efforts designed to engage students in STEM fields, such as Camp Reach and robotics.

It is vitally important to our future economic well-being that we continue to invest our time, expertise, and funding to support education at all levels and most especially in the areas of science, technology, engineering and mathematics. WPI remains a staunch supporter of this work and joins our partners to realize our goals for the Commonwealth and set an example for the nation.

Sincerely,



Philip B. Ryan
Interim President

Raffle Prizes

DONATED PRIZE	COMPANY ORGANIZATION	ARRANGED BY:
Roomba	I-Robot Corporation	Northeast Region
One-Year Family Membership to Heritage Museums & Gardens	Heritage Museum & Gardens	Southeast Region
Ocean Explorium Museum	New Bedford Ocean Explorium	Southeast Region
4 Tickets to Ecotarium Museum in Worcester	EcoTarium	Central Region
4 passes each to Omni, Planetarium, exhibit hall	Boston Museum of Science	Boston Region
Berkshire Museum Dual/Family level membership	Berkshire Museum	Berkshire Region
Leather Padfolio /Mug	Millitech Inc.	Pioneer Valley Region
EV3 Lego Set	Lego	Pioneer Valley STEM Network
Discovery Museum Tickets	The Discovery Museums	MetroWest Region
Patriot's Football Tickets and Parking Passes	Patriot Organization	Governor's STEM Advisory Council/DHE
UMass Amherst Basketball tickets, tote and hat	UMass Donahue Institute	UMass Donahue Institute
4 Tickets to the Smith College Museum of Art	Clark Science Center, Smith College	Smith College

@Scale Endorsed Projects

Phase I - Student Interest/Readiness



BioTeach is an ambitious program that features teacher professional development, equipment supply and student experiential learning. The program is designed to support biotechnology instruction and career awareness activities. The program prepares teachers to access and use biotechnology curricula, exposes students to career awareness activities, and partners with government and local businesses to support scientific curiosity and increase student participation in sciences. Over a six year period, BioTeach has provided professional training for more than 600 educators in 177 Massachusetts high schools. Contact: Robert Ross at Robert.ross@massbio.org or 617-674-5153. www.massbioed.org



DIGITS is a classroom program that pairs STEM professionals with sixth-grade classes throughout the state to increase students' interest in STEM subjects and careers. STEM volunteers meet and talk with students about their careers, lead students in interactive STEM-related exercises, and serve as role models, encouraging students to study math and science and urging them to consider STEM careers. The program, which is based on a uniquely designed alphabet with STEM icons embedded in each letter, takes place in a math or science class during the course of a typical school day. Contact: Joyce Plotkin at joyce@digits.us.com or (617) 694-7309. <http://digits.us.com>



MASS MATH + SCIENCE INITIATIVE was created to drive a school culture of high expectations by dramatically increasing participation and performance in Advanced Placement courses, particularly among underserved populations, to prepare students for college and career success in science, technology, engineering, and mathematics (STEM). MMSI focuses on three measurable goals: 1) Increase AP participation, 2) Increase AP performance and 3) Increase college success. MMSI is currently working directly with 8,000 students in 53 high schools across the Commonwealth. Contact: Morton Orlov II at orlov@mmsi.org or (617) 778-1528. www.massinsight.org/mmsi.



Massachusetts PLTW is a nationally-acclaimed, project-based, STEM curriculum for grades 6-12 that uses real-world problem-solving as a framework. PLTW curriculum offers students engaging programs in engineering and biomedical sciences to prepare them for STEM post-secondary education and careers. PLTW is offered at over 4,200 middle and high schools in all 50 states, including 26 MA schools. WPI is one of 38 affiliate universities for the PLTW Engineering Program and runs a two-week professional development summer institute to prepare educators to teach PLTW courses. Contact: Terry Adams at tadams@wpi.edu or (508)831-5198. www.pltw.org



