

Sponsored by  
Sankofa Community Development Corporation

2ND ANNUAL  
**STEM**  
CONFERENCE  
and EXPO

**MARCH 3, 2012**

New Psalmist Baptist Church,  
6020 Marian Drive, Baltimore, MD 21215

# Contents

<b>Letter from the Committee</b>	<b>2</b>
<b>Schedule of Events</b>	<b>3</b>
<b>Student Workshops</b>	<b>4</b>
<b>Bio of Keynote Speaker</b>	<b>5</b>
<b>Middle School Workshops</b>	<b>6</b>
<b>High School Workshops</b>	<b>8</b>
<b>Parent Seminar</b>	<b>11</b>
<b>List of Sponsors</b>	<b>12</b>
<b>STEM Fair and Exhibit</b>	<b>13</b>



# Letter from the Committee

**O**n behalf of the Sankofa Community Development Corporation and the STEMcx Planning Committee, welcome to our 2nd Annual Science, Technology, Engineering, and Math Conference and Exposition! Our mission is to bring together students, parents, and STEM professionals to highlight the importance of education in the STEM fields, and ultimately broaden and stimulate the minds of our youth. We realize that every opportunity to engage our youth in the areas of science, technology, engineering, and math is a chance to prepare them for the realities of tomorrow.

Special thanks to keynote speaker Mr. Robert Curbeam, Jr., who is a Baltimore native and Woodlawn alum. Mr. Curbeam is currently the Vice President, Mission Assurance, for Raytheon Company's Integrated Defense Systems (IDS). Prior to Raytheon, he had over 23 years of naval service logging more than 3,000 flight hours in 25 different aircraft and spacecraft. He is probably best known for his time as an astronaut with NASA, where he served on three space shuttle missions and seven spacewalks.

Congratulations and special thanks to everyone at The New Psalmist Baptist Church ~ Holy City of Zion for their hospitality in hosting the event. In this year's State of the Union address, President Obama began by asking us to "Think about the America within our reach: A country that leads the world in educating its people. An America that attracts a new generation of high-tech manufacturing and high-paying jobs. A future where we're in control of our own energy, and our security and prosperity aren't so tied to unstable parts of the world. An economy built to last, where hard work pays off, and responsibility is rewarded." We know that for those goals to become reality we must be a part of an education system that raises standards, dramatically improves STEM achievements, and reinvigorates our students.

This conference and expo addresses a few of those lofty goals. Thanks to our distinguished guests, workshop facilitators, teachers, exhibitors, volunteers, and parents. We are grateful to our sponsors for their partnership, support, and likeness to our mission. Please see page 12 for a full list of sponsors. We encourage your support of these businesses and acknowledge their desire to give back to the community. Lastly, we thank you for sharing in this eventful day with us! Your attendance and participation is valued and appreciated. Let's go do science!

## STEMcx Planning Committee

Sandy Adams

Jerry Archer

Genia Loving Clash

Donald Debnam

Talib Horne

Belinda Merritt

Patrick Johnson

Rosalind Robinson-Ambrose



### Event Check in / Lobby

7:45–8:45 A.M.

Check in for the days events

### Breakfast / Banquet Hall

7:45–8:30 A.M.

Table seating is assigned according to your preselected A.M. workshop choice.

### Welcome and Logistics / Banquet Hall

8:30–8:45 A.M.

STEMcx Planning Committee

### Greetings and Introduction of Speakers / Banquet Hall

8:45–9:00 A.M.

The Honorable Stephanie C. Rawlings Blake, Mayor, City of Baltimore

### Keynote Speaker / Banquet Hall

9:00–10:00 A.M.

