ASME Diversity Action Grant Report

ASME student sections that receive funding through the Diversity Action Grant (DAG) program must complete and submit this report to ASME'S DAG Review Committee by no later than June 3 of the academic year in which the support was granted. Any unused funds must be returned to ASME with the report. ASME student sections that fail to submit a timely report may not be eligible to receive DAG funding for future proposals.

The outline below is the minimum required info your report should include. Additional information regarding the project, including photographs, copies of marketing materials and additional text, may be included with this project report.

NOTE: if there are personal details you do not want included when reports are published on-line, please specify and it will be removed (i.e. names, contact info).

PICTURES: if you are including photos, please be sure to include in your email that ASME has permission to use and post the images on its website.

Date: __June 2, 2014_____

Student Section: ___Howard University_____

Student Section Chair/Contact: _____Sydney Revelle_____

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Telephone: ___(302) 345-1159_____

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ASME Student Section Advisor:____Dr. Sonya Smith_____

Address: ___2300 Sixth Street NW Washington DC 20059_____

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E-mail: __ssmith@howard.edu_____

Summary of DAG Project

ASME DAG Funding: $__700_____ Total Project Budget: $ __700_____

Partnering Organizations: ___Howard University Nanoscale Science and & Engineering Facility_____

Attendance: Total _____ Women _____ Minorities _____

ASME Section/Region Reps ____Under the Washington DC ASME Section_____

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Project Title____*The NanoExpress STEM Launch Day*_____

Project Description: *This one-day project commences the yearlong STEM program being offered during CAFÉ's Saturday Academy for their elementary and middle school students during the 2014 – 2015 academic year. This project is also planned as the first event, re-launching their STEM program in lieu of the new management change during the 2013 – 2014 academic school year. During the day, students will learn about nanotechnology through four different interactive stations; nanoparticles, micro/nanofabrication, instrument characterization science in a mobile science theme park. Howard University professors and researchers from the Nanoscale Science and Engineering Facility will also be on site for students to learn from.*

Lunch will also be provided.

Project Goal/Objective and How Achieved: *Goals of this project include,*

-Reinvigorating the love of STEM in the returning CAFÉ Saturday academy students

- Introducing and exposing the elementary and middle school CAFÉ students to a new topic in the area of STEM

- To set a high tone for interest in STEM

- Expose students to African American Engineers/those in STEM fields

-Expose to students to Howard University education

Evaluation of Program's Success:

This program will be evaluated on the following basis,

- A student survey given at the end of the NanoExpress STEM Launch Day (See Attachment). If over 50% of the responses for each question are rated above a 4, success will be determined.

-Pictures and Video will be taken of the students interacting with the mobile science theme park activities and Howard University Engineers.

Other Comments/Observations/Pertinent Info:
Upon first receiving the grant funds immediate planning went into trying to find a STEM related field trip for the students. Despite our plans outline in the application, this decision to go on a field trip more effectively satisfied our objective and could be done with the amount of monies granted. After selecting a variety of trip options and through a process of elimination, we initially planned to attend Crystal Grottoes Cavern in Boonsboro, Maryland giving students an opportunity to get exposure to STEM in a real life way, touring through formations of one of the most naturally kept caverns in the

world. The scheduled date to attend this was during the students spring break in April but because of a recent management change within CAFÉ and sick leave of the academic coordinator, paper work and field trip forms were not completed in time and therefore the trip was canceled. The leadership within CAFÉ went through an overhaul during these past few months, dismissing and hiring new help. CAFÉ is a small non-profit and therefore during this time of transition the grant money had not been spent due as a result of this change for the better of CAFE. During the month of May, Sydney Revelle, the Howard University ASME student chapter contact, spoke with the CAFÉ academic coordinator and the Howard University Professors and doctoral students working with the NanoExpress project on Howard's campus. Because the nano lab at Howard University was booked for the summer, a date was finalized for September 27th, 2014 from 10am – 2.30pm at CAFÉ Cultural Academy (2705 Queens Chapel Rd Mt. Rainier 20712). The NanoExpress is scheduled to come and expose STEM in a fun interactive way to the Saturday Academy students of CAFE. The NanoExpress is a project of NNIN (National Nanotechnology Infrastructure Network) has traveled all along the east coast educating students of all grade levels and we are exciting to bring their expertise to the students at CAFÉ!

Contact information for the NanaoExpress Lab:
Dr. James Griffin
griffin@msrce.howard.edu
(202) 437-1885

CAFÉ Academic Coordniator:
Sandhya Rajan
srajan@cafeyouth.org
(240) 535-4753

More information about the NanoExpress and the facility, which it operates under, can be found at http://www.msrce.howard.edu/nanoexpress.html and in the attachments.

Design your report visually as you see fit.

Title your file and email:

Your Student Section name, Report, DAG2014 (for example: UHawaii Report DAG2014). Abbreviate words like "university", "college", "state"; eliminate "of". Don't abbreviate words like "Michigan", "Maryland" or "Missouri".
Email attachment to: diversity@asme.org

CAFÉ Saturday Academy Student Evaluation Post-Event Survey

Name:

Event: The NanoExpress STEM Launch Day

Rate the following by circling your choice:

1. I enjoyed the activities during today's NanoExpress STEM Launch Day

(Poor☹) 1 2 3 4 5 6 7 (Great!)

2. I learned something new related to science, technology, engineering and/or mathematics today (also called STEM).

(Poor☹) 1 2 3 4 5 6 7 (Great!)