Massasoit Community College's Science Transfer Initiative has a goal of increasing enrollment, retention, diversity, and access for students who plan to transfer to four-year liberal arts baccalaureate degree institutions and who wish to major in the sciences, engineering, pre-med, or other advanced medical fields. The principle goal is to prepare students for successful transfer to four-year institutions as science majors by providing early undergraduate research opportunities, enhanced advising, mentors for academic and career advice, exposure to science career paths, and access to financial aid. Contact Gilles Bolduc gbolduc@massasoit.mass.edu or (508) 588-9100 X1617 www.massasoit.mass.edu/



Advanced Robotics Intensive (ARI), through Quinsigamond Community College, introduces students to many STEM topics at one time (engineering, electronics, physics, computer programming, etc.), providing math and science enrichment and real life teamwork experiences. ARI utilizes a variety of approaches to robotics like summer camps and middle school after-school programs. Students participate in "kick-offs", practice sessions and competitions at QCC. Teams pair up to work on a unique challenge (i.e. a series of "obstacles" on a game board) and compete with other schools, which fosters awareness of others, collaborative innovation and strategy. Contact: Betty Lauer at blauer@qcc.mass.edu or (508) 854-2765. www.qcc.edu.



National Center for Technological Literacy
Museum of Science, Boston

the Gateway Project was developed to assist school districts in developing a strategic plan of action to implement rigorous and engaging K-12 technology and engineering programs that both inspire and encourage student achievement. In addition, the program introduces educators to user-friendly tools and resources (developed by the NCTL) that deliver technology and engineering content. These tools are not only designed to inspire students but are also aligned with state standards, making them ideal teaching instruments to peak students' interest in STEM topics. Contact: Yvonne Spicer at yspicer@mos.org or (617) 589-3101. http://www.mos.org/nctl/k12_gateway.php

@Scale Endorsed Projects

Phase II – College Degrees & Workforce Development



UMass “ABLE 4 STEM” is an acronym meaning Associate’s and Bachelor’s Linked Education (ABLE) 4 (4 UMass campuses) STEM (science, technology, engineering, mathematics) and refers to a comprehensive approach to double the number of STEM degrees at both the associates of science and bachelor of science levels over a four year period. All 4 university undergraduate campuses and the 15 public community colleges are engaged in this initiative. Contact: John Cunningham at jcunningham@umassp.edu or (617) 287-7050. www.able4stem.org



BATEC’s “Big Data” program provides training to students as well as displaced and incumbent workers seeking to upgrade or develop their knowledge and skills in Information Technology. BATEC has scaling plans to expand their programming to Roxbury Community College, Northern Essex Community College, Quinsigamond Community College and Holyoke Community College. Contact: Deb Boisvert at Deborah.Boisvert@umb.edu or (617) 287-7295. www.batec.org.



Central Mass WIB’s “STEM Power” project re-engineers Career Center practices, procedures and policies to provide a sector-based approach to nearly all facets of the services offered to dislocated workers including job seeker STEM pathways outreach, orientation and education; STEM related pathways career counseling; training; placement for job seekers; and STEM employer engagement and support. 16 local Workforce Investment Boards (WIBs) and their One-Stop Career Centers are partners in this project. Contact: Jeffrey Turgeon at TurgeonJ@worcesterma.gov or (508) 799-1590 www.worcesterma.gov/development.

MCCANN TECHNICAL SCHOOL “**Western Regional Partnership**” is a workforce development project in the areas of advanced manufacturing. The educational institutions that make up the STEM Western Regional Partnership, which include the McCann Technical School, Putnam Vocational High School, Westfield Vocational High School and Franklin County Vocational High School, currently offer Chapter 74 approved technical programming in advanced manufacturing, precision manufacturing and machine tools. Contact: James Brosnan at jbrosnan@mccanntech.org or (413) 663-5363. www.mccanntech.org.

