STANYS FALL REGIONAL SCIENCE CONFERENCE
MONDAY, OCTOBER 16TH
HOFSTRA UNIVERSITY – MACK STUDENT CENTER
WORKSHOP DESCRIPTIONS

SESSION A: 9:50AM – 11:00AM

1

NGSS 101: Fundamentals in the NYSSLS *Glen Cochrane, Past-President STANYS*

This will be a brief review of the most significant fundamental shifts for teaching and learning science with our New York State Science Learning Standards. Unlike our current Core Curriculum Guides and science assessments, they are a set of performance expectations that involve the three dimensions of Science & Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas. This will be a paradigm shift to students constructing knowledge and doing science by pursuing engaging phenomena. We will review strategies to unpack the performance expectations and the coherent nature of these standards throughout the grades. Sample 3D assessments and resources to begin implementation will be provided.

2

Teach Students to Ask Their Own STEM Questions: Introduction to QFT *Kathleen Agnello & Christine Murphy*

One of the Science & Engineering Practices centers on the students asking their own questions about the real world. Participants will experience the Question Formulation Technique (QFT) themselves, see examples of how the QFT is used in science classrooms, explore how the QFT address the NGSS and this Science & Engineering Practice, and learn more about how the QFT benefits student learning. Participants will identify ways they can implement the QFT immediately to teach their students how to ask their own questions that will ignite their own STEM curiosity and investigation.

3

Writing and Aligning Curriculum to the NYSSLS/NGSS: How Do I Do This? *Emily Kang, Adelphi University*

This is a double session workshop for Session A & Session B. The new science standards are here. What should my curriculum look like based on the three dimensions of learning? How do I lesson plan for this? This workshop will provide practical steps towards answering these questions. Sample lessons, units and investigations will be shared. Particular emphasis will be paid to supporting academic language development for all learners, particularly English language learners. Participants are encouraged to bring their existing curriculum to practice redesigning lessons.

4

HHMI Presents: Data Points – A Deeper Dive *David Knuffke, Deer Park Schools*

BioInteractive's Data Points are a monthly series that features a graph or figure from a scientific journal article for students to interpret and discuss as a class. This workshop will provide participants with an introduction to the Data Points resources and develop a series of best practices for use with students.

5

Amazing Google Earth Tricks: How to Use GE to Make Earth Science Come Alive *J. Brett Bennington, Hofstra University*

Google Earth (GE) is a powerful teaching tool for exploring the physical and cultural Earth. Embedded within GE are powerful functions that can be used to make any geographically based lesson come alive. This workshop will promote technological literacy by providing examples and hands-on experience of how GE can be used in a variety of classrooms to tour 3D landscapes, teach topographic maps, simulate sea-level rise, scale astronomical distances, and explore cities and cultural landmarks. Workshop activities will expand educators' content knowledge of Earth Science and Geography and promote the knowledge and skills necessary to provide developmentally appropriate instructional strategies.

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6 **Designing Station Labs** *Kimberly Milton, Sonja Andersen, & Gloria Gill Klesaris*

A brief overview with examples and rationale of station labs will be presented. Participants will then be able to start to design their own station labs. Please bring a laptop.

7 **Teaching Density to a Middle School Class According to NYSSLS** *Vincent Pereira, Matthew Yatsyla, & Laura Zegers*

We introduce density through a phenomena which students observe, ask questions, and then plan and carry out a series of independent investigations. Students are given cubes of various sizes and have to determine if the cubes are made up of the same material. Since density is a ratio this activity can be integrated with the math ratio unit. Students draw graphs and from them determine if an object will sink/float in a liquid. Students observe liquids of varying densities that contain objects that float on one and sink in the other liquid. Finally, students work on questions that they can ask astronauts aboard the International Space Station on the behavior of such systems under zero gravity.

