

**PROFESSIONAL DEVELOPMENT WORKSHOPS****3****Science Through Story: Strategies for science communication adapted from film development**

Sara ElShafie

**3**

3

**Yes, And... Creating New Performances for Success**

Marian Rich

**3**

3

**Whose Idea Is It Anyway?**

Nancy Watt Carolyn Sealfon

**4**

4

**TEN MINUTE PRESENTATIONS****4****Mentoring Sessions at Minority Serving Institutions: Sharing Research Career Experiences with Undergraduate Students**

Sofya Borinskaya Harita Menon Suzanne Quartuccio

**4**

5

**Plane-Spotting at the Tropicana: Making Connections in a Research-Based Art Practice**

Benjamin Bray

**5**

5

**Science on the Stage: How Science Plays Are Building Interdisciplinary Bridges in the Classroom and On-Stage**

Denise Gillman

**6**

6

**Collaborative exhibitions: Insights into cutting-edge research through the visual arts**

Sara Grady Michael Kennedy Marla Seibold

**6**

6

**A Physicists Perspective on Performance Based Training for Scientists: "How can you have an opinion about the right answer?"**

Nicholas Gross

**7**

7

**Writing Science for Your Audience**

Andrea Gwosdow

**7**

7

**Intersections of Physics and Performance for Physicists of Color**

Simone Hyater-Adams

**8**

8

**Creating a collaborative community of independent scholars at the Ronin Institute**

Alexander Lancaster

**8**

8

**Talk Science to Me: A Case Study Across Bill Nye's Audiences**

Annabelle Lolinco

**8**

8

**Science (as) Culture: A multi-disciplinary highly participatory discussion format for community based scientific learning and doing**

Shane Mayack

**9**

9

**Behind the scenes at Curiosity: A web series capturing the making of a scientist**

Sunada Prabhu-Gaunkar

**9**

9

**Improvisation for Active Learning: A Work In Progress**

Stephanie Pulford

**10**

10

**STEAM Summer Camp: Service-Learning Project in The Gambia, West Africa**

Nadeene Riddick

**10**

10

**1**

<b>Computing and Cultural History: A Dialogue</b>	<b>10</b>
George Thiruvathukal David B. Dennis	11
<b>Bridging the Divide</b>	<b>12</b>
Nancy Watt	12
<b>SHARE FAIRE PRESENTATIONS</b>	<b>12</b>
<b>Teaching Science in Unconventional Settings</b>	<b>12</b>
Andrea Gwosdow	12
<b>Launching History Communication: Lessons from a Multidisciplinary Approach</b>	<b>13</b>
Eric Olson Jason Steinhauer	13
<b>Storytelling for STEM with ConnectAnd Improv</b>	<b>13</b>
Ellen Feldman Ornato	13
<b>(cancelled)</b>	<b>13</b>
Mary Tyszkiewicz	13
<b>Building Community Science: Unscripted Science Explorations</b>	<b>14</b>
Raquell Holmes Nicholas Gross Sofya Borinskaya Jennifer Novotney	14
<b>Effectiveness of Online Learning Communities to Change Student Attitudes toward IT</b>	<b>14</b>
Anu Gokhale	14
<b>Serious Play For Cross-Disciplinary Science Communication - Bringing Scientists Together Using the LEGO® Serious Play® Method</b>	<b>15</b>
Camilla Jensen	15
<b>Color and Children: A Critique of Art-Exclusionary Schooling</b>	<b>15</b>
Maria Battor	15
<b>INTERACTIVE SESSIONS</b>	<b>16</b>
<b>What is a better version of you, than you?</b>	<b>16</b>
Mia Anderson	16
<b>Sharing Your Story</b>	<b>16</b>
Neil Bardhan	16
<b>Stage Chemistry: The Science and Math in Technical Theater</b>	<b>16</b>
Anna Gelman Willa J. Taylor Brigitte Wittmer Brandi Lee Elizabeth Rice Adrian Azevedo	16
<b>Fusion Science Theater presents: How to Create a Show that fuses Science, Story, Performance, Dramatics, and Demonstrations to Promote and Assess Conceptual Learning</b>	<b>17</b>
Holly Walter Kerby	17
<b>Improvistional games for collaboration: Risk, fail, celebrate, and continue!</b>	<b>18</b>
Carolyn Kroehler	18
<b>The Art of Scientific Storytelling: Transform Your Science through Narrative Craft</b>	<b>18</b>
Rafael Luna	18
<b>Foundations I - A performatory approach to teaching, learning and technology</b>	<b>18</b>

Jim Martinez	18
<b>Organizing and Amplifying Integrated Education Resources: A Community Initiative</b>	<b>19</b>
Eric Olson	19
<b>Unpacking Unconscious Bias</b>	<b>19</b>
Ellen Feldman Ornato Jenny Drescher	19
<b>Shine</b>	<b>19</b>
Beth Osnes	19
<b>Choreographing Code: Integrating Dance &amp; Technology</b>	<b>20</b>
Emma Shockley	20

## Professional Development Workshops

### Science Through Story: Strategies for science communication adapted from film development

**Sara ElShafie**

Description:

Do you wish you could make your science as exciting as a blockbuster movie? Come learn how to engage broad audiences in science using strategies adapted from filmmakers! In this workshop developed with artists at Pixar Animation Studios and educators at the University of California Museum of Paleontology, you will learn:

- (1) Effective communication strategies grounded in narrative theory, philosophy of science, cognition research, and story art training.
- (2) How to clearly articulate your professional motivations and explain your work through these strategies.
- (3) How to use these strategies to foster inclusion in science.

The workshop alternates between presentation, group discussion, and partner exercises. Throughout the workshop, you will create and share your own story about your professional work or path. You will leave with an outline for a presentation or elevator pitch, and plenty of tools to make the most of any future communication opportunity!

Author biography:

Sara ElShafie is a doctoral candidate in Integrative Biology at the University of California, Berkeley. Her research, based at the UC Museum of Paleontology at Berkeley, investigates climate change impacts on animal communities over time. A Chicago native, Sara's childhood love of museums led to a passion for making science accessible and exciting for the masses. She is now working with artists, scientists, and educators around country to develop programs that train scientists to engage broad audiences with their work. Sara also loves film, scuba diving, traveling, and playing with her pet geckos.

### Yes, And... Creating New Performances for Success

**Marian Rich**

Description:

In this experiential professional development workshop, we will explore an improvisational, philosophical and performance approach to leadership training used in corporate settings, youth development and academia. Open to people at all professional levels. Through a series of improvisational exercises participants will have the opportunity to develop the skills to inspire and motivate others. Experience what it means to be fully present. Perform and develop confidence and the ability to keep calm under pressure. Learn to think on your feet and develop a capacity for greater spontaneity. Strengthen your ability to respond quickly and decisively to unanticipated challenges. Increase awareness of your natural tendencies (i.e., shy, talkative, etc.) while creating/discovering who you are becoming. Have fun while developing!

