

The 2<sup>nd</sup> Annual Sustainable  
Energy  
and Design  
Conference  
PROGRAM

October 16-17, 2014 | 8:30 a.m.-5:00 p.m.

[Bronx Community College](#) | Gould Memorial Library [GM]  
2155 University Avenue, Bronx, New York 10453



# Center for Sustainable Energy

Director: Aaron M. Socha, Ph.D.

Associate Director: Joseph C. Bush, Ph.D.

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THURSDAY, OCTOBER 16, 2014

- 8:45 a.m. **Opening Remarks**
- 9:00 a.m. **Panel 1 Host: Diana Hernandez, Ph.D.**  
Columbia University  
Mailman School of Public Health
- 9:05-9:25 a.m. **Stephen Crolius, Ph.D.**  
Alliance Consulting Group
- 9:35-9:55 a.m. **Mahsa Mehrdad**  
City College of New York
- 10:05-10:25 a.m. **Chris Neidl**  
SolarOne
- 10:35-10:55 a.m. **Caleb McClennen**  
Wildlife Conservation Society  
Columbia University Earth Institute
- 11:00 a.m. **Q&A**
- 11:20 a.m. **Networking Break/  
Gould Memorial Library Tour**
- 12:00 p.m. **Lunch**
- 1:20 p.m. **Aaron Socha, Ph.D.**  
Director, Center for Sustainable Energy
- 1:25 p.m. **Keynote: Jonathan Trent, Ph.D.**  
OMEGA
- 2:10 p.m. **Q&A**
- 2:25 p.m. **Coffee**
- 2:35 p.m. **Panel 2 Host: Cory Collman**  
Gluck+
- 2:40-3:00 p.m. **Jeffrey Schwane**  
ARUP
- 3:10-3:30 p.m. **Siyuan Lu**  
IBM
- 3:40-4:00 p.m. **Mitch Joachim, Ph.D.**  
Terreform One
- 4:10-4:30 p.m. **Jeremiah Miller**  
Smarter Grid Solutions
- 4:40 p.m. **Q&A**

FRIDAY, OCTOBER 17, 2014

- 8:45 a.m. **Opening Remarks**
- 9:00 a.m. **Panel 3 Host: John Blaho, Ph.D.**  
City University of New York
- 9:05-9:25 a.m. **James Dickerson, Ph.D.**  
Brookhaven National Laboratory
- 9:35-9:55 a.m. **Sharon Lall-Ramnarine, Ph.D.**  
Queensborough Community College
- 10:05-10:25 a.m. **David Rowley, Ph.D.**  
University of Rhode Island
- 10:35-10:55 a.m. **Richard Gross, Ph.D.**  
Rensselaer-Polytechnic Institute
- 11:00 a.m. **Q&A**
- 11:20 a.m. **Networking Break /  
Gould Memorial Library Tour**
- 12:00 p.m. **Lunch**
- 1:20 p.m. **Joseph Bush, Ph.D.**  
Associate Director, Center for Sustainable Energy
- 1:25 p.m. **Keynote: Adam Siegel**  
Entrepreneur and Management Consultant
- 2:10 p.m. **Q&A**
- 2:25 p.m. **Coffee**
- 2:35 p.m. **Panel 4 Host:  
Wullianallur "R.P." Raghupathi, Ph.D.,**  
Fordham University School of Law
- 2:40-3:00 p.m. **Julian Hadley, Ph.D.**  
Ecovative Design
- 3:10-3:30 p.m. **Jacques-Philippe Piverger, Ph.D.**  
MPowerd, Inc.
- 3:40-4:00 p.m. **Donnel Baird**  
BlocPower
- 4:10-4:30 p.m. **Emily Wheeler**  
NYC ACRE
- 4:40 **Q&A**

