

## College Prep 101

**College Prep 101 (CP101)** was an eleven week summer program offered through Maryland MESA to help students prepare for college. The program encompassed a variety of activities, including SAT preparation, college application guidance, financial aid, college visits, and inspirational speakers. The goal of the program was to prepare the students for success in high school, college, and beyond. Since approximately 45% of students do not graduate from a four-year college within six years, CP101 extensively covered the mechanics of preparing for college, but also focused on success in college, motivation, and exposing the students to STEM fields

The program was run entirely by volunteers, primarily STEM professionals, with the generous support of the Maryland MESA Central Office and the Johns Hopkins University Applied Physics Laboratory (JHU/APL) Diversity Team. William Gray and Karla Roncal, both JHU/APL Electrical Engineers, were the instructors for the course. Additionally, twenty-five JHU/APL employees and other community members volunteered their time to make the program a success.

The students who were part of the CP101 program were diverse in many ways, encompassing a wide-variety of backgrounds, academic records, and experiences. Forty-six percent of students accepted to the program would be the first in their families to graduate from a four-year college. Many of the students had compelling personal stories including: balancing school with a full-time job, helping to take care of six brothers and sisters while their mom battled breast cancer, and teen pregnancy. Instructors of the program saw dramatic improvement and benefit for students dealing with limited financial resources, incomplete information about college, or a lack of encouragement at home. All of the surveys, testing, and anecdotal evidence showed that CP101 was very successful. ■

### PARTICIPANTS OF COLLEGE PREP 101



Students participated in an eleven week MESA Summer Academy program that addressed college readiness.



CP101 students received support with SAT preparation and the financial aid and college application processes.

## Calculator-Controlled Robots



**Baltimore teachers** were engaged in the Calculator-Controlled Robot training offered by Norma Boyd, MESA Regional Coordinator for Baltimore City Public Schools. Tyson Tuchscherer, of the Computer

Sciences Corporation (on contract to the Naval Surface Warfare Center, Carderock Division), conducted the session.

In this training, teachers created programs in TI-BASIC to run Norland Research calculator robots. Missions were

built sequentially on the knowledge of previous activities. The first missions have step-by-step programming instructions that gradually lead students to create their own programs in later missions. Students use and apply math and science concepts to direct their robots through a variety of challenges.

The Calculator-Controlled Robotics demonstration will be introduced to students during the MESA State Competition and the program is expected to be established in several MESA schools in the following year. It is hoped this will stimulate the students to use their mathematical skills in new, imaginative ways. ■



MESA Coordinator and Hebbville Elementary School Teacher, Darnell Peaker, was named the 2009 Outstanding Maryland Teacher of the Year. She was presented with a plaque and a check for \$500.00.

Peaker is a fourth grade teacher and has worked in the Baltimore County Public School System for the

past 39 years. She was recognized for her dedication and willingness to help to prepare Maryland students for the rigors of university study by enriching students in the areas of science, mathematics, technology, communications and engineering.

Peaker, who has been involved with MESA for 13

years, believes the program is “a well organized program that allows [her] to enrich, expose, and extend math and science concepts beyond the school curriculum.” She shares that a key to running a successful program is her enthusiasm for math, science, and MESA. Providing a structured program that promotes parent involvement, provides a variety of engaging learning activities and includes consistent weekly meetings also contribute to the success of her program.

Peaker explains that what she enjoys most about working with MESA students is her students’ excitement and commitment toward learning science and mathematics. Her students are eager to participate in MESA each year. When she is not teaching or advising MESA students, Peaker enjoys watching college and NBA basketball, exercising, and reading good books. ■

## MESA Students Tour APL

The JHU/APL, who has been involved with MESA since its beginnings in 1976, hosted tours for 71 Maryland MESA students and 14 coordinators and chaperones from Atholton High School in Howard County, La Plata High School in Charles County, and Sollers Point Technical High School in Baltimore County.