Author biography:

Marian Rich is the President of Career Play, Inc. As a trainer, facilitator, comic educator, and human resources professional she uses improvisation as a tool for growth. Through playful and engaging training workshops and classes, Career Play helps people develop leadership, communication and interpersonal skills, while enhancing participants' creative capabilities. Career Play Inc. provides training to a number of businesses, non-profits, and academic organizations. Marian received her training in a cutting-edge performance-based approach to human development at the East Side Institute, an international research, education and training center for new non-didactic approaches to psychology and education.

## **Whose Idea Is It Anyway?**

**Nancy Watt**  
**Carolyn Sealfon**

Description:

STEM fields value and reward the ownership of ideas. This culture does not encourage collaboration and support, and it promotes insular thinking and distrust. In this workshop, participants will develop skills for finding the best idea, without focusing on whose idea it was. The collaborative yes, and culture of improvisational theatre will teach participants how to listen, be open to new ideas, adapt, and create a safe environment for creativity. Participants will learn to appreciate the value of others, and the potential for greater innovation through collaboration. These skills will then be applied to a scientific learning exercise exploring Newton's Laws. Participants will be challenged to use both analytical and emotional skills to find a path that would otherwise be hidden.

Author biographies:

Carolyn Sealfon earned her PhD in astrophysics at the University of Pennsylvania and her BA in physics from Cornell University. She is also an alumna of the Stagedoor Manor Performing Arts Training Center and a qigong instructor certified by the Wuwei Taichi School. She assimilated physics education research while teaching and advising undergraduates as a professor at West Chester University. As Princeton University's first Associate Director of Science Education, she consulted for faculty on courses to engage all undergraduates in science and engineering. Currently based in Toronto, she strongly believes everyone can enjoy learning and applying scientific thinking.

Nancy Watt is a sought after speaker, writer and improviser. A graduate of Second City's Improv Conservatory and Sketch Writing Programs, she delivers dynamic workshops on communications and creativity in unconventional environments. Rated in the top five of the Leadership Workshops at the International Microsoft World Partner Conference and a regular at Huffington Post's team building events, Nancy delivers powerfully creative and memorable sessions. She delivers her energy, talent and humour to the corporate, education and healthcare sectors. Her work is referenced in academic papers for pedagogical experiential learning.

# **Ten Minute Presentations**

**Mentoring Sessions at Minority Serving Institutions: Sharing Research Career Experiences with Undergraduate Students**

**Sofya Borinskaya**  
**Harita Menon**  
**Suzanne Quartuccio**

Description:

A core mission of IRACDA NIH-funded postdoctoral training program is to develop a diverse group of trained scientists in the fields of biomedical research by broadening participation at the undergraduate level. However, many students are unaware of the research opportunities or are intimidated by the application process. Fellows of INSPIRE (IRACDA program at Rutgers University) developed mentoring sessions at minority-serving partner institutions focused on summer research and graduate school. We tailored the format of the session to foster conversations with students based on our and their personal experiences. I will talk about how we conduct the mentoring sessions and will share assessments, student feedback, outcomes and reflections of the fellows who lead the sessions. I will invite the audience to share resources and discuss approaches for leading undergraduate mentoring sessions. We hope to inspire others to conduct similar sessions at their institutions to enhance participation of diverse scientists in research.

Author biographies:

Sofya Borinskaya is an IRACDA postdoctoral fellow receiving training in both teaching and research at Rutgers University. She has B.S. in electrical engineering and Ph.D. in biomedical science. In graduate school, Sofya worked on interdisciplinary projects about dynamics of the actin cytoskeleton. Her postdoctoral research projects extend to investigating actin dynamics in *C. elegans* model organism. Sofya is an advocate of math education for life sciences and is interested in a career of an educator researcher at primarily undergraduate institution. She is learning how improvisation and performance enhance science education.

Harita Menon's first research experience was during her master's work in India, where studied the immune stimulating effects of yeast beta-glucan on Indian prawn under Dr. Rosamma Philip. She then pursued a Ph.D. at Worcester Polytechnic Institute, Massachusetts, under Dr. Joseph Duffy. In Duffy's lab, Harita studied the role of Kekkon5 (Kek5), a *Drosophila* LIG (Leucine Rich Repeat and Immunoglobulin domain) family member, in BMP signaling and cell adhesion. She found that these functions are governed by different extracellular and intracellular regions of Kek5. Harita joined Dr. Bonnie Firestein's lab at Rutgers for her postdoctoral training and received the INSPIRE postdoctoral training fellowship. There, she studies the effects of small peptides on dendrite branching in rat hippocampal neurons. In addition to doing research, Harita has been involved in teaching, mentoring and community outreach, as she believes that they are vital contributors to her evolution as a science scholar.

Suzanne M. Quartuccio earned her B.S. in Chemical Education and Master's in Teaching from the University of Virginia and Ph.D. in Medicinal Chemistry from the University of Illinois at Chicago. Her Ph.D. dissertation investigated the role of genetic manipulations on the initiation of ovarian cancer. Suzanne is currently a NIH IRACDA Postdoctoral Fellow, dividing her time between teaching at Medgar Evers College and researching mechanisms of aneuploidy contributing to female infertility at Rutgers University. Suzanne is committed to increasing the participation of females and other under-represented populations in science through the use of active learning strategies."

## **Plane-Spotting at the Tropicana: Making Connections in a Research-Based Art Practice**

**Benjamin Bray**

Description:

This presentation will briefly summarize key milestones in a research-based art practice involving physical science and new media. The speaker's current art practice is a function of interplay between formal studies in physical science and art, including oceanography, geopolitics, geospatial interpretations, sculpture, and installation, and involves residencies, collaborations and critiques in both art and science contexts within universities. This methodology facilitates interaction with a wide variety of audiences, but also requires the development of unique connections between the principle elements of scientific and artistic practice. These connections will be described in the context of a trajectory that began with blurry photos of unmarked commercial jets, crossed the Arctic Circle, and which currently extends into glass and global ocean circulation.

Author biography:

W. Benjamin Bray is an artist working in earth science and new media. His works range from site-specific installations in the Arctic to experimental renderings of oceanography and climate change, utilizing photos, maps, video, and often glass, ice, and water. Bray's approach generally abandons the pursuit of a formal, logical representation, and involves purposeful ventures that logical representation would discourage.

He has exhibited works in Massachusetts, New York, Rhode Island, Wisconsin, Texas, Maine and Japan and completed residencies in Svalbard, Norway and at Vermont Studio Center. Bray is the recipient of artist grants from MIT, Vermont Studio Center, Corning Museum of Glass, Artist's Resource Trust, and a research grant from the National Science Foundation. He frequently serves as Visiting Artist and Critic for the Glass Department at Massachusetts College of Art and Design.

Bray holds a MS in Atmospheric Science and Oceanography from Penn State University, and a BS in Atmospheric Science from Texas A&M University. He has studied independently at Corning Museum of Glass, Haystack Mountain School of Craft, Massachusetts College of Art and Design, and Boston University.