8 **STEM Student Initiatives** *Angela Lukaszewski, Veronica Ade, & Joyce Hilgeman*

LISEF is open to 9-12 grade students, last year we started with 414 projects involving 512 students, from over 70 high schools, both public and private; 121 projects were invited back to Day 2 and 20 were selected to advance to Intel ISEF. The projects that are invited back to Day 2 undergo rigorous scrutiny by the LISEF Scientific Review Committee. At this workshop, you will be apprised of the new ISEF & LISEF rules, given an overview of the forms, and common pitfalls will be discussed. We hope you will join us so you can help your students, who have worked diligently on their independent project, avoid not being allowed to advance due to a rule violation.

SESSION B: 12:00PM – 1:10PM

1 **Urban Ecology** *Lisa Filippi, Hofstra University*

Come learn more about the fascinating area of research in urban-based ecology that is being conducted by professors at Hofstra University!

2 **What Does NYSSLS Look Like in the Classroom: A Tested Unit of Heat Transfer** *Anthony Rohm & Keith Millman*

This workshop will provide a sample unit that navigates the new New York State Science Learning Standards (NYSSLS). The unit will focus on bringing students through crosscutting concepts, disciplinary core ideas, and science and engineering practices. It is often difficult to imagine what a complete unit looks like and how it can be implemented in class. This unit will explore heat transfer by going from introducing vocabulary to developing models and science inquiry activities and then through engineering and applying knowledge of heat transfer in real world applications.

3 **Writing and Aligning Curriculum to the NYSSLS/NGSS: How Do I Do This?** *Emily Kang, Adelphi University*

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4 **You're In Control** *Ellen Perry & Mary Petrano*

Teachers traditionally set up labs for students with controls that always work. This leads to students not fully understanding the purpose of controls. The students will see how using controls prevents the jumping to erroneous conclusion that would take place were controls not used through the real lab experience of using a diabetic patient and blood glucose levels.

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5	**Building STEM Through Exploring Our Climate System** *Margie Turrin, Lamont-Doherty Earth Observatory* Student science learning is in age of STEM, where the method for teaching can be almost as important as the content. Engage our students in STEM science through allowing them to interact directly with the data layers presented as map visualizations. Students generate their own learning and formulate their own questions as they explore the many pathways to travel through the data. Several online resources are available to help students examine climate changes and impacts. We will combine this with our free 'Polar Explorer: Sea Level' app, a tool that allows students to interact directly with the data. We will explore these resources and lessons that have been developed around them.
6	**Integrating Cloud-Based Scientific Computing into Science Education** *Dave Biersach & Scott Bronson, BNL* Modern science requires researchers to be adept with software to solve real-world problems. Developing skills in scientific computing is rapidly becoming a compelling pathway for STEM retention in young adults. This workshop reviews open courseware developed by Brookhaven National Laboratory which educators can immediately leverage to integrate computational thinking into existing science curriculum. Based upon the latest analysis techniques used at BNL, these units have been delivered to 400+ students across Long Island. The program goal is to prepare educators to help young researchers develop a competitive advantage when seeking internships at world-class organizations.
7	**Models, Modeling, and Modeling Instruction™** *Donghong Sun, STEMteachersNYC* **This workshop is a double session for Session B & Session C.** One of the Science and Engineering Practices from NGSS is for students to construct and refine conceptual models from empirical evidence, and use them to explain and predict behaviors of systems. In this workshop, participants will experience the model development and model deployment process through a simple experiment as students. During the process and the post-activity teacher-mode discussion, participants will discover how all the science and engineering practices can be integrated into science classrooms by using a guided-inquiry instructional method called Modeling Instruction(TM). Participants will also learn ready-to-use strategies to develop student's scientific skills.
8	**Hofstra's Center for STEM Research (CSR) – Resource for NYSSLS** *J. Scott McMullen, Hofstra CSR* The CSR has utilized NSF funding to develop, study, and share a variety of STEM teaching and learning practices and materials. Projects have focused on engineering, interconnected and informal STEM education, and technological skills - useful for implementing the NYS P-12 Science Learning Standards. Participants will discuss CSR's: curriculum resources and research findings; use as a resource to expand content knowledge and the knowledge and skills necessary to provide developmentally appropriate instructional strategies and assesses student progress; and projects that teachers may utilize in their own classroom so that they can analyze, apply, and engage in their own research.