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THURSDAY, OCTOBER 16, 2014

## Coffee and Pastries in Gould Memorial Library [GM], Rotunda

### Opening Remarks



**Eduardo J. Martí, Ph.D.**

Interim President | Bronx Community College



**Aaron Socha, Ph.D.**

Director | Center for Sustainable Energy

## Panel 1: Sustainability Without Borders



**Panel 1 Host: Diana Hernández, Ph.D.**

Assistant Professor of Sociomedical Sciences  
Mailman School of Public Health | Columbia University

A sociologist by training, Dr. Hernández' scholarly interests focus on social inequality, structural causes of disadvantage and health disparities. Her research examines the social determinants of health, the built environment (housing and neighborhoods) and the impact of non-medical interventions on health and socioeconomic well-being.

Dr. Hernández' current research is dedicated to the exploration of Energy Insecurity (EI), a conceptual framework she has pioneered that is defined by three primary elements- structural conditions of housing, household energy expenditures and energy-related coping strategies. She is now leading two EI-inspired mixed-method, community-based participatory research projects: (1) an examination of energy efficiency interventions on the health and financial well-being of low-

income families in the Bronx and (2) an assessment of boiler conversions to clean heat sources in 10 buildings in Northern Manhattan. She is also the principal investigator of an NICHD-funded project aimed at improving infrastructure and access to parks to promote health and address violence and obesity in inner-city communities.

Professor Hernández' work has been published in leading journals including the American Journal of Public Health, Energy Policy and the Journal of Poverty and Public Policy. She has designed and taught graduate and undergraduate-level courses in Qualitative Research Methods and Health Disparities. She also actively engages in a variety of translational research activities through consulting, board service and social entrepreneurship in real estate.



## Mr. Stephen Crolius | Alliance Consulting Group

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Mr. Stephen Crolius is a Vice President at Alliance Consulting Group, having returned to the firm in 2012 after six years with the Clinton Climate Initiative (CCI). During his time with CCI, Stephen launched a purchasing consortium which negotiated procurement relationships with 20 energy-related suppliers. He also oversaw the creation of CCI's Buildings, Outdoor Lighting, Waste Management and Transportation Programs. He then served as Director of CCI's Transportation Program, where he was the architect of CCI's Hybrid/Electric Bus Test Program. This program, in partnership with the Inter-American Development Bank, is creating a market for low-emissions buses in Latin America.

Stephen spent 21 years as a business strategy consultant before joining CCI. He started his career at the strategy boutique Telesis. In addition to assignments for corporate clients based in the U.S.,

Mexico, Europe and Japan, Stephen helped launch a practice in Sustainable Development Strategy that drew on the firm's expertise in both business strategy and economic development policy.

Stephen became a Partner in Towers Perrin after that firm acquired Telesis, and went on to senior roles at The Boston Consulting Group and the strategy boutique SJS, Inc. He served as a Vice President at Alliance Consulting Group from 2002 to 2006. His consulting work has been concentrated in the manufacturing, business services and energy sectors, and has included assignments for clients of every size from start-up to Fortune 100. Science and technology have figured in many of Stephen's consulting assignments.

Stephen holds an MBA from the University of Rhode Island and a BS in biology from Stanford University.

### ABSTRACT

#### CCI's Hybrid/Electric Bus Program:

Demonstrating One Road to a Sustainable Energy Economy without Borders. Fostering sustainability in developing countries is a vital undertaking that will progress only to the degree that capital can be mobilized for enabling technologies. The essential challenge is not that capital is lacking but that there is no consensus on what technologies are worthy of investment and how soon they will be ready for funding. The Clinton Climate Initiative (CCI) circumvents this problem by focusing on technologies that 1) have a strong likelihood of being part of the long-term solution and 2) promise a positive return on investment in the current timeframe. CCI's Hybrid/Electric Bus Program is demonstrating how this approach can work and how large its impact can be.