## **Science on the Stage: How Science Plays Are Building Interdisciplinary Bridges in the Classroom and On-Stage**

**Denise Gillman**

Description:

Young adults face vast societal and environmental challenges that will require novel, creative approaches to solve. When asked to examine a challenge from a variety of perspectives, students gain a richer understanding of problem solving processes, which illuminate an unconventional or innovative pathway forward. This presentation's goal is to share how science-themed plays are building interdisciplinary bridges in the classroom, on-stage and in the community by creating collaborative inquiry-based learning models, and launching creative research pathways. Science-themed plays awaken intellectual curiosity and understanding of complex scientific ideas and human nature within the framework of a good story. This presentation will explore these plays' use as an interdisciplinary springboard by sharing specifically crafted exercises and writing assignments and interdisciplinary production opportunities. It will also show how students' research and creative investigation of these plays have led to capstone experiences, creative research projects, and conference presentations.

Author biography:

Denise Gillman is an Associate Professor of Directing & Dramatic Literature at Christopher Newport University (CNU) in Newport News, VA. For over a decade, science-themed plays have been a major focus of her teaching, research & scholarship and both her professional and educational directing activity. At CNU, she teaches the course "Science on the Stage" which promotes interdisciplinarity between the arts, humanities and sciences. Along with directing these works, she has also given regional, national and international conference presentations about them. Ms. Gillman received the 2014 Association for Theater in Higher Education and Kennedy Center American College Theatre Festival Prize for Teaching Innovation for her work on science-themed plays.

## **Collaborative exhibitions: Insights into cutting-edge research through the visual arts**

**Sara Grady**

**Michael Kennedy**

**Marla Seibold**

Description:

The Scientific Images Contest was designed to build bridges between scientists and the wider community. Through vivid images taken in science labs, we aim to share interesting science in arresting visual formats with tens of thousands of visitors each year. But on top of that, we build exhibitions, talks, and events, to encourage dialogue and build connections between student artists and scientists, encouraging them to probe their common curiosity, practices, and approaches.

This interactive panel discussion will outline how the project works for various participants teachers, scientists, artists, and students -- sharing what this program can be, how it has worked, and how it continues to evolve to meet the needs of our community, and hopefully, to inspire other partners and conference attendees to consider how they can incorporate these conversations and approaches into their own work.

Author biographies:

Michael Kennedy is a research professor of Neurobiology at Northwestern University and the founding director of Science in Society, the university's research center for science education and public engagement. The center partners with urban K-12 teachers, administrators, and youth development agencies to create high-quality, long-term, impactful science learning opportunities for underserved youth.

Sara Grady's interests bridge the connections between science and culture, from public discourse and policy to art-science collaborations. Sara studied Interdisciplinary Engineering at the University of Michigan and earned her Masters in Cultural Studies at the University of Edinburgh in Scotland. She develops and delivers internationally renowned projects which connect people to big ideas and contemporary research. Previous partnerships include the ESRC Genomics Forum, the Edinburgh International Science Festival, and the BBC.

Marla Seibold has been teaching high school art for 23 years. She teaches ceramic and studio art at both introductory and advanced placement levels at Evanston Township High School. Her students have taken part in this program from three years now.

## **A Physicists Perspective on Performance Based Training for Scientists: “How can you have an opinion about the right answer?”**

**Nicholas Gross**

Description:

Traditional approaches to teaching science and training scientists have stressed results and the final product, while new approaches put more emphasis on process and developing community. These new approaches share elements with and can be informed by improv training and its underlying practice and ethos. Even while leading the implementation and development of these new approaches, I still sometimes respond both intellectually and emotionally in a way that questions the validity of the approaches. These responses can be, I think, typical of a traditionally trained scientist. This heretical talk will explore some of these responses as a way to open a conversation about how we might understand, and respond to these reactions in a productive manner.

Author biography:

Nicholas Gross earned his Ph.D. in physics from BU and is currently a lecturer at BU and a Visiting Scientist at the National Center for Atmospheric Research. He has been working on a variety of education projects for over a decade. Dr. Gross is recognized as an expert in the development and delivery of interactive and engaging STEM (Science, Technology, Engineering and Mathematics) education programs for a wide range of people, including: public audiences, undergraduates and graduate students in specialized workshops, and in teacher professional development.

## **Writing Science for Your Audience**

**Andrea Gwosdow**

Description:

Learn how to write and explain science materials to audiences of all ages (ages 0 to 18), the general public, and scientists. The presenter will share tips and tools to make science writing easier for audiences of all ages to understand.

Author biography:

Dr. Andrea Gwosdow is President of Gwosdow Associates Science Consultants, a science and medical communications firm that works with schools on science education, provides medical and science writing, professional development, and interprets science for non-scientists. She holds academic appointments at Harvard Medical School and Massachusetts General Hospital. Andrea is an effective medical writer who has received the top awards from the New England Chapter of the American Medical Writers Association. Andrea has worked globally to improve communication and writing skills through hands-on workshops, seminars and presentations. Andrea writes a monthly column about cutting edge research for students and the public.

## **Intersections of Physics and Performance for Physicists of Color**

### **Simone Hyater-Adams**

#### Description:

With a hypothesis that performance can aid in the effort to address the marginalization of black people in physics, this talk will overview ongoing research that examines the connections of identity, physics, and race, and present accounts of how performance is taken up in the lives of black physicists. We welcome researchers and practitioners to come and hear about preliminary work being done to examine intersections of physics identity and performance art, and methods for determining programmatic implications. Because this work is preliminary, we stress the interest in collaboration, and call for those interested in partnering and participating in future research.

#### Author biography:

Simone Hyater-Adams is a third year PhD student in the ATLAS Institute at the University of Colorado Boulder. She received her degree in physics from Hampton University in 2014, where her interest in education sparked. Now, as a physics education researcher and National Science Foundation Graduate Research Fellow, Simone is committed to doing critical work that pushes the field of physics to examine the oppressive structures within its culture. With her intersecting identities as a black woman, a physicist, and a performer, she uses this interdisciplinary graduate program to conduct research examining the experiences of black physicists.

## **Creating a collaborative community of independent scholars at the Ronin Institute**

### **Alexander Lancaster**

#### Description:

The Ronin Institute, formed in 2012, is a self-organized community of scholars from both the sciences and humanities formed with the core assumption that researchers should create their own measures of success and that affiliation with a conventional brick-and-mortar research institution should not be the sole metric of “success”. As a 501(c)3 non-profit organization the Ronin Institute provides an affiliation for scholars, as well as a financial structure whereby researchers can apply for federal and state grants. In this talk I will share our own steps in cultivating virtual science communities, such as the creation of face-to-face local meetups, participant-driven events like our first Unconference held in November 2016, as well as virtual meetings: a weekly Tuesday “watercooler” and virtual web research seminars. I look forward to learning more from other CESTEMER participants about how we can continue and extend our journey towards creating living, joyful communities of scholarship.

#### Author biography:

Alex K. Lancaster, PhD. is an evolutionary biologist, engineer, writer and consultant. He is a Research Scholar at the Ronin Institute, and a Partner at Cambridge, Massachusetts-based digital biology consulting firm, Amber Biology.