During this event, the Applied Information Sciences Department (AISD) showcased the Air Traffic Surveillance System and the Air and Missile Defense Department (AMDD) showed Surface Warfare Gun modeling and Ballistic Missile Defense Technology. The Global Engagement Department highlighted its Virtual Learning Environment and Lunar Lander systems engineering prototype, a tool designed to provide 360-degree representation of the Lunar South Pole.

The Technical Services Department’s (TSD) Engineering, Design and Fabrication (EDF) tour focused on several services provided by EDF that support numerous APL Programs and Departments. This included the Computer Aided Design and Manufacturing (Pro-Engineer & Solid Works) tools, the Prosthetics Laboratory, and Laser Cutting Center.

### APL TOURS



**Students toured the Technical Services Department’s Materials Testing Lab at APL.**

APL and Maryland MESA host tours for Maryland high school students each year and its success is accredited to over 50 APL volunteers that support this event. ■

## DIRECTOR’S CORNER



Welcome to our first edition of MESA Matters! This newsletter serves as a communication tool to let you know the difference we are making in the community with our students and teachers. Maryland MESA is dedicated to supporting and developing the interests, skills and abilities of K-12 students in science, technology, engineering and mathematics. Our goal is to increase the number of pre-college youth that select a STEM area of

study as they seek higher education. We are also the driving force in Maryland that encourages and assists members of the

underrepresented populations in achieving academic excellence and professional success in the STEM areas. We continue to strive towards our vision of providing a superior program which enables the students of Maryland to achieve their full potential especially in STEM careers.

I look forward to sharing information about the MD MESA program and the upcoming career opportunities in STEM, and highlighting our students and teachers.

*Paula H. Shelton*

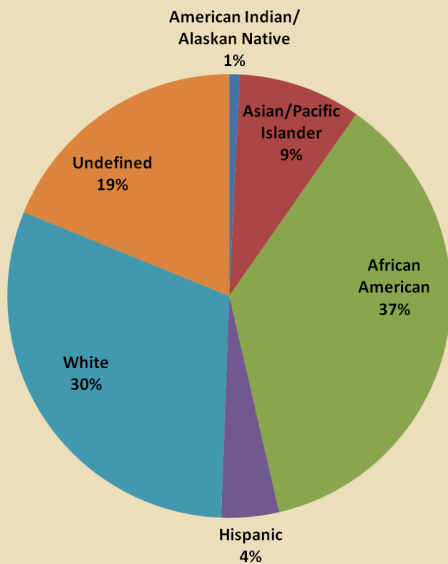
Paula H. Shelton, Executive Director

# MD MESA *by the numbers*

## 2008-2009 MESA Students Served

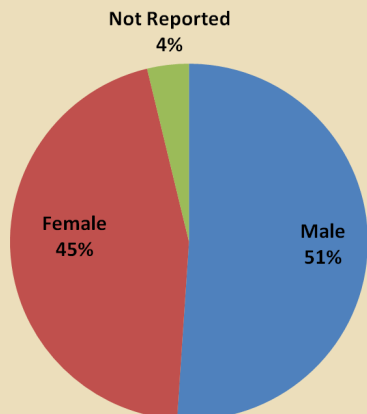
**School Districts Served: 11**  
**Schools Served: 144**  
 Elementary - 61  
 Middle - 52  
 High - 31  
**Total Number of Students Served: 3,102**