## Mahsa Mehrdad, Ph.D. | Candidate, City College's Grove School of Engineering

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Ms. Mehrdad studied chemical engineering at Amirkabir University of Tehran, Iran. By 2010, she was awarded a Ph.D. fellowship by City College of New York and joined Professor Fillos' research group. As a part of that research group, she was involved in operation and performance optimization of anammox MBBR pilot at the 26th Ward wastewater treatment plant. Her independent activities included the mathematical modeling of the process and the investigation of microbial population diversity.

### ABSTRACT

#### Anammox: Sustainable nitrogen removal from centrate:

The requirement to minimize the impact of domestic effluent on public and environmental health is an important component of wastewater treatment. Removal of nutrients such as nitrogen and phosphorus is a major concern, as the combination of these two can cause uncontrolled algae blooms that choke waterways. As the discharge permit limits the amount of nitrogen for New York City's waste water treatment plants (WWTPs), New York City Environmental Protection (NYCEP) embarked on a comprehensive nitrogen control program by implementing biological nitrogen removal (BNR) technologies in the main flow of its plants and separate sidestream treatment for centrate, an internal high ammonia concentration sidestream generated during the dewatering of the anaerobic-digested sludge.

Typically, ammonia is converted to nitrogen gas in a two-step nitrification/denitrification process. This nitrogen removal method entails significant use of energy for aeration, chemicals to supplement alkalinity and carbon, which accounts for most of the operating costs.

A more promising method is the anammox process which further reduces the energy cost, the alkalinity required, the need for a carbon source, the production of sludge solids and the carbon footprint. In 2011, NYCEP in conjunction with City College of New York (CCNY) assessed the application of the anammox process in centrate treatment using a moving bed biofilm reactor (MBBR) located at the 26th Ward wastewater treatment plant in Brooklyn, NY. Up to 70% nitrogen removal was achieved without alkalinity addition.





## Mr. Chris Neidl | SolarOne

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Chris Neidl is the Director of Community Solar Initiatives for Solar One, a New York City-based clean energy education center. In this position, Chris is exploring and implementing new ways to drive down the cost of solar and improve the solar development experience for both customers and installers through collaborative, group-based approaches.

Since beginning his career as a junior solar installer in Northern California a decade ago, Chris has worked in a number of different capacities and in diverse contexts to facilitate greater solar adoption and investment, including as a consumer educator and policy advocate in New York City and as a project manager, grant officer and business development consultant in India, Afghanistan and East Africa. Most recently, Chris spent three years based in India serving as the regional program manager for Arc Finance, a not-for-profit organization that catalyzes improved

energy access in off-grid markets through microcredit and other financial mechanisms.

Prior to joining Arc Finance in 2010, Chris served as the Advocacy and Outreach Coordinator for Solar One. In this role, he conceived and managed several youth and consumer education programs focused on solar photovoltaic technology and helped organize city and statewide campaigns in support of pro-solar policies. These efforts contributed to a number of key legislative victories that resulted in policies favorable to solar adoption and investment. Chris has also served as an adviser on solar energy-related policy matters for members of the U.S. House of Representatives, the New York State legislature and the New York City Council. His writing and work has been featured in the magazines Solar Today, Good Magazine, the World Bank's C-Gap Microfinance Blog and the popular online magazine Treehugger.

### ABSTRACT

#### How Solar Photovoltaics Can Meet the Electricity Needs of Remote Indian Populations?

India is the world's second most populous nation, largest democracy and one of the most dynamic and diverse societies on the planet. The Indian experience over the past two decades has been defined by rapid though highly uneven economic and social transformation. Lack of access to modern energy - in particular, consistent, reliable and affordable electricity - by millions of Indian households poses significant constraints on India's future development trajectory. The scale and consequences of this crisis have given rise to a wave of technological and business innovation in India's off-grid energy space, and have fueled a new political resolve to make India the world's first 'renewable-powered superpower'. In this short presentation, Chris Neidl, an off-grid energy professional who recently completed three years of field work in India, will provide an overview of India's energy challenges and a sample of the emerging, clean distributed solutions that are emerging to address them."