## **Talk Science to Me: A Case Study Across Bill Nye's Audiences**

### **Annabelle Lolinco**

#### Description:



Science continues to inform and advance policy decisions on myriad topics, from energy to medicine to climate change; thus, disseminating accurate scientific information is essential. Yet, we have not figured out the ways we can have a constructive conversation around scientific topics that are meaningful and enlightening. There are few who do strike a balance in educating and entertaining, and we can learn from them. Bill Nye has had a long history in entertainment, but he also strongly advocates for STEM. In this particular presentation, the focus is on how Bill Nye addresses his audience in the eponymous Bill Nye the Science Guy and The Eyes of Nye. The target audience is different, and thus his communicative rhetoric reflects that. Comparing and contrasting the shows reveals several interesting points about the public engagement with science.

Author biography:

Annabelle Lolincio is a graduate from the California State University, Fresno, with her dual degree in Biochemistry and Communication, and is attending Iowa State University for her doctoral degree in Chemistry. Being interested in both the science and humanities, grounded her interests in science communication, specifically in studying how chemists discuss, teach and communicate about their field to the public. Her work has been funded through the Ronald E. McNair Program as well as the Sally Casanova California Pre-Doctoral Program, which has prepared her to continue doing work in science communication, particularly through science policy.

### **Science (as) Culture: A multi-disciplinary highly participatory discussion format for community based scientific learning and doing**

**Shane Mayack**

Description:

"Science (as) Culture, a discussion series launched by Ligo Project using "conversation as performance project", is geared towards evolving how we think, learn, and talk about science, art, and culture. We invite discussion seeders with different perspectives, ranging the history of science, genetics, or psychology to the arts and linguistics, to embed conversations around a science-based topic, while inviting the audience to join in as peers--because oftentimes some of the best knowledge in the room is with the audience. The result is peer-to-peer informal learning that facilitates community conversations around science-based topics and connects individuals for a lean-in (vs. lean back) audience engagement experience. As a progressively global community, we need the flexibility to think and exist between multiple frames of reference. To get there, we all need a seat at the table. Come and hear what we have learned using this unique way of connecting science and community.

Author biography:

Shane Mayack is the co-founder and director of the Ligo Project, a non-profit organization with a mission to draw the sciences, arts, and other disciplines together to generate conversations and collaborations that enrich the public's understanding of and appreciation for science. Her career as a life scientist, studying the immune system and blood formation, combines more than 11 years in research, advisory, consulting, clinical, and communications strategy roles focused on innovation and advancement of science. She is currently Scientific Research Director for the Center for Hematologic Malignancies (blood cancers) at Memorial Sloan Kettering Cancer Center.

### **Behind the scenes at Curiosity: A web series capturing the making of a scientist**

**Sunada Prabhu-Gaunkar**

Description:

At STAGE Lab at the University of Chicago, we are developing a documentary-style "web series" uncovering the lives and stories of scientists, their motivations and their thinking. Our goal is to show the human side of scientists and explore their views on the intersection of science and society.

The presentation will feature excerpts from our series highlighting its unique aspects. We will also explain how the scientific and design methods have contributed to its creation.

## Author biography:

Sunanda Prabhu-Gaunkar is a scientist and product designer. She enjoys connecting with different kinds of people and listening to their stories. She has a deep academic background of scientific research with a PhD in Electrical Engineering from Northwestern University. This combined with her experiences in a dynamic product design firm, inspired her to seek opportunities at the intersection of science, design and storytelling. She is bringing these experiences together to her work at the STAGE Lab at the University of Chicago. She approaches artistic projects with scientific methodologies and strives to create successful artistic expression of scientific themes. She believes that understanding the intrinsic commonalities and differences in the two fields would lead to interesting new directions and foster stronger relationships between the two communities.

## **Improvisation for Active Learning: A Work In Progress**

### **Stephanie Pulford**

## Description:

In quasi-experiments and meta-analyses, active learning has been shown to greatly improve the learning and success of STEM students, particularly those who are traditionally underserved in higher education. Yet educators and students have been reluctant to embrace active learning, in part because of anxiety over leaving the safety of a lecture for an unscripted and interactive mode of learning. In this regard, theatrical improvisation methods provide a perfect complement to active learning. Theatrical improvisation methods undergird spontaneous performances among collaborative ensembles, productive risk taking and curiosity, and the ability to work creatively within somewhat unpredictable circumstances. In this talk I outline key steps needed to bridge improv practice and the STEM active learning community, including framework to reveal, cultivate, and measure the progress of instructor improvisation. I describe the current state of a work-in-progress to bring improv into university faculty development research and practice, in support of interactive unscripted teaching.

## Author biography:

Stephanie Pulford is the Associate Director, Instructional Research and Development at UC Davis' Center for Educational Effectiveness. Her work combines dual missions of developing and researching innovative teaching, and supporting educators to think of their classes as active laboratories for interactive, iterative innovation. Her research interests include active learning as ensemble improvisation; narrative content in technical writing; and building ensemble as a component of faculty development. Dr. Pulford's background includes computational biology, airframe structural engineering, professional editing, writing, and teaching.

## **STEAM Summer Camp: Service-Learning Project in The Gambia, West Africa**

### **Nadeene Riddick**

## Description:

Please join me to learn about a STEAM Summer Camp service-learning project in The Gambia, West Africa where we incorporated microscopy into the curriculum using revolutionary paper microscopes (foldsopes). Come marvel at the beautiful microscopy images taken by the campers and try out a foldscope for yourself!

## Author biography:

Nadeene Riddick is an American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellow at the National Science Foundation. She recently finished a postdoctoral fellowship at the National Institutes of Health and received her Ph.D. in Cell and Molecular Biology from the University of Pennsylvania where she studied HIV/SIV. Dr. Riddick has been actively involved in multiple organizations that promote informal science education and broadening participation in STEM fields.

## **Computing and Cultural History: A Dialogue**

**George Thiruvathukal**  
**David B. Dennis**

Description:

The social and organizational history of humanity is intricately entangled with the history of technology in general and the technology of information in particular. Advances in this area have often been closely involved in social and political transformations. While the contemporary period is often referred to by such names as the Computing and Information Age, this is the culmination of a series of historical transformations that have been centuries in the making. This talk will provoke attendees to learn about the incredible history of computing--and related--disciplines through the evolution of number systems and arithmetic, calculating and computing machines, and advanced communication technology via the Internet. With the growing reliance upon computing, especially in science, engineering, and mathematics domains, it is more important than ever to understand how computing was borne out of scientific and mathematical disciplines and was created, in part, as a tool to help solve these problems.

Author biographies:

George K. Thiruvathukal (PhD, Illinois Institute of Technology, 1995; MS, Illinois Institute of Technology, 1990; BA, Computer Science and Physics with Mathematics Minor, 1988) is Professor of Computer Science at Loyola University Chicago and Visiting Faculty at Argonne National Laboratory in the Mathematics and Computer Science Division, where he collaborates in high-performance distributed systems and bioinformatics.