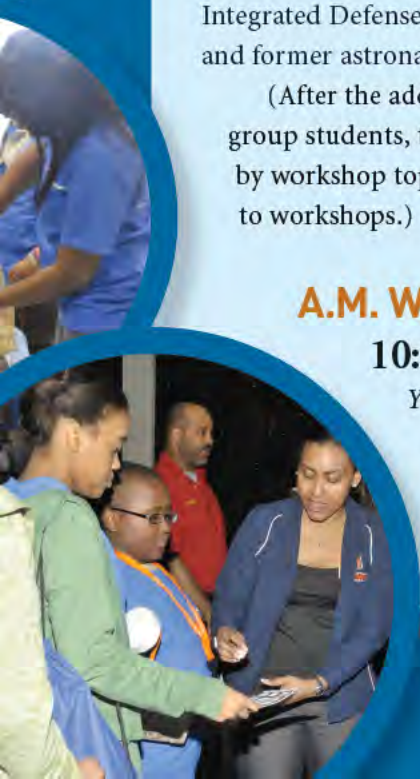
Robert Curbeam, Vice President, Mission Assurance, for Raytheon Company's Integrated Defense Systems (IDS) business, and former astronaut

(After the address volunteers will group students, teachers, and parents by workshop topics and escort them to workshops.)

### A.M. Workshop Sessions

10:15–11:45 A.M.

Your pre-selected workshops are on your name badge.



### Student Workshops

#### MIDDLE SCHOOL TRACK

Rocket Scientist and Flight

The Big Dig

A Bridge to Nowhere

The Science of Superheroes

Slam Dunk: The Physics of Basketball

Architecture 101

Shark Week

Mission Impossible

#### HIGH SCHOOL TRACK

The Physics of Football

Exploring the Universe

Beyond Our Eyes

Kinect with Microsoft:

Xbox 360 Exposed !

The Chemistry of Cover Girl

Trauma 101

Science Internships

CSI Baltimore

Alternate Energy and Cars

### Parent Seminar

Parent Seminar: Representative of The College Savings Plan of Maryland will discuss financing for higher education and Willie Little, Calvert School, Middle Grades Partnership Director will discuss standardized testing.

### Lunch / Banquet Hall

12:00–1:00 P.M.

Table seating is assigned according to your preselected P.M. workshop choice.

### P.M. Workshop Sessions

1:15–2:45 P.M.

Your pre-selected workshops are on your name badge.

### Student Workshops

Same workshop titles as A.M. sessions

### STEM Fair and Exhibit / Banquet Hall

3:00–4:30 P.M.

# Student Workshops

The colors below indicate the assigned colors for each student workshop. Students will be seated during breakfast and lunch by assigned workshop. Volunteers with flags will escort students to and from workshops.

## MIDDLE SCHOOL TRACK

- Rocket Scientist and Flight
- The Big Dig
- A Bridge to Nowhere
- The Science of Superheroes
- Slam Dunk: The Physics of Basketball
- Architecture 101
- Shark Week
- Mission Impossible

## HIGH SCHOOL TRACK

- ◐ The Physics of Football
- ◐ Exploring the Universe Beyond Our Eyes
- ◐ Kinect with Microsoft: Xbox 360 Exposed!
- ◐ The Chemistry of Cover Girl
- ◐ Trauma 101
- ◐ Science Internships
- ◐ CSI Baltimore
- ◐ Alternate Energy and Cars



# Bio of Keynote Speaker



Robert Curbeam, Jr., is Vice President, Mission Assurance, for Raytheon Company's Integrated Defense Systems (IDS) business. In this role he is responsible for the development and integration of Raytheon's Mission Assurance road map. He provides leadership across all levels of Raytheon to ensure flawless program execution and total customer satisfaction. Raytheon Company (NYSE: RTN), with 2010 sales of \$25 billion, is a technology and innovation leader specializing in defense, homeland security, and other government markets throughout the world. With headquarters in Waltham, Massachusetts, Raytheon employs 72,000 people worldwide. IDS, with 2010 sales of \$5.4 billion, is a leader in integrated air and missile defense, radar solutions, and naval combat and ship electronic systems. IDS delivers combat-proven performance against the complete spectrum of airborne and ballistic missile threats and is a world leader in large-scale radar development, technology, and production. Through world class mission systems integration and technology expertise, IDS provides defense and homeland security solutions to global customers. Headquartered in Tewksbury, Massachusetts, IDS employs a workforce of more than 14,000 employees located throughout the United States, Australia, Germany, Saudi Arabia, and the United Arab Emirates.