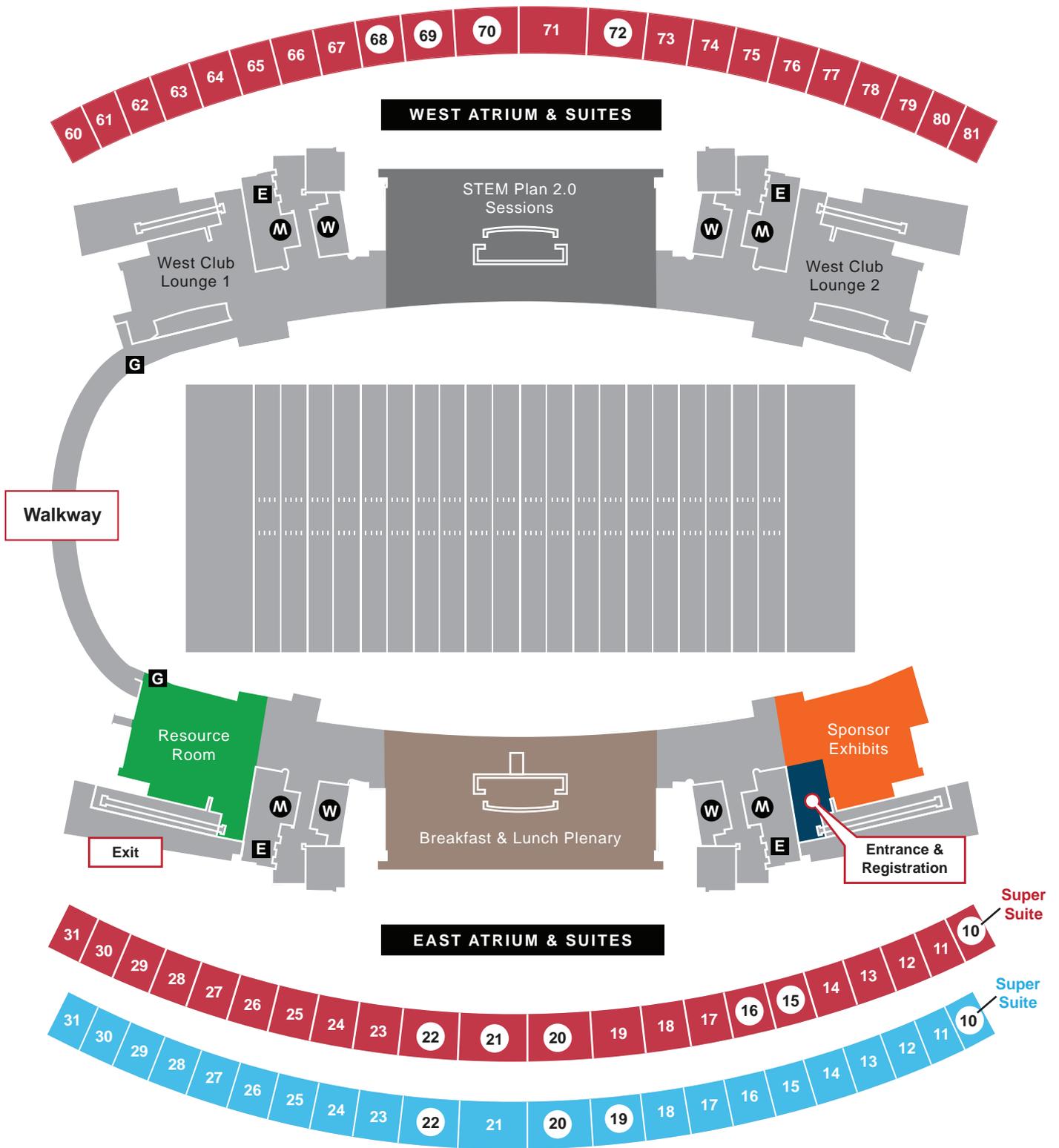


MCLA’s “STEM Pathways Project” (SSPP) promotes student success with the goal to increase graduation rates by providing strategic and successful initiatives which address students’ academic, experiential, and career awareness interests. MCLA’s SSPP employs a STEM retention plan, starting with activities for freshman and continuing through senior year. Administered through the MCLA Center for Student Success and Engagement (CSSE), the program delivers enhanced academic support, advising, and career planning, and marshals the efforts of both the academic affairs and student affairs divisions. Contact: Monica Joslin at m.joslin@mcla.edu or (413) 662-5242. www.mcla.edu.