Dr. Thiruvathukal's early research involved object-oriented approaches to parallel programming and the development of object models, languages, libraries, and tools (messaging middleware) for parallel programming, mostly based on C and C++ on Unix platforms. This work would later be redone in the Java programming language, which resulted in a book, *High-Performance Java Platform Computing*, Prentice Hall and Sun Microsystems Press, which was cited in the Java Specification Request, [JSR-166 \(Concurrency Utilities\)](#) as a related/existing work. Our book, while no longer in print, is available freely and openly at [works.bepress.com/gkthiruvathukal/26/](http://works.bepress.com/gkthiruvathukal/26/).

Dr. Thiruvathukal's research is and has been funded by grants from the National Science Foundation, DARPA, and the National Endowment for the Humanities. He has also received corporate support from Hostway Corporation in Chicago, Microsoft Corporation, Hewlett-Packard, and Typesafe.

David B. Dennis (Ph.D., UCLA, 1991; B.A., University of Wisconsin, 1984) is a Professor of History at Loyola University Chicago where he teaches courses on modern European cultural history.

Having studied with scholars such as George Mosse, Harvey Goldberg, Robert Wohl, Eugen Weber, Saul Friedlander, Robert Winter, and others, Dennis's own scholarship has focused on German cultural and political history. His *Beethoven in German Politics, 1870-1989* (Yale University Press, 1996) examines evocations and uses of Beethoven's biography and music by all of the major parties of 19th- and 20th-century German political culture. The book attracted considerable international attention and was reviewed in both scholarly and popular media, including *The New York Times*, *The Financial Times*, *The Guardian*, *The New Statesman and Society*, *the Frankfurter Allgemeine Zeitung*, *Music and Letters*, *the American Historical Review*, *the German Studies Review*, and other publications.

Dennis's most recent book *Inhumanities: Nazi Interpretations of Western Culture* (Cambridge University Press, 2012) provides an intense and comprehensive examination of the main publication of the Nazi Party, the *Völkischer Beobachter*, showing how that newspaper interpreted the History of Western culture, from the Ancient Greeks through the Weimar Era, in the context of Nazi ideology. It has received very positive critical attention from the *Times Literary Supplement*, *the Literary Review*, and other press and media outlets. He has written numerous book chapters and articles appearing in a variety of journals including, *the International Journal of Humanities*, *the Journal of Political and Military Sociology*, and *the German Studies Review*. His current interdisciplinary project, *Modern History of Computing and Its Cultures* co-authored with George Thiruvathukal, surveys the stages of computing history with critical historiographical methods and explores the relationships between these developments and their social and cultural contexts.

Dennis also served as the Graduate Program Director in the History Department from 2011-2014. He has been recognized for excellence in teaching and was a recipient of a Master Teacher Award in the College of Arts and Sciences in both 2000 and 2003. In 2010, he organized and moderated the film series *Made in West/East Germany: Chicago-wide Commemoration of the 20th*

Anniversary of German Reunification in conjunction with the Goethe-Institut Chicago, DePaul University, Northwestern University, and the University of Illinois-Chicago. In 1993, he hosted the Topography of Terror: Gestapo, SS, and Reichssicherheitshauptamt on the Prinz-Albrecht Terrain Exhibit at Loyola University, in cooperation with the Goethe-Institut Chicago and the German Consulate in Chicago.

## Bridging the Divide

### Nancy Watt

#### Description:

The value to noticing gender differences in communication is critically important to stemming the tide of women leaving the STEM fields. Long seen as soft skills, the cost of poor communication inevitably results in increased employee turnover, poor customer service, ineffective change management, failed project delivery and high litigation costs.

In this highly interactive, ten minute talk, Nancy Watt delivers the latest research regarding the issue but also illuminates the startling gender divide when it comes to communications. She does this with an original improv technique that resonates with the audience long after ten minutes. Subtle but powerful ways that women diminish their own status is mirrored against typically male styles of communication. An important discussion on improving communication to expand women's mobility in the workplace and cultivate integrity and achievement in all facets of an organization, especially the bottom line.

#### Author biography:

Nancy Watt is communications professional, writer, trainer, speaker and a graduate of Second City Comedy Improv Conservatory in Toronto. She regularly conducts dynamic and experiential learning workshops for industry, healthcare and education using the tools and techniques of improv.

## Share Faire Presentations

### Teaching Science in Unconventional Settings

#### Andrea Gwosdow

#### Description:

Learn how to plan and teach short interactive science activities to children (ages 0 to 18) and grown-ups in nonconventional settings such as museums, health fairs or family science events. Participants will experience a variety of hands-on-activities and learn the nuts and bolts of planning science events in non-traditional settings. They will learn how to engage children of all ages and other community members in science outreach.

#### Author biography:

Dr. Andrea Gwosdow is President of Gwosdow Associates Science Consultants, a science and medical communications firm that works with schools on science education, provides medical and science writing and professional development, and interprets science for non-scientists. She holds an academic appointment at Harvard Medical School and Massachusetts General Hospital through teaching. Andrea has worked around the world with a variety of organizations to improve their communication and writing skills through hands-on workshops, seminars and presentations. Andrea writes a monthly column about cutting edge research for the public, and organizes Physiology PhUn Day at the Children's Museum of Boston.

## Launching History Communication: Lessons from a Multidisciplinary Approach

**Eric Olson**  
**Jason Steinhauer**

### Description:

History today is communicated through a wide array of formats and across a growing variety of media platforms. Audiences include policy makers, federal, state and local officials, educators, students, journalists, funders, pundits, commentators, social media followers, enthusiasts and those with only casual interest. The outcomes and risks associated with these communications have broad consequences for society as well as historians and other history practitioners. In this workshop, scholars involved in the founding of the history communication discipline will demonstrate the importance of this new field, how it compares to similar fields and practices, and reveal some of the new tools and resources utilized in the history communication classroom. The workshop will reveal integrated education and technique at a unique and essential scope; the development of new ways of teaching, learning, and communicating about vital topics.

### Author biographies:

Eric Olson is the Director of the Science Communication Network Initiative and a project director for the Open Scholarship Initiative, a United Nations-sponsored series of conferences on scholarly communication. Eric supports research organizations as they develop their projects by providing consultation on engaging with their community of audiences and collaborators. Eric continues to research and work on various scholarly communication projects and events, including the development of history communication curricula, conferences on the benefits of science and humanities convergence, and new science and health communication platforms.

Jason Steinhauer serves as the inaugural director of the Lepage Center for History in the Public Interest at Villanova University. A noted public historian, he is a recognized emerging leader of America's cultural and historical institutions. He previously worked at The John W. Kluge Center of the Library of Congress, the Library of Congress Veterans History Project, as a museum curator and as an archivist. He coined the term "History Communicators" and established the field of history communication.

## Storytelling for STEM with ConnectAnd Improv

**Ellen Feldman Ornato**

### Description:

The best presentations weave compelling stories and data together to take listeners on a journey of understanding. Session participants will learn an improvisation-based storytelling structure and will also play their way to improved presence and delivery from the podium.

