



STEM Summit VI: Ensuring the Pipeline

*Preparing Massachusetts Students for Careers in Science,
Technology, Engineering, and Mathematics*

Tuesday, October 20th, 2009 from 7:00 a.m. to 3:00 p.m.
Sturbridge Host Hotel and Conference Center, 366 Main Street, Sturbridge, MA 01566

Schedule of Activities

7:00 – 9:00 **Continental Breakfast**

7:30 – 8:15 **First Time Attendee Session**

This preliminary meeting will provide an overview of Science, Technology, Engineering and Math (STEM) with a focus on diversity and access, including legal definitions of Affirmative Action, Equal Opportunity, and Diversity. All individuals who are new to the STEM Summits are welcome to attend, as are returning attendees who are interested in the theme for this year's meeting.

Moderators: John F. Hodgman, Howard Foley Professor for High tech Workforce Development, UMass Lowell College of Engineering

Larisa K. Schelkin, CEO, Co-Founding Director & President, DOME Foundation, Inc.

8:15 – 9:00 **Sign-in**

9:00 – 9:30 **Welcome and Preliminary Speakers**

Secretary Paul Reville, Executive Office of Education

Commissioner Richard M. Freeland , Department of Higher Education

Commissioner Mitchell D. Chester, Department of Elementary and Secondary Education

Commissioner Sherri Killins, Department of Early Education and Care

9:30 – 10:00 **Keynote Speaker: Lt. Governor Timothy Murray**

Introduction: President Jack M. Wilson, University of Massachusetts

10:00 – 10:15 **Overview of the Day's Events**

J. Lynn Griesemer, Associate Vice President for Economic Development, University of Massachusetts, and Executive Director, UMass Donahue Institute

10:30 – 12:00 Morning Break-out Sessions

Strand 1: Diversity – Advancing Diversity and Access in STEM

This session will provide an overview of diversity and access in Science, Technology, Engineering and Math (STEM) education & careers for individuals with disabilities by examining current trends and issues, recent research developments, and best practices for education to support students with learning disabilities and attention disorders. We will also review how students with various disabilities (including cognitive/psychological) are typically accommodated and what is the typical process for their receiving those accommodations. The session will specifically include discussion of access in Massachusetts K-12 and higher education contexts, assistive and adaptive technologies, web and instructional technology accessibility, and issues related to learning and cognitive disabilities such as ADHD and Autism-spectrum disorders.

Our panelists are the best national experts in the field. There will be ample time for questions and structured discussion. Attendees will leave with resources for their own institutions for improving programming activities for individuals with disabilities.

Moderator: Larisa K. Schelkin, CEO, Co-Founding Director & President, DOME Foundation, Inc.

Panelists: Terrill Thompson, Technology Accessibility Specialist, University of Washington

Mweusi L. Willingham, Headmaster, The Engineering School – Boston Public Schools; DOME Foundation Board of Directors

Diane S. Webber, Professor, Director, Program for the Advancement of Learning (PAL), Curry College

Steven Fadden, Vice President for Research, Landmark College and Director, Landmark College Institute for Research and Training

Strand 2: District-Level STEM Planning

What do we mean by a STEM agenda, and what is the role of school districts? This session will help school district leaders develop a vision and strategic plan of action. Drawing on SAT survey data about intended college majors, we will discuss strategies for increasing students' interest in, preparation for, and success in pursuing STEM careers and fields of study. Who should attend? We encourage teams of two to four district leaders to attend. These might include science and mathematics coordinators, guidance directors, and administrators responsible for district-wide planning. SAT data on intended STEM college majors from 2005 through 2008 will be available to all who attend. Preliminary handouts will be emailed to those who register at least two weeks in advance so that teams can preview the information to be discussed. These data will help districts to develop their own STEM talent plan.

