STEM+Art = STEAM Workshop
Dr. Taylor currently serves as the Director, Strategic Integration and Management Division (SIMD), within the Human Exploration and Operations Mission Directorate (HEOMD), National Aeronautics Space Administration (NASA). She provides technical and programmatic leadership responsibilities and budget management for the HEOMD business portfolio. Dr. Taylor is a native of Texas but currently resided in Falls Church, Virginia. She has been the receipt of various career and community awards. She is a member of several professional organizations including the International Leadership Association, Society of Human Resources and Management, and is very active in her community supporting a number of organizations including the National Council of Negro Women (NCNW) and the Alpha Kappa Alpha Sorority. Dr. Taylor possesses a BA in Business, a MA in Public Management, and a Ph.D. in organizational leadership.
We’re raising our girls to be perfect and we’re raising our boys to be brave.

To truly innovate, we cannot leave behind half our populations. I need each of you to tell every young woman you to be comfortable with imperfection. Teach girls to be brave.

Girls become interested in so-called STEM subjects around the age of 11 and then quickly lose interest when they’re 15. 

"Mar 7, 2019

Source: STEM Gems
We need to work together to get more STEAM education into elementary schools. Because without improving STEAM education in our schools, the US is going to fall behind in the global technology race and with that goes the potential for our children’s future.
74% of girls express interest in STEM in middle school, but when choosing a college major just 0.3% of high school girls select computer science.

Women make up 47% of the U.S. workforce but make up dismal percentage of STEM fields:

- 16% of chemical engineers are women
- 12% of civil engineers are women
- 7% of mechanical engineers are women

Source: National Girls Collaborative Project and the National Science Foundation
**Workshop Description**

**STEM+Art=STEAM:** Developing Impactful programs in our communities and what they can lead to.

Data USA reports that 51.7% of engineering degrees were earned by White men in 2012. By 2017, white men earned 46.3% of engineering degrees. White women earned 10.9% of engineering degrees in 2012, a number that increased to 11.7% by 2017. Black men earned 2.8% of engineering degrees in 2012 and in 2017, with no increase or decrease. Black women saw a decline in engineering degrees earned – from 1.04% in 2012 to .93% in 2017.

STEM jobs are expected to grow by 16% in the US by 2024, compared 11% for other sectors. This workshop will share innovative ways to encourage, enhance, and strengthen students’ critical thinking skills and recognize the intersections of STEM and STEAM.
Panelists:

- **Ms. Courtney Dornell**, Executive Director, Marketing & Sales, Otis Americas
- **Pamela Ansley**, President/CEO, Clarkson Systems & Analysis, Inc.
- **Ms. Pamela A. Bakewell**, Executive Vice President and CEO the Bakewell Company/LA Sentinel and President of Sabriya’s Castle of Fun Foundation
- **Dr. Aprille J. Ericsson**, New Business Lead for the NASA Goddard Space Flight Center Instrument Systems & Technology
- **Ms. Stephanie Espy**, Founder and Executive Director, MathSP, LLC and #STEMGEMS

Agenda

- Welcome
- HerStory
- Questions & Answers
- Summary
- Recommendations
- Conclude
6 Benefits of STEAM Education

1) It encourages independent thinking – steam projects require students to think critically through projects. They apply the information they’ve learned with technology and engineering to determine best solutions.

2) It offers an interdisciplinary approach- steam education focuses on collaboration and innovation across disciplines. Science isn’t more important than engineering.

3) Steam utilizes goal-oriented learning – education that concentrates on steam is hands on and project based. When students choose a goal and stick with it, they can explore and experiment with knowledge.

4) It develops problem solving skills – creative problem solving is a strong skill to have in the job market. Many think it’s something one is either born with or not. Wit’s something educators can cultivate.

5) It engages real-world applications – steam education urges students to think outside the box and look at the bigger picture.

6) It promotes meaningful collaboration – projects in steam involve team work and thoughtful collaboration. This ultimately prepares students for real-life social and employment situations.
Considerations When Planning To Establish A STEAM Program In Your Community