Curbeam is a proven leader in quality assurance, business management, and customer relations. Before joining Raytheon, Curbeam was president of the Aerospace and Defense Division for the ARES Corporation. He was responsible for business development and driving profit for nine operations. Prior to ARES, Curbeam was an astronaut with National Aeronautics and Space Administration (NASA). He held a wide range of positions with NASA as director of Safety, Reliability, and Quality Assurance for the Constellation program, deputy director of Flight Crew Operations, and Spacecraft Communicator (CAPCOM) branch chief. He was second in command for safety across NASA as the deputy associate administrator of Safety and Mission Assurance at NASA headquarters. During his tenure with NASA, Curbeam served on three space shuttle missions and seven spacewalks. Curbeam retired from the U.S. Navy with 23 years of naval service. He is a graduate of the Navy Fighter Weapons School (TOPGUN) and Navy Test Pilot School, was lead project manager officer for the F-14 Air-to-Ground Weapons Separation Flight Test Program, and logged more than 3,000 flight hours in 25 different aircraft and spacecraft. He holds an advanced degree of aeronautical and astronautical engineering and master of science degree in aeronautical engineering from the Naval Post Graduate School in Monterey, California. He received his bachelor's degree with merit in aerospace engineering from the U.S. Naval Academy in Annapolis, Maryland.

# Workshop Descriptions

## Middle School

### Rocket Scientist and Flight

*Presenter: Trena Ferrell, Maryland Education Liaison for NASA*

Students will discuss space exploration and flight science and participate in their own rocket launch.

### The Big Dig

*Presenters: David Wilcots, P.G., Environmental & Geological Consulting and Volunteer at the Public Dinosaur Lab. Academy of Natural Sciences of Philadelphia museum. Pete Yancone, Director of Education at the Maryland Science Center*

Life has been abundant on our planet Earth for over 500 million years. Fossils are evidence of ancient life preserved in rock. And fossils show us what life was around in the distant past. Come See and TOUCH fossils from many of the Earth's geologic time periods. This workshop will transport you back millions of years even back before the world of the dinosaurs. Bring your questions to the conversation. This experience will reveal the Paleontologist in you and inspire an interest in all things prehistoric. Students will handle genuine fossils.

### A Bridge to Nowhere

*Presenters: Representatives from the National Building Museum and the National Capitol Section of the American Society of Civil Engineers*

What if the Francis Scott Key Bridge did not exist? What would a civil engineer do to solve this problem? During this workshop students will become engineers and race to redesign, build, and test a bridge that is strong, looks good, and is within a budget. Are you up to the challenge?

### The Science of Superheroes

*Presenters: Gene Adams, Director of Collaborative Education, Bronx Community College, and Alex Simmons, Executive Director, The Kids' Comic Con*

Most of the classic comic book heroes such as Batman, Iron Man, Thor, Spiderman, and the Hulk are scientists in their alter egos. More than half of the superheroes and villains in the comic book world derive their powers and abilities through the sciences (biology, chemistry, energy, and technology). Through the workshop students will dissect the powers of Iron Man and other characters. What are the physics and technological principles that relate to Iron Man's costume? The characters offer students a wealth of information for discussing scientific arguments relating to energy, cybernetic, aerodynamics, and metallurgy.



## **Slam Dunk: The Physics of Basketball**

*Presenters: Presenters: Physicist and author of “The Physics of Ball”, Professor John Fontanella and a professional basketball player*

Using the laws of physics, it's possible to make a jumpshot in basketball every time! In this workshop students will learn how concepts of physics shape the game. Why does the back board break? Is there magic behind a three pointer? What is hang time? Attendees will suit up and try some of the principles on the court.