Moderator: Ronit Carter, Education Consultant; President, The Promise of Excellence; Acting Associate Director, Leadership Initiatives for Teaching & Technology

Panelists: Jean Supel, Research Manager, UMASS Donahue Institute

Ed Wisner, Curriculum Coordinator for Science, Brookline High School

Lisa Glickstein, Grants Coordinator, Andover Public Schools

Sheila Thomas, Technology Integration Specialist, Fitchburg High School

10:30 – 12:00 Morning Break-out Sessions, Continued

Strand 3: Wingspread – Immersion in STEM through Teaching Innovation

Enlightening, engaging and interactive are just a few descriptors that should be used when describing the 21st Century learning environment in all our schools. Using Web 2.0 tools with Web 3.0 quickly taking shape accelerates the need for teachers to be continually one step ahead of their students. The Wingspread “fishes” will divulge resources and opportunities available to support 21st Century innovations in the classroom.

Moderators: Annamaria Schrimpf, Director of Educational Technology, Winchester Public Schools

Lori Weir, Program Coordinator, Information Technology Middlesex Community College

Panelists: Tom Daccord, Educational Technology Specialist, Center for Teaching History with Technology

Romeo Marquis, Executive Director, Learning Curve

Joanne Najarian, Instructional Technology Specialist, Winchester Public Schools

Strand 4: Career Awareness – Life Science Career Development Initiative

Young people need information about STEM careers, exposure to various work environments, role models with whom they can identify and personal encouragement in order to imagine themselves in these roles. Often there is little or no opportunity for them to imagine career options beyond those pursued by their immediate family or their neighbors. The challenge is to create meaningful effective models that provide these missing ingredients to the lives of students.

These sessions will highlight programs that are operating in Massachusetts and creating different avenues for middle and high school students to become aware of, and connected to, future careers in STEM.

The morning session will feature the Life Science Career Development Initiative, an innovative high school-based program sponsored by the Massachusetts Biotechnology Education Foundation. Participating high school science teachers and guidance counselors will discuss the varied approaches their schools have taken to connect students with the biotechnology industry’s career information and role models. Data derived by researching the effort will be shared by the program’s external evaluator, TERC. We have evidence of real change in the way students seek and use career information resources.

Moderator: Bob Ross, Director, BioTeach Program

Panelists: Paula Beisheim, Science Department Chair, Norton High School

Janice Chiappone, Director of Guidance, Bellingham High School

Karen Mutch-Jones, Senior Evaluator, TERC

10:30 – 12:00 Morning Break-out Sessions, Continued

Strand 5: Resources from Informal Education – Thinking Outside the Classroom, Opportunities for Educators and Students: Professional Development Opportunities

What kinds of resources and professional development opportunities are available for formal educators through museums, aquariums, nature centers and other science education facilities? This session will highlight successful graduate-level, professional development opportunities these organizations offer which carry graduate credit from colleges and universities. We will discuss the unique resources offered by these courses as well as the follow-up support provided for the classroom and teachers. Some of these courses can be tailored to the specific needs of a school system and offered during the school year; others are offered during the summer.

Moderator: Terry Kwan, Education Consultant, retired science teacher, teacher-trainer, and school board member for Brookline Public Schools

Panelists: Sandra Ryack-Bell, Executive Director, Museum Institute for Teaching Science (MITS, Inc.)

Jayshree Oberoi, Director, Teacher Resources, New England Aquarium

Alexander Goldowsky, Director of Education, EcoTarium

Raji Patel, Co-Director, Massachusetts Space Grant Consortium

Annette Sawyer, Director of Education, Museum of Science

Strand 6: Building STEM Teacher Capacity – An Interactive Session Showcasing Innovative Approaches to Professional Development

How can school districts effectively choose and develop a strategic approach to professional development for STEM teachers and programs with the support of the STEM industry? We will briefly discuss a framework for selecting professional development opportunities (meaningful, measurable, sustainable, scalable and regional). Participants will then engage in hands-on small-group activities and discussions from two innovative experiential professional development programs: *Three Steps to Engaging Student Learning in Science* and the *Mathematics Professional Learning Community* curriculum. Attendees will leave with a sampler of STEM professional development programs (including online options) and a framework for evaluating and planning professional development programs.

Moderators: Robert W. Richardson, East Coast Education Manager, INTEL

Barbara Libby, STEM Director, Department of Elementary and Secondary Education

Panelists: Cora Beth Abel, Executive Director, Massachusetts State Science & Engineering Fair, Inc.