3. I would like to continue doing science, technology, engineering and/or mathematic activities during Saturday's academic morning session.

(Poor☹) 1 2 3 4 5 6 7 (Great!)

4. For returning CAFÉ students only,

After today's launch event I am looking forward to the STEM program at CAFÉ's Saturday Academy this school year.

(Poor☹) 1 2 3 4 5 6 7 (Great!)

5. Additional Comments You May Have:

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Information to be covered during the launch day:

A Nanotechnology Primer

by: G.L.Harris and J.A.Griffin

Cancer and the way in which we treat cancer is about to change forever. Imagine if you were informed when the first cell in your body became cancerous. Doctors could almost guarantee a speedy recovery and cure. Nanotechnology will allow us to act on information like this.

Today the heart of a computer is based on what is called transistor technology and building these transistors require "top down" technology (carving transistors out of pieces of silicon using lithography techniques). How about assembling computers using individual molecules and atoms? Clearly, these computers would be smaller and thereby faster.

Specific manipulation of surfaces for new effects and improvement of surface properties are leading to corrosion protection (the deterioration caused by chemical reaction with the environment), affects materials as different as structural metals, ceramics, and wood, as well as works of art and artifacts from past civilizations), abrasion resistance (no superficial damage to the surface at all), photo-catalysis (this technique utilizes nano-size particles to carry out oxidation to disassemble volatile organic compound into common gases), and antigraffti surfaces (surfaces that can't be painted or written on) that have added new functionality though nanotechnology.

Nanotechnology is the understanding and control of matter at dimensions of roughly 1 to 100 nanometers, where unique phenomena enable novel applications[1]. A nanometer is one billionth of a meter. The prefix " nano" comes from a Greek word meaning dwarf. Encompassing nanoscale science, engineering and technology, nanotechnology involves imaging, measuring, modeling, and manipulating matter at this length scale. There is no field of science and engineering that is not impacted my nanotechnology. Atoms and molecules are the building block of all matter.

Matter

"Atoms are letters. Molecules are the words.[2]" All stuff or matter is composed of atoms. Matter is defined as anything that has mass and occupies space. There are three basic forms of matter: solid, liquid and gas. Solids include things like glass, metal, stones and rocks. They are fixed in shape and occupy space. Liquids such as water, soda, oil and alcohol also occupy space, but their shape changes depending on the shape of the vessel they are stored in. Gases such as air, helium, and natural gas seem to occupy no space, but they have both mass and volume. To make things interesting, some things like water commonly exist in all three forms or states (water, ice and steam).

The unique character of the way matter reacts with other matter is due to their properties. These properties are grouped into two classes: physical and chemical. Physical properties are special characteristics that make up the physical composition of a sample. These properties can also change at the nano level. Physical properties include: form, density, thermal and electrical conductivity, melting and boiling point, etc.

Chemical properties are those characteristics that focus on the substance's behavior when mixed with different elements or compounds. Chemical properties are also a function of the size of the elements. Nanosize particles react differently. Size and scale often affect how matter behaves in surprising

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The NanoExpress Where nano is BIG!

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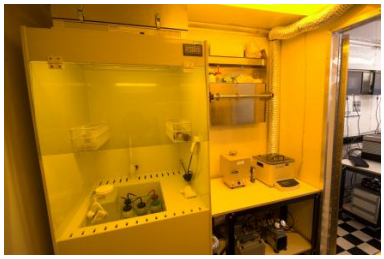

"People can't do what they can't imagine". The **NanoExpress** is about expanding the scientific imagination of people from K to Grey. The **NanoExpress** is a mobile science theme park exhibiting some of the latest science and technology at the nano dimension in a variety of disciplines. The **NanoExpress** is part of a major campaign designed to provide information on the current state of research and development in nanotechnology. It also aims to promote the dialogue between the world of science and the general public. What is nanotechnology? The study and applications of things or structures that are less than one hundred nanometers (1 nanometer = 10^{-9} meters or one-billionth of a meter) in size. Essentially this is the study of the "super small." Length scale comparisons: diameter of human hair ~ 100 μm or 100,000 nm.

The **NanoExpress** is sponsored by the National Science Foundation through the National Nanotechnology Infrastructure Network (NNIN) and several major corporations. NNIN seeks to enable rapid advancements in science, engineering and technology at the nano-scale by efficient access to nanotechnology infrastructure (user facility). Some other programs of NNIN include : Research Experience for Teachers, Research Experience for Undergraduate, Nanotechnology Boot Camp for Teachers, Nanotechnology Boot Camps for Kids and user based research facility at 13 sites across the country (www.nnin.org).

The NanoExpress has four experimental areas: nanoparticles, micro/nanofabrication, instrument for nanoscience, and characterization science. Visitors can take a closer look at the basic principles, applications and future prospects of this innovative science or, depending on what the individual groups are most interested in, they can also choose to obtain more information on a specific subject area and get involved in real hands on nanotechnology experiments. Visitors also have an opportunity to ask the NanoExpress scientists on hand any questions they might have and to involve them in more in-depth discussions.

The world of nanotechnology offers more accurate medical diagnosis procedures, lighter vehicles with lower fuel consumption, more powerful PCs and handheld devices, lighting based on nanosized layers, socks that don't sink, and much more.

Howard University

Are you interested in featuring the NanoExpress as a highlight at your event? If so contact HNF. www.msrce.howard.edu