## **Architecture 101**

*Presenters: National Organization of Minority Architects at Morgan State University*

Students will discuss engineering concepts and complete small building projects with everyday edible items.

## **Shark Week in a Day**

*Presenters: Joe Barber, Director of Education Programs National Aquarium, Baltimore and researchers at the Shark Research Institute (SRI) in Princeton NJ.*

At birth the baby shark is about 5 feet long already; as it grows it may reach a length three times that! Great white sharks can swim up to speeds of 43 miles an hour and can weigh more than 4,500 pounds. Learn about common myths as you discover the characteristics that have helped sharks survive for millions of years.

## **Mission Impossible**

Your mission, should you choose to accept it, is to recover the secret code that holds the key to this briefcase. Students will be trained on basic topics of cryptography. Students will then be divided into teams. Each team will have an encrypted message in which they must diagnose the type of cryptography used and then decipher it using the appropriate cryptanalysis techniques. The success of “the Agency” depends on all teams solving their messages and then working together on one final problem to recover the secret code to the briefcase.





# Descriptions continued

## High School

### The Physics of Football

*Presenters: Dr. Sylvester James Gates, Professor of Physics and contributor to NBC Learn Series The Science of NFL Football with special appearances by Aaron Maybin of the New York Jets, Keion Carpenter, retired Atlanta Falcon and Bryant Johnson of the Houston Texans.* Did you know that if a runner is hit exactly at his center of mass, he will not rotate, but instead will be driven in the direction of the tackle? When you throw a football across the yard to your friend, you are using physics. You make adjustments for all the factors, such as distance, wind and the weight of the ball. The farther away your friend is, the harder you have to throw the ball, or the steeper the angle of your throw. In this workshop you will learn how the laws of physics can explain and improve your game.

### Exploring the Universe Beyond Our Eyes

*Presenters: Staff from the Johns Hopkins Space Telescope Science Institute* Ever wonder how we explore the universe and find black holes, colliding galaxies, or other worlds beyond our own? Do you know that astronomers explore the universe by studying all kinds of light? In this workshop you will learn how light and space telescopes are used as tools in astronomy and discover that there is more to light than meets the eye. Join us to discover how the fingerprints of light help to uncover the universe's greatest mysteries.

### Kinect with Microsoft: Xbox 360 Exposed!

*Presenters: Representatives of the Microsoft* Are you a gamer and love playing with Xbox360 Kinect? Join the Microsoft Kinect Engineers to experience the inner-workings of the Kinect Gaming Unit. Learn about the science behind the fastest-selling consumer electronic device and discover how Kinect can guess your next move. Bring your gaming skills, we will put them to the test in this session!

### The Chemistry of Cover Girl

*Presenters: Procter and Gamble Scientists and Nnenna Agba from season 6 of America's Next Top Model.* Students will discover the science involved in the development of cosmetics and will learn about the science of color and cosmetic formulation through presentations and hands-on demonstrations.

### Trauma 101

*Presenters: Health Professionals at LifeBridge Health and Dr. Miles Harrison, Division Head, General Surgery at Maryland General Hospital*

A workshop discussing the fundamentals of surgery and the operating room. This workshop will feature an inside look at surgery from the perspective of a Maryland General Hospital general surgeon, plus a hands-on explanation about the tools and techniques used in surgery from a contingent of surgical technologists/technicians from Sinai Hospital.



## Science Internships

*Presenters: Scientists and Engineers from the Army Educational Opportunity Program*

Students will be divided into three groups and finish three different modules. Students will make a DNA necklace, do some hydraulic engineering, and plan for personal fitness.