### Author biography:

ConnectAnd Improv LLC offers workshops and custom-designed sessions that focus on dramatically increasing listening and connection skills, the mastery of which works to reduce conflict, increase retention, and improve engagement. Their most popular programs focus on empowering the confidence, clarity, ease, and power of speakers and emerging leaders.

**(cancelled)**

**Mary Tyszkiewicz**

### Description:

Are you ready to respond in the first five minutes of unexpected crises? In this 90 minute session, experience the small group abilities you need to be ready using Heroic Improv exercises, based on theater improv. You will learn how the 5-step Heroic Improv Cycle

describes how ordinary people unite in groups of 16 or fewer to help each other in accidents, disasters and terrorist emergencies. And how Heroic Improv exercises can help you be confident to help as a small group in high-stakes situations.

Author biography:

Mary Tyszkiewicz, Ph.D. has been documenting the use of improv for social good since 2011. She is a small-group innovation expert and impact evaluator. Her program for developing small-group innovation abilities is called Heroic Improv. Her upcoming book is called "Playing for Real: How Heroic Improv Saves Lives." The book describes how people naturally use small-group innovation abilities in accidents, disasters and emergencies and how anyone can use Heroic Improv exercises to prepare for these crises. She has researched how innovation emerges in high-stakes situations with Filipino disaster survivors, Central American child migrants and American disaster volunteers.

## **Building Community Science: Unscripted Science Explorations**

**Raquell Holmes**  
**Nicholas Gross**  
**Sofya Borinskaya**  
**Jennifer Novotney**

Description:

The All Stars Project, Inc., a national non-profit, works to transform the lives of youth and poor communities using the developmental power of performance. UX, the "U" stands for university and the "X" for the unknown, is one of its programs produced in New York City by the volunteerism of its students and teachers- an extraordinary community. The focus is on continuing development. People take or teach classes because they are curious and want to try new things with new people. The classes include students of all ages and educational backgrounds drawn mostly from poor communities. The course leads do not act as authority figures or experts. They are co-creators who use their expertise to guide explorations. In this talk, we highlight the student questions, responses to sciences classes and the novel experience of instructors as they improvise developmental, scientific explorations at UX.

Author biographies:

Raquell Holmes, Ph.D the founder of improvscience, is a pioneer in the use of improvisation and performance to advance scientific communities. Formally trained as a cell biologist, she uses her training in human development from the East Side Institute to help scientists build collaborative learning and research environments.

Nicholas Gross, Ph.D.

Nick Gross earned his Ph.D. in physics from BU and is recognized as an expert in the development and delivery of interactive and engaging STEM education programs for a wide range of audiences. Colleagues have also recognized his leadership skills and ability to facilitate conversations that foster peer collaboration in the classroom and among professionals.

Sofya Borinskaya and Jennifer Novotney contributed to development and teaching courses at UX.

## **Effectiveness of Online Learning Communities to Change Student Attitudes toward IT**

**Anu Gokhale**

Description:

The presentation discusses the outcomes of a study conducted by the author to determine the effectiveness of online learning communities to generate interest and more positive attitudes toward information technology among non-STEM majors taking a technology related general education course. Technology is relevant to all students, regardless of their major, as it gives them an opportunity to apply the knowledge gained from varied subjects like arts, business and education to an applied situation that involves computing. It was found that guided learning communities (a form of active learning) fits well with today's Net generation students and is an effective methodology for promoting positive attitudes toward information technology.

## Author biography:

Dr. Anu A. Gokhale is currently a professor and coordinator of the computer systems technology program at Illinois State University. She is named Fulbright Distinguished Chair in STEM for Brazil, 2016-17; was a Faculty Fellow in Israel and Fulbright Specialist in cybersecurity at Gujarat Technological University, India in summer 2017; and a Visiting Professor at Shandong University in Jinan, China during spring 2017. Dr. Gokhale was honored with the 2011 University Outstanding Researcher Award. Originally from India, she has a master's in physics–electronics from the College of William & Mary, and a doctorate from Iowa State University.

## **Serious Play For Cross-Disciplinary Science Communication - Bringing Scientists Together Using the LEGO® Serious Play® Method**

**Camilla Jensen**

## Description:

When working on complex problems that require expertise from multiple disciplines, scientists often encounter barriers to cross-disciplinary communication, as different disciplines have their field-specific vocabulary, jargon, culture, and views on what constitutes valid knowledge and worthwhile problem solving approaches. LEGO® Serious Play® (LSP) is a method that is useful for overcoming such communicative obstacles. In LSP workshops participants build metaphor-rich LEGO models in response to prompts, which enables them to better articulate their ideas and concerns in a constructive way. One participant said that LSP is like “thinking with your hands and listening with your eyes.” During this talk the audience will gain a basic familiarity with the LEGO® Serious Play® method, so that they may be able to discern how the method could be useful for the cross-disciplinary science communication challenges they face.

## Author biography:

Camilla Jensen earned her PhD in the Environmental Planning and Design program at Arizona State University. Her passion is to use design-thinking methods to develop and deliver workshops that enable people from various disciplines to communicate and collaborate more successfully when resolving complex problems. For her dissertation she utilized LEGO® Serious Play® to facilitate cross-disciplinary deliberation and out-of-the-box thinking in the context of nanotechnology and its broader implications to society, health, and the environment. In 2013 she landed a NSF NUE (Nanotechnology Undergraduate Engineering Education) grant to fund that research in collaboration with Dr Thomas Seager.

## **Color and Children: A Critique of Art-Exclusionary Schooling**

**Maria Battor**

## Description:

Within public school, students learn to interact in hegemonically normative ways with themselves and their environments. Normative, top-down schooling involves alienation from a personal artistic sense and emphasis on school structures to the preclusion of creative curiosity. I posit that this set of formative circumstances produces and reproduces adults who are distant from their own voices and potential for innovation. My research is informed by more than a decade of working with children and my data is taken from two years of educational training in a state-approved teacher certification program. I use anthropological and ethnographic methods to qualitatively explore educational environments at a variety of elementary school sites.

## Author biography:

Maria Battor is a graduate student in the Education Policy, Organization, and Leadership department at the University of Illinois Urbana-Champaign. She has been working professionally with children for over a decade. Currently she studies under Anne Haas Dyson, bringing an anthropological ethic into educational spaces and exploring classroom dynamics from a child's point of view.

# Interactive Sessions

## What is a better version of you, than you?

**Mia Anderson**

**Description:**

In this fun and interactive 45minute workshop we will explore what is the importance of feelings and how emotions can support communication. Along with a series of questions, performance techniques, directed feedback and a volunteer “performer” from the audience we as a group can support each other in dealing with the obstacles of communicating with each other. This workshop will give you the foundation blocks to recognize your own style or begin the journey of how to be more effective communicating to others.