Dona Apple, Mathematics Consultant, Regional Science Resource Center, University of Massachusetts Medical School

Sandra Mayrand, Director, Regional Science Resource Center, University of Massachusetts Medical School; Coordinator, Mathematics Learning Community Curriculum

William F. Rigney, Science and Technology/Engineering Coordinator, Grades 6-12, Marlborough Public Schools

Remarks: Jim Stanton, Director, The Technology Initiative, Metro South/West Regional Employment Board

10:30 – 12:00 Morning Break-out Sessions, Continued

Concurrent Meeting: Tapping Massachusetts' Potential Step II: Advancing the STEM Movement Through A Leadership-Employer Alliance

STEM Summit VI is proud to host the second in a series of meetings following the STEM Business Leaders Breakfast held June 18th, 2009, at the Museum of Science which featured the release of the report: *Tapping Massachusetts' Potential – The Massachusetts Employers' STEM Agenda*. Building on the discussion that was begun in June, today's meeting will focus on the critical role STEM education plays in the future of the Massachusetts economy, a review of STEM incentive programs, and an inventory of STEM best practices.

A facilitated discussion will identify gaps, redundancies, challenges and opportunities in STEM education in Massachusetts. The session will involve participants developing, and formulating a consensus around, specific strategies that will identify ways in which they and others can advance the STEM movement in Massachusetts.

Results of the discussion from this morning meeting will be reported out on at one of the afternoon break-out sessions where the conversation will be furthered and additional recommendations gathered.

Welcome: Secretary Paul Reville, Executive Office of Education

Inspiration: Stephen Vinter, Engineering and Site Director, Google

Moderator: Greg Sheldon, President, Sheldon Collaborative

Consensus/Next Steps: Ellen J. Ferraro, PhD, Deputy Director System Validation Test and Analysis Directorate, Raytheon Integrated Defense Systems

Deborah Boisvert, Executive Director, BATEC, UMass Boston

J.D. Chesloff, Deputy Director, Massachusetts Business Roundtable

12:00 – 12:45 Lunch Buffet

12:45 – 1:20 Lunch Presentations

Sarah Dougherty, Senior, Marlborough High School, 1st place award winner at the State Science & Engineering Fair at MIT. **Introduced by William F. Rigney**, Science and Technology/Engineering Coordinator - grades 6 through 12, Marlborough High School

Opening Minds to Math and Science: A Middle School Career Awareness Program, Massachusetts Technology Leadership Council, The Engineering Center, MassBioED, Massachusetts Networks Communications Council, MassMEDIC and The New England Clean Energy Council. **Introduced by Joyce Plotkin**, President Emerita, Massachusetts Technology Leadership Council, Inc.

1:30 – 3:00 Afternoon Break-out Sessions

Strand 1: Diversity – Recruitment & Retention of Underrepresented Students in STEM

This session will provide an overview of diversity and access in Science, Technology, Engineering and Math (STEM) by examining current trends and issues, recent research developments, funding opportunities and best practices. There will be ample time for questions & structured discussion. Attendees will leave with resources for their own institutions for improving programming activities & learning more about NSF funding.

Moderator: Larisa K. Schelkin, CEO, Co-Founding Director & President, DOME Foundation, Inc.

Panelists: Susan Bronstein, Ed.D., Director, Learning Resource Center, UMass Amherst - Northeast Louis Stokes Alliance for Minority Participation (Northeast LSAMP) Team: University of Massachusetts Amherst, Northeastern University, University of Connecticut, University of Rhode Island, and Worcester Polytechnic Institute

Marshall Milner, Program Director, UMass Boston - Urban Massachusetts Louis Stokes Alliance for Minority Participation (UMLSAMP) Team: UMass Boston, UMass Dartmouth, UMass Lowell, Wentworth Institute of Technology, Bunker Hill Community College, Roxbury Community College, Bristol Community College, and Middlesex Community College

Dr. Rachelle Reisberg, Director, Women in STEM, Northeastern University

James Hicks, NSF Program Director, Alliances for Broadening Participation in STEM (tentative)

Strand 3: Wingspread – Continuing the Conversation

In the afternoon, attendees will have the opportunity to see some of the resources mentioned in the morning session and potential opportunities to use them in their classroom will be discussed. The attendees will be given an opportunity to continue the conversation and brainstorm with the Wingspread "fishes" and many of their colleagues what next steps they will need to take for implementation of some of the tools explored in both sessions.