## CSI Baltimore

*Presenters: Letitia Etheridge, CSI Forensic Educator at the National Museum of Crime & Punishment and Dawn Johnson forensic scientist with the Montgomery County Police.*

Step into the shoes of both the forensic scientist and the detective. You'll learn how bloodstains can help investigators determine the weapon that created them, as well as how to lift a latent fingerprint, compare impression evidence, and decipher DNA profiles and handwriting. You'll also learn how detectives follow up on suspect statements and check alibis using things like witness statements and phone records. Finally, you'll have to put the evidence together and figure out what it takes to solve a case.

## Alternate Energy and Cars

*Presenter: John Murach, Director of Business Planning and Corporate Performance, BGE and a representative of The Baltimore-Washington Electric Vehicle Initiative (BEVI)*

Students will learn what we need to know about energy consumption and alternatives today—with an emphasis on alternative ways of powering a car.



# All registered attendees

**You are automatically registered to attend - free of charge –**

**“THINK BIG” on June 25th, 2012, from 11:00 a.m.–2:15p.m.  
at the Turner Auditorium.**

Several times each year, Dr. Benjamin Carson, Director of Pediatric Neurosurgery at Johns Hopkins Hospital gives “Think Big” presentations to children and adults from schools, youth groups, and camps. During these 75-minute slide show presentations, Dr. Carson discusses his career as a surgeon, other medical careers, and his philosophies on life and success.



### ***Who is Dr. Benjamin Carson?***

Benjamin S. Carson, Sr., M.D., had a childhood dream of becoming a physician. Growing up in a single parent home with dire poverty, poor grades, a horrible temper, and low self-esteem appeared to preclude the realization of that dream until his mother, with only a third-grade education, challenged her sons to strive for excellence. Young Ben persevered and today is a full professor of neurosurgery, oncology, plastic surgery, and pediatrics at the Johns Hopkins School of Medicine, and he has directed pediatric neurosurgery at the Johns Hopkins Children’s Center for over a quarter of a century. He became the inaugural recipient of a professorship dedicated in his name in May, 2008.

At the beginning of June the committee will email all STEMcx 2012 attendees with an admission ticket to the June event.



# Parent Seminar

This seminar will begin with a primer on the mysterious world of standardized testing. Starting in middle school, students are required to take a myriad of tests that help determine where they will be placed in high school and college. Willie Little, head of the Math Department and Middle Grade Program Manager at The Calvert School is an expert with these issues. He previously managed his own testing prep company and he will lead this discussion.

The second part of the seminar will be led by representatives of the College Savings Plan of Maryland. CSPM is the easy, affordable, and smart way to save for your child's education at nearly any college in the nation. Starting to save now is the best thing you can do to support their success in 5... 10... or 18 years. CSPM offers two distinct and flexible plans that will help you accomplish your goals and help give your child a head start. Also, it is the only 529 plans that offer a Maryland state income deduction for Maryland taxpayers.



# List of Sponsors

THE STEM COMMITTEE would like to thank the following people for their generosity in making this event a success.

T Rowe Price—Top Level Sponsor!

Northrop Grumman

Baltimore Gas and Electric

Johns Hopkins Center for Talented Youth

Anysolv Technologies, Inc.

Vaughn C. Greene Funeral Services

National Pan-Hellenic Council Inc. – Metropolitan Baltimore

VAZtech Inc.

The Hilton Inn in Pikesville

National Society of Black Engineers – Baltimore

Metropolitan Alumni (NSBE – BMAC)

Pepsi Bottling Company

Individual donors: Jerry Britton, Linda Hopkins  
and STEMcx Committee members

Thanks to Brian Barth, BRIAN BARTH DESIGN, for  
the agenda booklet and postcard design

Special thanks to New Psalmist Baptist Church for  
hosting the event.





# STEM Fair and Exhibit

Thanks to all our exhibitors!

Students-as you visit each exhibit be sure to ask questions, engage the presenters, and earn a stamp to let us know you spent some quality time! Completed STEMcx Fair Passports stamped by all exhibitors can be turned in at the close of the exhibit for a fantastic door prize!