**Author biography:**

Mia Y. Anderson is an actress, director and writer. A native of New York, she was born and raised in the Republic of Brooklyn. In New York, she has been featured in several award-winning films like "Sleep" and "Production". She was a 2014 directing fellow at the New Perspectives Theater and an alum of the 2015 Lincoln Center’s Director’s Lab. As a writer, she has published essays in the Lambda Literary award nominee Pinned Down by Pronouns and Bi Any Other Name. She was a member of the Barns Art Collective 2016 Hamilton writing residency and first one woman show "her, him, prince, michael and marvin" will be seen at the Fail-Safe festival this august Check her out [www.miayandersonchannel.com](http://www.miayandersonchannel.com)

## Sharing Your Story

**Neil Bardhan**

**Description:**

We all tell, and listen to, stories. Storytelling bonds humans. Join this experiential presentation on how to build a story using your own life and work. Come discuss what makes up a story, and why you want to share your story. Furthermore, learn how to play with different structures and include certain elements depending on your needs for teaching or otherwise connecting with people. You'll develop a story that you could share on stage or in another format. Best of all, you'll hear other stories and get inspired!

**Author biography:**

Neil Bardhan lives in Philadelphia. He studied cognitive science at The Johns Hopkins University and earned a Ph.D. in Brain and Cognitive Sciences at the University of Rochester. His academic career included researching psycholinguistics in The Netherlands and teaching in Germany. He now works in science communication consulting. He offers coaching and works as part of the improvscience team to transform scientists' practices. Neil enjoys building community, both in person and using social media. He is a company member at PHIT Comedy and performs with the shortform improv group The N Crowd. Neil has been involved with numerous storytelling projects.

## Stage Chemistry: The Science and Math in Technical Theater

**Anna Gelman**

**Willa J. Taylor**

**Brigitte Wittmer**

**Brandi Lee**

**Elizabeth Rice**

**Adrian Azevedo**



**Description:**

This interactive session will engage with Goodman Theatre's STEM program based in technical theater, Stage Chemistry. Through conversation with teachers who have worked with the program and participation in one of the program's interactive workshops, participants will be exposed to a range of STEM, and why theater is the perfect way to teach them.

**Author biographies:**

Willa Taylor is the Goodman's Walter Director of Education and Engagement. She began her career in arts education at Arena Stage where, under founding director Zelda Fichandler, she established the Allen Lee Hughes Fellows Program—one of the first theater-run apprenticeships designed to increase participation by people of color in professional theater. She then went to Lincoln Center Theater where she created The Urban Ensemble, a multidisciplinary project that served at-risk youth. This collaboration between Lincoln Center and New York University's Tisch School of the Arts and The Public Theater was cited by President Clinton's Council on the Arts and Humanities in its 1996 report, *Coming Up Taller*. At Lincoln Center, she consulted for New Victory Theatre, where she designed the arts education program for their inaugural season. Ms. Taylor also served as cultural director for Gay Games IV, where she oversaw the production of more than 200 cultural events, including the Broadway production of Sir Ian McKellen's *A Knight Out*. In addition to a longtime career in the arts, Ms. Taylor brings to the Goodman a wealth of experience in other areas. For 12 years she served as a Russian and Arabic linguist in the US Navy. While overseas, she oversaw productions for the United Service Organization in Greece and managed Armed Forces Radio and Television in Turkey where she created the Profiles in Black history series. Following her graduation from Kendall College's culinary program in 2001, Taylor opened Taylor Made Cuisine, a gourmet catering company as well as Home Café, a neighborhood bistro. In 2005, she helped open and served as the catering chef for Chicago's EatZi's Easygoing Gourmet, a chain of gourmet bakeries, take-out markets and restaurants based out of Dallas, Texas. Elizabeth Rice is the School Programs Coordinator at Goodman Theatre. As a firm believer in theater as art and art as visual story, she is a company member 2nd Story, and has worked with Lifeline Theatre, City Lit Theater Company, Remy Bumpo Theatre Company, (re)discover theatre, The Whiskey Rebellion, and is a board member of Mercy Street Theatre Company. In her free time, she likes to feed people, cook, and eat. Always in that order.

Brandi Lee is a recent graduate from Columbia College Chicago with a concentration in theatre. She has worked with the Goodman Theatre in multiple settings (student, intern, teaching artist) for eight years and is now working as their Education and Community Engagement Associate and Intern Coordinator. Brandi has done work with Storycatchers Theater, FYI (For Youth Inquiry, a performance cadre), and Lifeline Theater.

Anna Gelman is the Curriculum and Instruction Associate at Goodman Theatre. As a Teaching Artist and Director, she has worked with Northern Illinois University's Summer in the Arts Program, Redmoon, The Runaways Lab Theatre, Rhino Fest, Director's Lab Chicago, The Greenhouse Theater Center, and Organic Theater Company, where she is a company member and Media Director. She holds certificates from The Moscow Art Theatre School and The Prague Film School, and is a graduate of Oberlin College.

Adrian Abel Azevedo is the Education and Engagement Assistant at Goodman Theatre leading the newest Goodman Education program, Disney Musicals in Schools. He is a graduate from Columbia College Chicago with a concentration in directing and double minor in Arts Management and Latin American Studies. Around the city, he is a freelance director previously working with Chicago theatres such as Steppenwolf, Porchlight Music Theatre Steep Theatre, Teatro Vista.

## **Fusion Science Theater presents: How to Create a Show that fuses Science, Story, Performance, Dramatics, and Demonstrations to Promote and Assess Conceptual Learning**

### **Holly Walter Kerby**

**Description:**

Science performances can be moving, spectacular, quirky, and inspiring, but they rarely result in conceptual learning. We are Fusion Science Theater, a cross-disciplinary group funded by the National Science Foundation. We believe that learning empowers the individual and the community, and, using elements of flash mobs, stage plays, and demonstrations, we created a novel performance form that supports, guides, and rewards learning. In this interactive presentation, we'll work with the audience to construct our form, and then build a show on conductivity in solutions called, "Will It Light?" Don't know much about conductivity in solutions? No problem. You'll learn as we build and then perform the show with your vocal, cognitive, and kinesthetic participation. We'll find out if our show was a success by using an embedded assessment tool we call, "Vote Your Prediction!" We welcome everyone and promise to give you something to think and talk about.

**Author biography:**

Holly Walter Kerby is the founder and Executive Director of Fusion Science Theater, a group that works with scientists, artists,

educators, museum specialists, and staff and children at community centers to create shows that teach science concepts using methods derived from story. Kerby is faculty emeritus from Madison College where she taught chemistry, physics, and playwriting. Her plays and teaching won national awards, and Fusion Science Theater was awarded two grants from the National Science Foundation. She is currently writing a book, writing on a climate change play, and working with the Alan Alda Center for Communicating Science.

## **Improvisational games for collaboration: Risk, fail, celebrate, and continue!**

**Carolyn Kroehler**

### Description:

In this participatory workshop, we will play games rooted in theatre and improvisation to learn to work together as a group, to notice and use body language and eye contact cues for communication and collaboration, and to keep the action going as a group or in a partnership. We will celebrate failure and move on from it, continuing to play, practice, and learn. Come have some fun! Participants will be provided with handouts detailing game set-up, rules, and variations so that they can take the games to their own students, lab groups, or workshops.