ROOM ASSIGNMENTS

EAST SIDE – MAIN LEVEL			
Room	Breakout Session I (9:45-11:00)	Breakout Session II (11:15-12:30)	Breakout Session III (2:30-3:45)
East Club: Lounge 1	Registration and Sponsor Exhibits		
East Club: Atrium	Plenary Area: Breakfast, Lunch, and Closing Session		
East Club: Lounge 2	Resource Room		
EAST SIDE – RED LEVEL (UP 1 FLOOR)			
Room	Breakout Session I (9:45-11:00)	Breakout Session II (11:15-12:30)	Breakout Session III (2:30-3:45)
Red Level Super Suite 10	K-12 Ed: Identifying and Developing Students' Conceptual Thinking in Science	K-12 Ed: Draft Revised State Science and Technology/Engineering Standards	Higher Ed (BA/BS+): Higher Education Partnerships through the Continuum: K-12, Colleges and into STEM Workforce
Red Level Suite 15	K-12 Ed: Teaching Computer Science: Great for Our Students and the MA Innovation Economy	K-12 Ed: Middle and High School Students Demonstrate Computer Science Success Stories	K-12 Ed: Using Engineering Practices to Bridge the STEM Gap
Red Level Suite 16	K-12 Ed: Building School District Capacity to Support Computer Science: Superintendent/Business Leader Panel	K-12 Ed: Examining the Intersection of the Standards for Math Content and Standards for Math Practices	K-12 Ed: Introduction to the Science and Engineering Practices
Red Level Suite 20	K-12 Ed: Building Sustainable PreK-12 STEM Programs One District at a Time	Out-of-School Ed: Bridging the Divide: Incorporating Identity and Culture to Sustain STEM Engagement	Out-of-School Ed: Afterschool and Out-of-School Time Roundtable Discussion
Red Level Suite 21	K-12 Ed: The New MA Common Core Mathematics Standards & Assessments Increasing Students' Mathematical Understanding		K-12 Ed: Model Curriculum Units as Key Resources for STEM Implementation
Red Level Suite 22	Higher Ed (BA/BS+): Leading STEM Reform on Your Campus	K-12 Ed: Putting the M in STEM	Career Awareness: Higher Education and Industry Partnerships for Career Awareness
EAST SIDE – BLUE LEVEL (UP 2 FLOORS)			
Room	Breakout Session I (9:45-11:00)	Breakout Session II (11:15-12:30)	Breakout Session III (2:30-3:45)
Blue Level Super Suite 10	Out-of-School Ed: Structuring Partnerships - What Makes Afterschool Programs Work?	Career Awareness: Pathways to STEM Careers: Aligning Industry, Educators and Parents to Raise Student Awareness	Workforce Dev / Comm Coll: Where the STEM Jobs Are
Blue Level Suite 19	Workforce Dev: Training for Jobs in Life Sciences: What Happens After High School?	Comm Coll: STEM Pathways from Secondary through Post-secondary Education	Workforce Dev / Comm Coll: Giving Job Seekers a Boost to the First Rung of the STEM Career Ladder
Blue Level Suite 20	Workforce Dev: Scaling the Applied Manufacturing Career Pathways Pyramid	Workforce Dev / Comm Coll: Tying College to STEM Careers: MA Community Colleges & Workforce Development Transformation Agenda	
Blue Level Suite 22		K-12 Ed: Engineering Adventures in Afterschool	
WEST SIDE – MAIN LEVEL			
Room	Breakout Session I (9:45-11:00)	Breakout Session II (11:15-12:30)	Breakout Session III (2:30-3:45)
West Club: Lounge 1	Early Childhood Ed: Integrating STEM Concepts & Practices into Classroom Experiences to Promote Engagement & Learning	Early Childhood Ed: STEM Sprouts in Preschool: How Museums, Libraries & Public Broadcasters Support Early STEM Education	Early Childhood Ed: Developing the Child's Interest in STEM: Moving from Theory into Practice
West Club: Atrium	STEM Plan 2.0: MA State STEM Plan 2.0	STEM Plan 2.0: MA State STEM Plan 2.0: Discussion and Implementation Strategies	STEM Plan 2.0: MA State STEM Plan 2.0 - Contextualized Conversations
West Club: Lounge 2	Career Awareness: It's Elementary - Inspiring STEM Students from PreK-6th Grade	Higher Ed (BA/BS+): Designing a Curriculum for Deep Learning	K-12 Ed: Integrated STEM Curriculum and Teaching
WEST SIDE – RED LEVEL (UP 1 FLOOR)			
Room	Breakout Session I (9:45-11:00)	Breakout Session II (11:15-12:30)	Breakout Session III (2:30-3:45)
Red Level Suite 68		STEM Students: GO PUBLIC: Conversation with Student STEM Majors at MA Public Colleges & Universities: Session 1	STEM Students: GO PUBLIC: Conversation with Student STEM Majors at MA Public Colleges & Universities: Session 2
Red Level Suite 69	Digital Ed: Digital Resources to Engage Students in STEM	Digital Ed: Global Connections in Science	Digital Ed: Digital Games for STEM Education
Red Level Suite 70		Research - Practice: Research-Based STEM Resources: Closing the Gap between Researchers and Practitioners	
Red Level Suite 72		Youth Innovators: STEM Innovation & Entrepreneurship (Morning Session)	Youth Innovators: STEM Innovation & Entrepreneurship (Afternoon Session)