SESSION C: 1:20PM – 2:30PM

1	**Designing Formative Assessments to Align to Three-Dimensional Learning** *Joe Kracjik, CREATE for STEM Institute* Come learn about how to incorporate and develop formative assessments, aligned to the spirit of teaching according to the NGSS, that can be incorporated into your daily lesson plans. Formative assessments are key to continually assess your students' knowledge as they progress toward benchmarks associated with the Performance Expectations of the NGSS!
2	**Integrating QFT into Your Work with STEM Students** *Kathleen Agnello & Christine Murphy* **This session builds on the introductory session offered earlier in the day.** Attendees will dive deeper into the planning, lesson design, and facilitation of the Question Formulation Technique (QFT), a simple, yet powerful step-by-step process which teaches students how to ask, improve, and use their own questions. In this hands-on, active learning experience, participants will leave with a deep understanding of the strategy, tools for best practices in planning, design, and facilitation, and the ability to immediately apply the QFT with students and share it with colleagues in K-12 STEM classrooms of any level.

3

Why Are We Learning This? Teaching Waves in the Relevant Middle School Classroom *Stephanie Brunnett, Lab-Aids*

Although we live an EM waves-enabled lifestyle, most of us (middle school students included) have no idea how they actually work. Join us for an activity that's new middle level NGSS content from the new Waves unit from Issues and Physical Science from LAB-AIDS. We will explore properties of light by investigating colors of the visible spectrum and investigate the energy levels of the different colors of white light through the use of a phosphorescent material. Activities exemplify the NYSSLS and show how SEPUP embeds the research-based practices and real issues to deliver powerful content learning. Learn how the uses and risks of waves used in our technology can engage student in content.

4

Inspiring Today's Technological Student *Kimberly Libertini & John Pandolfi*

This workshop promotes technology to engage the student while simultaneously meeting the needs of a diverse set of learners. Participants will learn to improve instruction through the use of YouTube videos, integrate EDpuzzle lessons, view tools like Plickers and Kahoot!, and Recap to differentiate delivery, watch GoAnimate quick video lessons, and discover how BreakoutEDU can actively challenge students to utilize new ways of thinking. Participants will be given a brief introduction to each of these tools, and upon leaving the workshop, should be able to explore each on their own.

5

Activities that Explore Key Aspects of the Nature of Science (NOS) *Brian Horan, Northport-East Northport UFSD*

In class, our students are learning about the "big ideas" of science including Newton's laws, atomic theory, and plate tectonics. But, as students learn science content, are they also learning what science is? Developing appropriate ideas about the nature of science (NOS) is a critical aspect of becoming scientifically literate. This workshop designed to explore target aspects of NOS through hands-on group activities and discussion. This workshop will expand educators' content knowledge and the knowledge and skills necessary to provide developmentally appropriate instructional strategies. This workshop also evaluates effectiveness in improving professional practice and student learning.

6

How to Send an Experiment to Space *Marijean Scardapane, South Huntington School District*

Want to get your students excited about research and engineering? Let them design an experiment to fly to the International Space Station! In this workshop (which is designed to ensure that educators have the knowledge, skills, and opportunity to collaborate with parents, families, and other community members) we will learn how one district designed and launched an experiment that flew to the ISS through the Student Spaceflight in Education Program (a private partnership with NASA). Learn about curriculum design and funding (program is expensive, but can be offset by partnerships). This is research-based and provides educators with opportunities to analyze, apply, and engage in research.

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