### Author biography:

Carolyn (Carrie) Kroehler, Associate Director of the Center for Communicating Science at Virginia Tech, believes in the power of play. She is a biologist and writer who is committed to helping researchers communicate their work to people outside their specialties. Carrie has been teaching a graduate course in communicating science for the past several years and is amazed and delighted every semester at the transformation and growth of the students who take the class. She has participated in the Summer Institute program at the Alan Alda Center for Communicating Science at Stony Brook University.

## **The Art of Scientific Storytelling: Transform Your Science through Narrative Craft**

**Rafael Luna**

### Description:

After the first session, participants prepare a title and an outline of an abstract of their current work or research. The title (115 character limit including spaces) and outline of the abstract should incorporate aspects of the Scientific Storytelling method discussed in the first session, i.e. hypothesis driven research fashioned into the Storytelling Energy of Activation outline. A subset of the titles and outlines of abstracts will be discussed in class.

### Author biography:

Dr. Luna is a biomedical scientist and the author of the book, "The Art of Scientific Storytelling." He is a dynamic speaker and has taught his Scientific Storytelling method throughout the United States and Europe, e.g. Harvard Medical School, Harvard University, Massachusetts Institute of Technology, MIT-Koch Institute for Integrative Cancer, Wyss Institute at Harvard, Cervantes Institute-History Department at Harvard University, Children's Hospital-Boston, Brigham & Women's Hospital, Boston University Medical School, Dana-Farber Cancer Institute, University of Bergen (Norway), Saarland University (Germany), University of Graz (Austria), London School of Economics (England) and many more.

## **Foundations I - A performatory approach to teaching, learning and technology**

**Jim Martinez**

### Description:

In this interactive workshop attendees will experience a sampling of the first session of Foundations I, a graduate education course that I teach in a Masters of Instructional Technology program at New York Institute of Technology. The course is typically taken by in-service K-12 teachers representing all academic disciplines. I will start the workshop with an improvisational warm-up and provide attendees with an opportunity to create a technology-rich performatory environment that is part of the process of learning to incorporate more technology into teaching practice. The workshop will include a brief whole group discussion, small group work, and group presentations using technology. This workshop is appropriate for anyone who is interested in incorporating technology and performance into teaching at any level. Available technology will be used in the session, but it is not required for participation.

**Author biography:**

Jim Martinez, Ph.D. is an assistant professor of instructional technology, who teaches graduate-level courses in the instructional technology program at NYIT. He makes extensive use of technology in his teaching, and he also uses improvisational performance and play in his collaborations with teachers to create technology-rich learning environments. His research interests include K-8 STEM education, service-learning pedagogies, community research interventions, and Vygotskian approaches to human development and learning. He is the author of a Performatory Approach to Teaching, Learning and Technology, and The Search for Method in STEAM Education, from Palgrave MacMillan.

## **Organizing and Amplifying Integrated Education Resources: A Community Initiative**

### **Eric Olson**

**Description:**

While institutions of learning and even state policymakers have promoted and encouraged integrated education, the blending of topics and methods from the pedagogies of STEM and the humanities, researchers still seek to understand the function and benefits of the practice. Practitioners report improved outcomes from participants, from grade school all of the way to medical school. However, the evidence base for this success is distributed throughout the literature and the web, making it difficult to demonstrate this value to a range of stakeholders.

This workshop will utilize the unique makeup of the CESTEMER contributors and participants to introduce digital tools and team practices that can organize and amplify this evidence, as well as mobilize the community of practitioners around it. In this one session, participants will work in teams begin to build this important tool and connect with other enthusiastic educators that recognize the value of integrated education.

**Author biography:**

Eric Olson is the Director of the Science Communication Network Initiative and a project director for the Open Scholarship Initiative, a United Nations-sponsored series of conferences on scholarly communication. Eric supports research organizations as they develop their projects by providing consultation on engaging with their community of audiences and collaborators. Eric continues to research and work on various scholarly communication projects and events, including the development of history communication curricula, conferences on the benefits of science and humanities convergence, and new science and health communication platforms.

## **Unpacking Unconscious Bias**

### **Ellen Feldman Ornato**

### **Jenny Drescher**

**Description:**

Our brains are wired for bias; it is neither good nor bad. Bias is. The challenge is that “Unconscious Bias” runs in the background of our subconscious minds, impacting every interaction that we have every day. During this session we will explore bias & unconscious bias through the prism of our own lives, communities, and organizations with an eye towards increasing inclusion for all.

**Author biographies:**

ConnectAnd Improv partners Ellen Feldman Ornato and Jenny Drescher offer custom-designed sessions that dramatically increase listening and connection skills, the mastery of which works to reduce conflict, increase retention, and improve engagement. Their most popular programs focus on empowering the confidence, clarity, ease, and power of emerging leaders. ConnectAnd’s principals have expertise in facilitation and coaching in government, corporate, non-profit, and university settings. Their content specialties include personality type (MBTI and DiSC), unconscious bias, conflict management, personal development, medical improv, public speaking & presentation skills.

## **Shine**

### **Beth Osnes**

**Description:**

Shine is a performance for youth-led community engagement for resilience planning. It weaves climate science and artistic expression into a funny and powerful story that spans 300 million years of geological time to convey how energy, humanity, and climate are interrelated. Rehearsing each part immerses youth in the lexicon surrounding climate and energy and leads participants in embodying different aspects of climate science and human development that led us to this point-- where our use of fossil fuels is impacting our climate. The first half of the show is professionally scripted, composed, and choreographed to convey this story that has already been told by history; the second half—our future story-- is authored by local youth to generate solutions for their city's resilience challenges. Local youth are facilitated in performing the show in each location. This entire performance experience is designed to support and celebrate youth engagement in resilience planning.

**Author biography:**

Beth Osnes PhD, is an Associate Professor of Theatre and Environmental Studies at the University of Colorado. She is co-director of Inside the Greenhouse, an initiative for creative communication on climate ([www.insidethegreenhouse.net](http://www.insidethegreenhouse.net)). She recently toured an original musical Shine to cities in the 100 Resilient Cities Initiative to engage youth voices in resilience planning. She has developed a method towards vocal empowerment for young women that she is researching in Guatemala, Tanzania and the USA. Her most recent book is Theatre for Women's Participation in Sustainable Development. She is featured in the award-winning documentary Mother: Caring for 7 Billion ([www.motherthefilm.com](http://www.motherthefilm.com)).

**Choreographing Code: Integrating Dance & Technology****Emma Shockley****Description:**

Come join STEM From Dance (SFD) for the chance to experience a unique program in which you will learn how to fuse dance and technology to create a one-of-a-kind performance. During your time with SFD, you will learn a dance routine, how technology can be used to enhance the routine, and create your own short, tech-infused dance.

**Author biography:**

Emma Shockley is the STEM instructor and administrative coordinator of SFD. Growing up, she studied ballet extensively, but decided to pursue a B.S. in physics in college. In her time at school, she was shocked by how few women were working towards a STEM degree. This, combined with her enthusiasm for interdisciplinary work fusing physics and dance, led her to SFD, where she has been working since she graduated.



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