## 2008-2009 MESA Students by Ethnicity



**Percentage of underserved student groups participating in MD MESA: 51**

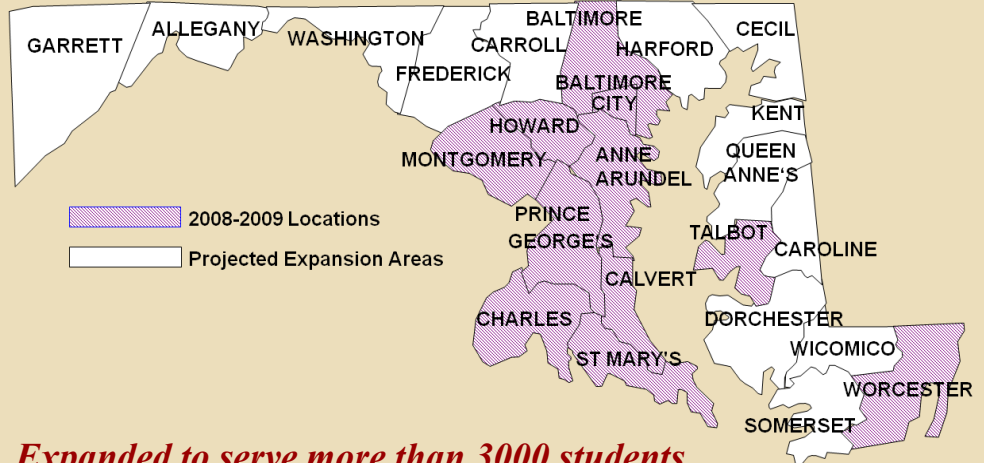
## 2008-2009 MESA Students by Gender



**Number of female students who participated in MD MESA: 1,401**

## Regions with Maryland MESA Programs

*Established in 1976 with 2 schools in Baltimore, City*



*Expanded to serve more than 3000 students in 11 Maryland School Districts.*

## 2008-2009 High School Seniors Academic Major Choices

**Percentage of 2008-2009 graduating seniors who expect to major in science, engineering, or math related career field: 57**

Engineering	34%	Architecture	<1%
Undecided	25%	Auto Mechanics	<1%
Biology/Biochem	8%	Child care	<1%
Pre Med & Pre Vet	6%	Communications	<1%
Education	5%	Econ Poli Sci	<1%
Business	3%	Emerg Med Tech	<1%
Computer Science	3%	Foreign Language	<1%
Nursing	2%	Forensics	<1%
Graphic Design	2%	International Relations	<1%
Pre Law/Crim Justice	2%	Math	<1%
Psychology	2%	Physical Therapy	<1%

\*All values were rounded to nearest whole number.

### NSBE Conference

Five outstanding MESA seniors (Emily Scheerer, Quinyardo McClain, Fatou Diabira, Yasmin Kadry, and Bradley Zayac) and two regional coordinators (Norma Boyd and Harold Williams) will be attending the National Society of Black Engineers (NSBE) Conference themed "Engineering a Global Impact" in Toronto, Canada. The conference will take place from March 31st to April 4th. This Precollege initiative provides activities to help students discover firsthand how engineering and technology relate to the world around them and experience the excitement of academic excellence, leadership, technical development and teamwork.

### Future UAV Program

The goal of the proposed Unmanned Aerial Vehicles (UAV) program is to introduce high school students to the career field of aerospace and demonstrate the utility of UAV in civilian and military situations.

The students will design, construct and operate a UAV that has the ability to save lives by delivering medical equipment to a civilian or assist a military squad by delivering much needed supplies. This project will help create a future generation of aerospace professionals-all focused on the fastest growing component of the international aerospace industry. It is expected that the program will be fully implemented in 2010 and a demonstration will be held at the MD MESA state competition.

### SeaPerch Program

Presented to the MESA program by Navy engineer, Toby Radcliffe, the SeaPerch program introduces pre-college students to the wonders of underwater robotics. This program teaches students how to build an underwater robot (called a SeaPerch), build a propulsion system, develop a controller, and investigate weight and buoyancy. This endeavor is one of many exciting new projects funded by the Office of Naval Research as part of its National Naval Responsibility Initiative. The SeaPerch program is currently in 8 MESA middle schools and is expected to expand to additional schools next year.