## Caleb McClennen, Ph.D. | Executive Director, Marine Conservation Wildlife Conservation Society/Adjunct Professor

**Columbia University's School for International and Public Affairs  
and the Earth Institute's Center for Environmental Sustainability**

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Caleb directs WCS' global marine conservation efforts to improve fisheries management, establish effective marine reserves and mitigate the impact of industry to conserve some of the world's most important marine biodiversity in the waters of 24 countries across all five oceans. Currently he is also serving as an adjunct professor at Columbia University's School for International and Public Affairs and the Earth Institute's Center for Environmental Sustainability. Prior to WCS, Caleb spent over

ten years at sea and abroad as an environmental advisor to the Republic of the Marshall Islands and a GIS analyst and marine scientist with Woods Hole Sea Education Association. Caleb holds an undergraduate degree from Middlebury College in Environmental Studies and Geography and a Master's and Ph.D. from the Fletcher School of Law and Diplomacy at Tufts University in International Environmental Policy and Development Economics.

### ABSTRACT

#### Global Conservation Efforts in Coastal Waters:

Improved Ecosystem Resilience and "Downstream Benefits" to Coastal Communities



11:20 a.m.-12:00 p.m.

### **Networking Break/Gould Memorial Library Tour**

Remo Cosentino | BCC campus historian

12:00-1:20 p.m.

### **Lunch**

1:20 p.m.

### **Aaron Socha, Ph.D.**

Director | Center for Sustainable Energy



### **Jonathan D. Trent, Ph.D. | NASA Scientist, Director of OMEGA Global Initiative Adjunct Professor of Biomolecular Engineering, UC Santa Cruz**

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After initiating a project called Global Research into Energy and the Environment at NASA (GREEN), Jonathan developed OMEGA (Offshore Membrane Enclosures for Growing Algae). OMEGA is an integrated energy, food and wastewater recycling system that produces electricity, heat and biofuels, while cleaning wastewater and sequestering CO<sub>2</sub> to support the development of sustainable coastal cities. After leading an OMEGA feasibility study, funded by NASA and the California Energy Commission from 2010 to 2013, Jonathan started the OMEGA Global Initiative to facilitate worldwide development of OMEGA.

Jonathan earned a Ph.D. in Biological Oceanography from Scripps Institution of Oceanography, and had postdoctoral experience at the Max Planck Institute for Biochemistry in Germany, the University of Copenhagen in Denmark and the University of Paris at Orsay in France. He returned to the USA to work at the Boyer Center for Molecular Medicine at Yale Medical School before establishing a biotechnology group at Argonne National Laboratory. He moved to NASA Ames Research Center to work in Astrobiology and Protein Nanotechnology, before establishing the GREEN Team. In addition to working at NASA, he is an Adjunct Professor at UC Santa Cruz and a Fellow of the California Academy of Sciences.

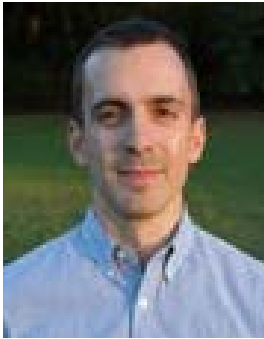
#### **ABSTRACT**

##### **OMEGA: Designs on Sustainability**

Biofuels could be a long term, sustainable alternative to fossil fuels, but only if they are produced in sufficient quantities to meet the demand, with a price at the pump that people will tolerate and without competing with agriculture for water, fertilizer or land. These three issues of scalability, economics and competition with agriculture are why people have lost faith in biofuels. But what if there were a way to produce huge quantities of cheap biofuels that didn't compete with food production or better still provided food without using land, as well as producing other forms of alternative energy and recycled wastewater as drinking water, while improving the environment and creating a sustainable blue-green economy? if all this could be realized in a process that will benefit from sea-level rise, wouldn't it be an altogether different story?