Moderators: Annamaria Schrimpf, Director of Educational Technology, Winchester Public Schools

Lori Weir, Program Coordinator, Information Technology Middlesex Community College

Panelists: Tom Daccord, Educational Technology Specialist, Center for Teaching History with Technology

Romeo Marquis, Executive Director, Learning Curve

Joanne Najarian, Instructional Technology Specialist, Winchester Public Schools

Strand 4: Career Awareness – Middle School Initiatives

During our afternoon session we will explore a number of middle school efforts sponsored by corporations and educational entities. Middle school students know very little about jobs and careers, which is as expected. But what is less well known is that students, as early as 6th grade, stop “adding” careers in their minds and start “subtracting” possible future careers for themselves. This problem is particularly acute for careers in science, technology, engineering and math.

This panel will present a discussion on work they are doing to expose middle school students to STEM careers. It will include a discussion of what two technology companies are doing as well as best practices on how to involve parents and “Community Influencers” in shaping student perceptions about STEM subjects. The panel is also ready to take a hypothetical problem from the audience and discuss how to set up a similar effort in other regions of the state.

Moderator: Susan K. Moulton, President, Moulton Consulting

Panelists: Victoria Grisanti, Senior Manager, Community Involvement, EMC Corporation

Kathy Berube, K-12 Science Curriculum Coordinator, Worcester Public Schools

Sandra Mayrand, Director, Regional Science Resource Center, University of Massachusetts Medical School; Coordinator, Mathematics Learning Community Curriculum

Robert Richardson, East Coast Education Manager, Intel

Carol King, Project Director, Massachusetts Technician Education Collaborative, Quinsigamond Community College

Strand 5: Resources from Informal Education – Thinking Outside the Classroom, Opportunities for Educators and Students: Classroom Resources for Students and Teachers

Where can you find quality resources for STEM activities that will awaken within your students an enthusiasm to pursue a STEM career? Hands-on activities and resources from “classrooms without walls” such as museums, aquariums, technology centers, nature centers and research facilities provide an opportunity for students to gain field experience and become inspired by scientists and educators. This session will highlight academic year programs and resources available to student and teachers through these types of institutions. These programs offer classroom support and/or visit to the museums/aquarium, in-service professional development and support resources. The programs are comprehensive programs that include multiple contact hours between the informal institution and the schools.

Moderator: Sandra Ryack-Bell, Executive Director, Museum Institute for Teaching Science

Panelists: Jayshree Oberoi, Director, Teacher Resources, New England Aquarium

Maria Mingalone, Director of Interpretation, The Berkshire Museum

Annette Sawyer, Director of Education, Museum of Science

Rachel Stronach, Education Director, Lloyd Center for the Environment

1:30 – 3:00 Afternoon Break-out Sessions, Continued

Strand 7: STEM Education and the Future of the Massachusetts Economy – An Open Discussion

This session will report out on the ideas and strategies that emerged from a morning meeting of the STEM Leadership-Employer Alliance. This meeting focused on identifying gaps, redundancies, challenges and opportunities in STEM education in Massachusetts. Facilitators will review what was discussed, and where consensus was formed, lead attendees in furthering the conversation, and gather additional recommendations.

Facilitators: Ellen J. Ferraro, PhD, Deputy Director System Validation Test and Analysis Directorate,
Raytheon Integrated Defense Systems

Deborah Boisvert, Executive Director, BATEC, UMass Boston

Greg Sheldon, Sheldon Collaborative

3:00 – 3:30 Coffee, Cookies & Networking

Thank you for participating in STEM Summit VI!

Materials from this year's Summit, including handouts from break-out sessions, will be posted to our website:

<http://www.donahue.umassp.edu/stem/>