### MESA Partners with Capital College

Approximately 200 MESA students in grades 6-12 will attend Capital College's Cyber Battle Laboratory (CBL) programs during the Fall of 2010. During visits to CBL, students will observe a cyber security demonstration and learn about potential careers in information security and other science, technology, engineering, and math (STEM) fields. With the increased demand for workers trained in specialized information technology, Capital College's Cyber Battle Laboratory outreach program is a promising approach to developing students' awareness and interest in pursuing cyber security career fields.

## ALUMNI UPDATE



**Niquia Spencer, Project Manager  
JHU/APL**

### Alumni Q & A

**Q:** When were you involved in MESA?

**A:** I began my involvement with MESA while attending Baltimore Polytechnic Institute in Baltimore City.

**Q:** How did MESA help you? Was there something MESA offered that particularly helped you with your classes or major?

**A:** MESA helped expose me to different people with STEM careers. I also had the opportunity to travel to several different college campuses across the country. Participating in MESA helped me to meet up with my peers to discuss and get assistance with my class work. My course work at Poly was very heavy in math and science courses such as Calculus, AP Chemistry and Genetics. Through, MESA I was awarded a 4-year scholarship from the NASA Space Consortium.

**Q:** When did you graduate and what was your degree in?

**A:** I graduated from Baltimore Polytechnic in 1995 and began my undergraduate studies at Morgan State University. In 1999, I completed my Bachelor's degree in Information Systems at University of Maryland Baltimore County. In 2004 I completed my Masters in Information Systems and Telecommunications

at the Johns Hopkins University.

**Q:** Where do you work and what is your role? Do you have any future career, professional development, or educational plans that you would like to share?

**A:** I am currently a Project Manager in the Information Technology (IT) department for Johns Hopkins Applied Physics Laboratory. My next career goal will be to acquire my Project Manager Institute (PMI) Project Manager Professional Certificate.

**Q:** What advice do you give students in math, science or engineering fields?

**A:** For those that are interested in STEM careers, taking advanced mathematics and science courses in high school will help prepare you well in advance of college. Having exposure to these courses in high school will make taking them in college much easier. In addition to math and science courses, having a foundation in English and Grammar, will also be a great benefit.

**Q:** Were you the first person in your family to go to college? If so, how has this experience impacted you?

**A:** Although I was not the first person in my family to attend college, participating in MESA allowed me exposure to scientist and engineers that I may not have had the opportunity to meet otherwise. Participation in the MESA program as a student and later as a chaperone and judge for different activities has allowed me to gain knowledge and give back knowledge to my community.

February 2010	<p>18 - Precollege Career Fair for Elementary School Students at the Maryland Science Center</p> <p>19 - Precollege Career Fair for Middle &amp; High School Students at the Baltimore Convention Center</p>
March 2010	<p>4 - Regional Coordinator's Meeting</p> <p>14 - Girl Power: Changing the Face of STEM at the Kossiakoff Center at JHU/APL</p> <p>26 - Eastern Shore (Talbot &amp; Worcester Counties) Regional MESA Day</p> <p>29 - <b>Scholarship Applications Due</b></p> <p>29 - <b>Nominations for Teacher &amp; Student of the Year Due</b></p> <p>31 to April 4 - National Society of Black Engineers (NSBE) Conference in Toronto, Canada</p>
April 2010	<p>1 - Regional Coordinator's Meeting</p> <p>12 - Charles County Elementary Regional MESA Day</p> <p>15 - Calvert County &amp; St. Mary's County Elementary Regional MESA Day</p> <p>16 - Calvert County &amp; St. Mary's County Middle &amp; High Regional MESA Day</p> <p>19 - Anne Arundel County &amp; Montgomery County Regional MESA Day</p> <p>20 - Charles County Middle &amp; High MESA Day</p> <p>21 - Howard County MESA Day</p> <p>23 - Baltimore City &amp; Baltimore County Regional MESA Day</p> <p>24 - Recruiting Rising Seniors Workshop at Kossiakoff Center at JHU/APL</p> <p>26 - <b>Third Quarter Grades Due</b></p>
May 2010	<p>3 - <b>Statewide MESA Day at the Kossiakoff Center at JHU/APL</b></p> <p>6 - Regional Coordinator's Meeting</p> <p>24 - Memorial Day</p>
June 2010	<p>3 - Regional Coordinator's Meeting</p> <p>24-27 - <b>MESA USA Competitions in Denver, CO</b></p>