**Some of our exciting exhibitors\* include:**

Morgan State University Actuarial Science Program

University of Baltimore

Johns Hopkins University Center for Talented Youth

National Technical Association-Baltimore Chapter

Coppin State University Upward Bound Living Classrooms

Caring for in Young Minds Foundation

FIRST Robotics of Maryland

Baltimore Zoo

NASA (SAIC)

\*Final list will be available on the day of the event!





# JOHNS HOPKINS

CENTER FOR TALENTED YOUTH

Since 1979, CTY has gathered some of the brightest students in the world for advanced academic summer camps, online courses, awards, and more. And we're right here in your hometown.

To find out how CTY can give your future scientific career a boost, visit us online at [www.cty.jhu.edu](http://www.cty.jhu.edu) or give us a call at 410-735-6278.

## Anysolv Technologies, Inc.

encourages the study of Science, Technology, Engineering and Math.

So what does it take to be a computer engineer? If you like math and science, you are off to a great start. If you enjoy discovering new things, solving problems, and learning how things work – even better!

Anysolv Technologies, Inc. is honored to sponsor events like STEMcx that expose students to many of the exciting opportunities in the wonderful world of STEM.

For more information in Anysolv Technologies, Inc [www.anysolv.com](http://www.anysolv.com)



# USA SCIENCE & ENGINEERING FESTIVAL



STEMCX'ers do not miss the largest celebration of science in the US: the 2nd USA Science & Engineering Festival will feature over 2000 fun, interactive exhibits, more than 100 stage shows and 33 Author Presentations.

The finale Expo will be held at the Walter E. Washington Convention Center in Washington DC on April 28-29, 2012. Hours are 10am-6pm on Saturday and 10am-4pm on Sunday. New this year: the USA Science & Engineering Festival Book Fair, and a Career Pavilion for high-school students that includes a College Fair, a Job Fair and a Meet the Scientist/Engineer Networking area. Major Science Celebrities including Bill Nye the Science Guy and Adam Savage and Jamie Hyneman from the hit TV Series the MythBusters will be performing. The event is open to all ages and free of charge.

**NORTHROP GRUMMAN**

©2011 Northrop Grumman Systems Corporation

*Learning makes us all grow.*


[www.northropgrumman.com/escommunity](http://www.northropgrumman.com/escommunity)

- ▼ Northrop Grumman believes in supporting science and technology through education. Because when you give in the classroom, the whole world benefits.





The "Divine Nine" Members of the  
**National Pan-Hellenic Council, Inc.**  
 of  
**Metropolitan Baltimore**  
 wishes to congratulate the  
**Sankofa Community  
 Development Corporation**  
 & the  
**2012 STEMcx Board**  
 on their second of many  
 successful educational events  
 and hopes for  
 continued success  
 in all that you do  
**"Serve the Community".**



John Berkley, President  
 Cleavon Bryant, Vice President  
[www.wix.com/nphcmetrobalto/nphc](http://www.wix.com/nphcmetrobalto/nphc)

Vaughn C. Greene Funeral Services  
 is proud to be a sponsor for the  
 STEMcx 2012 conference

We believe in a new generation of quality  
 and in our experience promoting  
 educational excellence is one of the best  
 investments we can make for the future.



ENVIRONMENT  
 COMMUNITY  
**SMARTENERGY > EDUCATION**

Preparing the next generation of scientists, technologists, engineers and mathematicians begins when they get charged up about what the future holds. That's why BGE is proud to participate in programs that enlighten, inspire and educate the youth in our community about today's energy innovations—like alternative fuel and electric vehicles, smart grid and other technologies that will power generations to come. Now that's smart energy. To learn more, visit [BGE.COM/SMARTENERGY](http://BGE.COM/SMARTENERGY)



**CREATING THE FUTURE OF ENERGY together**

Investing in our youth  
*means investing in the future*



Supporting STEMcx and  
career exploration for youth.

T. ROWE PRICE FOUNDATION, INC.