EVENT MAP



Legend

- Red Level Suites
- Blue Level Suites
- W Women's Room
- M Men's Room
- E Elevator
- G Golf Carts

Special Thanks

Cora Beth Abel, MA State Science & Engineering Fair
Katy Abel, MA Dept. of Higher Education
Rick Adrion, CAITE
Dale Allen, Quinsigimond Community College
Beth Ashman, MA Dept. of Higher Education
Michael Baines, Franklin Hampshire REB
Barbara Berns, EDC
Ayora Berry, PTC
Deb Boisvert, BATEC
Susan Bronstein, UMass President's Office
Jim Brosnan McCann, Technical High School
Susan Buckey, Boston PIC
Marybeth Campbell, Executive Office of Education
David Cedrone, STEM Council/MA Dept. Higher Educ.
JD Chesloff, MA Business Roundtable
Connie Chow, Science Club for Girls
Wendy Cleaves, UMass Medical School
Anne Marie Condike, MA Dept. Elem. & Secondary Educ.
Keith Connors, MA Dept. Higher Educ.
Kristin Cormier, UMass President's Office
Maria Cotto Vargas, UMass Online
Martha Cyr, Worcester Polytechnic Institute
Laura Dauphinais, Raytheon
Marilyn Decker, MA Dept. Elem. & Secondary Educ.
Lisa Derby, Oden Mass MEP
Stacey Edwards, UMass Online
Jacob Foster, MA Dept. Elem. & Secondary Educ.
Gretchen Fougere, College of Engineering, BU
Jennifer Freeman, MA Community Colleges & Workforce
Development Transformation Agenda
Adam Freudberg, Office of Governor Patrick
Vicki Grisanti, Robotics Education and Competition Foundation
Patricia Halberg, Girl Scouts–Central and Western Mass
Lance Hartford, MassBioEd Foundation
Monica Joslin, MCLA
Chris Kealey, MA Business Roundtable
Jennifer Keller Jackson, NCIIA
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