1) Decide on your target group (k-3, 4-8, 9-12, ). Who are you trying to reach?
2) Know what resources are needed (budget, staff, program location, technology, materials) based on the size of your proposed group over the next 1-2 years.
3) Research and find out what grant resources and opportunities might be available.
4) Seek out and establish relationship with local businesses for donations and long-term partnerships.
5) Create and sustain a long term steam program by creating a culture around steam. Create fun competition opportunities and celebrate hose who make a difference.
6) Maximize opportunities and facilitate ways for program participants to share their success stories and spread excitement among others throughout the community (steam day open house, national steam day).
**MS. COURTNEY DORNELL** has more than 17 years of experience and has held roles in engineering, sales, product management and marketing. She describes herself as a former jet engine engineer turned marketer. She currently serves as the Marketing & Sales Executive Director for Otis Americas the world’s leading maker of people-moving products such as elevators, escalators and moving walkways. Ms. Dornell holds two bachelor’s degrees; one in physics from Spelman College, and a second in civil engineering from the Georgia Tech. She also holds an MBA from Columbia University of New York. She has been featured in Black Enterprise, Wall Street Journal and several other prominent publications.
MS. PAMELA ANSLEY has been in business for over 30 years. She is President/CEO, Clarkson Systems & Analysis, Inc., a woman-owned business in environmental consulting and residential construction. Ms. Ansley is graduate of one of the largest HBCUs in the nation, Texas Southern University, Houston, Texas where she graduated with a major in chemistry.
DR. APRILLE J. ERICSSON grew up in Brooklyn, New York City. She was the first African-American woman to earn her B. S. in Aeronautical/Astronautical Engineering at MIT in 1986. She was then awarded a M.S. in engineering from Howard University in 1992, followed by a Ph.D. in mechanical engineering, the first African-American woman to do so. Dr. Ericsson currently serves as the New Business Lead for the (NASA) Goddard Space Flight Center Instrument Systems & Technology Division. As a lead advisor and board member for the DMV NSBE Jr Chapter in Washington DC, Dr. Ericsson coaches Robotics and leads the Blacks At Microsoft partnered Code Academy for k-12 scholars. Some of her most notable speaking engagements include: The White House; Women in Engineering -South Africa- Conference; Oprah Winfrey’s Leadership Academy for Girls in South Africa; and a Nifty Fifty speaker for the USA Science & Engineering festival.
MS. PAMELA A. BAKEWELL is the Executive Vice President and Chief Operating Officer of the Bakewell Company, one of the largest African American commercial real estate development companies in the Western United States. The Bakewell Company is also the parent company of Bakewell Media, owner of the LA Sentinel and the LA Watts Times newspapers and former owner of WBOK Radio Station in New Orleans, LA. As Chief Operating Officer, Ms. Bakewell oversees the day-to-day operations of the print media companies, independent projects of The Bakewell Company and the company's premier food and family festival, Taste of Soul, the largest street festival in Los Angeles County, which reached record attendance of over 350,000 on Crenshaw Boulevard. She also co-manages real estate development and redevelopment projects of the company. Ms. Bakewell's pivotal leadership role in the growth of her family's businesses, as well as her family's legacy in civil rights advocacy, has led to her strong relationships with corporations, advertisers, retailers, small to mid-size businesses, community groups, non-profits and political leadership in the Los Angeles City and County communities.
MS. STEPHANIE ESPY is the Founder and CEO of MathSP and #STEMGEMS. She is a speaker and an author of: STEM Gems: How 44 Women Shine in Science, Technology, Engineering and Mathematics, and how You Can Too! Her articulates her mission is to empower the next generation of STEM leaders. By imparting STEM fluency – the ability to problem solve, think critically and logically, apply theory and innovate – to students, she's forging a society in which every child is motivated to create and realize his or her fullest potential. Ms. Espy earned a BS in chemical engineering from MIT, MS in chemistry from Univ. of CA, Berkeley, and an MBA from Emory Univ. in Entrepreneurship and Marketing.
STEM/STEAM Projects and Resources

1. STEMGEMSBOOK.com
2. ThinkSTEAM http://www.thinksteam4girls.org/
3. Create the Future https://ozobot.com/
5. NASA at Home https://www.nasa.gov/specials/nasaathome/index.html
6. Mars2020 STEM Toolkit
   https://www.nasa.gov/stem/nextgenstem/moon_to_mars/mars2020stemtoolkit
7. NASA STEM Stars Live Sessions
   https://www.youtube.com/playlist?list=PLTUZypZ67cdv4IpN9odKK0R4v2WngGtK7
8. Leland Melvin – Astronaut STEAM Explorer [https://www.lelandmelvin.com/steamography.html#/]


10. The Nature Conservancy
    [https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/elementary-lesson-plans/]

11. Exploratorium [https://www.exploratorium.edu/explore/activities]

12. Science Buddies [https://www.sciencebuddies.org/]

14. Government agencies
- NYC region HS Teachers. Matthew Pearce at matthew.d.pearce@nasa.gov
- NASA GSFC, formerly called the SISTER program, STEM Engagement Office

15. Universities
- UMD Women in Engineering "Appy Hour" for Prospective Students website. Becky Kenemuth at rzonies@umd.edu
- MIT Office of Engineering Outreach Programs, MOSTEC, MITES http://web.mit.edu/oeop
- NYU Tisch School of Arts, Media and Games Network (MAGNET) a new technology hub with three Tisch programs

16. Non-Profit Organization
- Chess Girls DC https://chessgirlsdc.org/
- Geek + Chique = Gique provides transformational, culturally situated STEAM learning for underserved youth. Training them to be creative problem-solvers whose interdisciplinary interests turn STEM into STEAM. Founder Danielle Olson-Getzen MIT PhD candidate (I design and build immersive media systems for education and social impact.)
- Limbitless Solutions uses 3D printing to create personalized bionics and affordable prosthetics. Former students at the University of Central Florida
17. Professional Organizations
   - NSBE Jr. and SEEK - NSBE is partnering with SWE, SHPE, Links, etc

18. K-12 Schools
   - Langdon ES, STEAM focused school, HallowSTEAM
   - Integrated Arts Academy at H.O. Wheeler School, Burlington VT

19. STEM Events
   - USA Science & Engineering festival
   - Competitions: FLL/FLL Jr, VEX/VEX IQ, Ten80, Future City, Kid Wind

20. Inspiration
   - Women@NASA https://women.nasa.gov/

21. Reports or guidelines
   - National Academies of Sciences, Engineering, and Medicine, “The Integration of the Humanities and Arts with Sciences, Engineering and Medicine in Higher Education – Branches from the Same Tree”