## Panel 2: Urban Design and Infrastructure



**Panel 2 host: Mr. Cory Collman**  
Architect | **Gluck+**

Cory Collman is a designer at GLUCK+, an architect-led design-build firm in New York City. He teaches environmental design for the School of Constructed Environments at Parsons The New School. His work includes physical and conceptual projects that focus on energy efficiency and the implementation of renewables.

His interests and research include life cycle assessment for construction materials, Passive House standards, the history and philosophy of environmentalism, building performance and technology, and responsible architecture. Cory is a licensed architect, USGBC LEED AP, and holds a Bachelor's of Science from University of Illinois-Urbana Champaign and a Master's in Architecture from Yale University.



**Mr. Jeffrey Schwane | Sustainability Consultant, Arup**

Mr. Schwane currently works for Arup as a Sustainability Consultant, where he focuses on green buildings, renewable energy systems and energy efficiency. Jeff has experience in the industry prior to Arup with wind energy systems at GE Energy, solar thermal and solar photovoltaic design and implementation at Bright Power and

district energy modeling experience at Stanford. He has a strong devotion to developing solutions that will enable 100% clean energy in the future. He has a bachelor's degree in Mechanical Engineering from Duke University and a master's degree in Civil & Environmental Engineering from Stanford University.

### **ABSTRACT**

#### **Biological Facade - The SolarLeaf**

The SolarLeaf is a bioreactor façade system designed to produce renewable energy using algal biomass and solar thermal heat. It was developed in Germany through a partnership with Arup, Colt and Strategic Science Consult GmbH. In April 2013, the first ever bioreactor façade was showcased at the BIQ House during the International Building Exhibition (IBA) in Hamburg, featuring 129 SolarLeaf elements covering 200 m<sup>2</sup>. A comparison of the benefits and performance between this innovative technology and other façade energy collecting technologies will be presented.



**Siyuan Lu, Ph.D. | Research Staff Member**

**Department of Physical Sciences, the IBM Thomas J. Watson Research Center**

Dr. Siyuan Lu is currently a Research Staff Member in the Department of Physical Sciences at the IBM Thomas J. Watson Research Center in Yorktown Heights, NY. He received a Ph.D. in physics in 2006 from the University of Southern California. Before joining IBM Research, he was an assistant research professor jointly appointed to the Department of Physics and the Department of Ophthalmology at USC. He conducted highly multi-disciplinary research focused upon the synthesis and characterization of novel hybrid quantum nanostructures, as well as the application of such nanostructures for manipulating neuronal

cell response. Dr. Lu's current research interests at IBM include nanostructured sensors, sensor networks and data-driven modeling of complex systems. In one focus area, he is developing a technology for accurate renewable energy forecasting that combines physics modeling with big data processing and deep machine learning capabilities. Dr. Siyuan Lu has co-authored over 20 peer-reviewed articles and has served as a journal reviewer and member of governmental committees. He is a member of the American Physical Society, the Biophysical Society and the Materials Research Society.

### **ABSTRACT**

**Towards A Multi-scale, Multi-Model, Machine-Learning Solar Forecasting Technology**  
"With increasing penetration of intermittent solar and wind energy in global power grids, the pressing need for accurate forecasting has become well recognized. In this talk, we discuss significant progress towards a scalable solar/wind forecast system using multi-model blending to enhance accuracy. The system leverages upon multiple existing physical models for prediction, including numerous atmospheric and cloud prediction models based on sky camera and satellite imagery as well as numerical weather prediction products. By regressing historical predictions vs. measurements, one obtains an optimal blending of the individual models to create a 'super model' using machine-learning strategies, similar to those used by IBM Watson™ in the Jeopardy! Grand Challenge."