## Montgomery College Opens MESA Chapter

MESA recently opened a chapter at Montgomery College. The idea was to form a stronger partnership between the secondary schools and the community college and to give MESA students somewhere to go after they completed high school. Working directly with Montgomery College's engineering department, the regional director, Lisa Carvalho; MESA's Executive Director, Paula Shelton; and business partner, Toby Ratcliffe, an engineer from the Naval Surface Warfare Center, formed the partnership based on the win-win opportunities that MESA could provide.

With Toby's help, the college's engineering students were trained on the SeaPerch, an unmanned underwater

remote controlled vehicle. The college students have already sponsored a workshop for middle school students, and are planning another one for next month. Engineering student ambassadors from Montgomery College will also be going out into the schools to tutor elementary and secondary school students in the MESA program, share their knowledge of engineering, math, and science, and assist teachers and students with MESA challenges. Through this partnership, the college students will gain valuable experience, and the young MESA students will learn about college and what it takes to get into a college engineering program. ■

**2009-2010 School Districts**

- Anne Arundel County Public Schools
- Baltimore City Public Schools
- Baltimore County Public Schools
- Calvert County Public Schools
- Charles County Public Schools
- Howard County Public Schools
- Montgomery County Public Schools
- St. Mary's County Public Schools
- Talbot County Public Schools
- Worcester County Public Schools

**Universities/Community Colleges**

- Capitol College
- Howard Community College
- Montgomery College
- Morgan State University
- University of Maryland Baltimore County
- University of Maryland College Park
- University of Maryland Eastern Shore
- University of Rochester

**Business/Industry/Foundation**

- Alliant Techsystems (ATK)
- Black & Decker Corporation
- Career Communications Group
- Lockheed Martin
- Northrop Grumman

**Communities/Government/Professional Organizations**

- American Institute of Aeronautics and Astronauts
- Baltimore Museum of Industry
- Biomedical Engineering Society
- Chesapeake Bay Roost
- Johns Hopkins University Applied Physics Laboratory
- Maryland Science Center
- Maryland Space Grant Consortium
- Maryland State Department of Education
- National Aquarium in Baltimore
- National Defense Education Program
- National Society of Black Engineers
- Naval Surface Warfare Center
- Office of Naval Research
- United Way of Central Maryland

**YOUR SUPPORT MATTERS**

Maryland Mathematics, Engineering & Science Achievement (MESA) is a youth program that depends on support from businesses, sponsor organizations and volunteers to be successful in meeting its objectives.

Over the years, Maryland MESA has faced challenging demands and new opportunities. In order to keep up with the demands and take advantage of the opportunities, particularly in these economic times, MESA needs an ongoing commitment of resources and support. Here are some of the ways you can be a part of this rewarding youth program.

- Sponsor Maryland MESA events, activities, or trips
- Sponsor regional and statewide MESA Days, prizes and awards
- Sponsor a MESA competition and the research involved
- Volunteer at one of the MESA events
- Serve as a tutor or mentor to students in the program
- Publicly endorse the program and its activities
- Host site visits or competitions
- Present or conduct a workshop at the annual Teachers' Workshop, Black Engineer of the Year Precollege Fair, or at a participating school
- Contribute resources such as supplies, technical expertise, or time
- Join the MESA Advisory Board

By giving to Maryland MESA, you support America's future scientists and engineers; encourage a diverse population of youth to become interested in math, science, engineering, and technology where they are often underrepresented; aid in addressing skill gaps in these fields; and provide activities and events which contribute to and enhance our communities.

For additional information about the MESA program and its activities, contact the Maryland MESA Central Office or visit our website.



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