**Professor Mitchell Joachim, Ph.D.** | Associate Professor, NYU  
Co-Founder, Terreform ONE

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Professor Joachim was formerly an architect at Gehry Partners and Pei Cobb Freed. He is a TED Senior Fellow and has been awarded fellowships with Moshe Safdie and Martin Society for Sustainability, MIT. He was chosen by Wired magazine for "The Smart List: 15 People the Next President Should Listen To." Rolling Stone magazine honored Mitchell as one of "The 100 People Who Are Changing America." Mitchell has won many awards including the AIA New York Urban Design Merit Award, the Victor Papanek Social Design Award, the Zumtobel

Award for Sustainability, the History Channel Infiniti Award for City of the Future and Time Magazine Best Invention with MIT Smart Cities Car. Dwell magazine featured him as "The NOW 99" in 2012. He co-authored the books "Super Cells: Building with Biology" and "Global Design: Elsewhere Envisioned." His work has been exhibited at MoMA and the Venice Biennale. He earned a Ph.D. at the Massachusetts Institute of Technology, MAUD Harvard University, and a Master of Architecture at Columbia University.

**ABSTRACT**

**Post-sustainability: New Directions in Ecological Urban Design for the Near Future**

A presentation of noteworthy case studies, projects and outreach efforts that aim to illuminate the environmental possibilities of New York City. These ecological design concepts are intended to inspire solutions in places like NYC and around the world. Mitchell Joachim of Terreform ONE will unpack the working methods of a unique laboratory for scientists, artists, architects and individuals of many backgrounds to explore and advance the larger framework of socio-ecological design.



**Mr. Jeremiah Miller** | Analyst, Smarter Grid Solutions

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Mr. Jeremiah Miller is a professional engineer with 13 years of experience, with proficiency in utility distribution automation, renewable energy, energy efficiency, storage, regulatory frameworks and financial assessments. He is a Senior Smart Grid Analyst with Smarter Grid Solutions, a Glasgow (Scotland) based small company offering end-to-end electric utility smart grid technologies for increasing the hosting capacity of today's grid for tomorrow's solar PV, wind and smart electric vehicles.

**ABSTRACT**

**Modernizing Electric Infrastructure: Moving from passive to active networks**

The swift uptake of solar, wind and other distributed generation technologies, along with new significant loads like electric vehicles being added to the grid, means that our 20th century grid needs to rapidly evolve to support the 21st century's clean energy goals and technologies. The modernization of this infrastructure will necessary move from a passive network to one that is actively managed, in order to coordinate and facilitate the modernization of the grid. Examples will be reviewed that support actively managing the grid for higher visibility, bi-directional power flow, utilizing latent utility assets to increase the grid hosting capacity, and controllability for a safer, more reliable and cleaner electric grid.

**Panel 3: Green Research and Development**



**Opening Remarks**

**Joseph Bush, Ph.D.,**  
Associate Director | Center for Sustainable Energy



**Panel 3 Host: John Blaho, Ph.D.,**  
CUNY Director for Industrial-Academic Research  
within the Office of the Vice Chancellor for Research

John A. Blaho, Ph.D. has over 25 years' experience as a successful and well-funded professor at the University of Chicago and in the Department of Microbiology at the Mount Sinai School of Medicine. He is recognized internationally for his research on human viruses and was appointed to the Doctoral Faculty of the City University of New York in 1995. Dr. Blaho was trained as a chemical engineer and performed NSF-supported research on biomass conversion. His graduate research on nucleic acid biochemistry utilized large scale (500 liter) microbial fermentation of recombinant organisms, a process which served as the nadir of the blossoming biotechnology industry. Prior to joining CUNY, Dr. Blaho served a full time CSO function at a biotech company in Princeton, NJ. In this executive industrial position, he was also responsible for expanding the business through development of key partnerships and creating new investment opportunities. During his tenure in the biotech sector, Dr. Blaho held a Full Member (Professor) position at the Cancer Institute of New Jersey and was a Visiting Scholar in Systems Biology at the Institute for Advanced Study in Princeton. He remains an Adjunct Full Professor of Molecular Biology at the University of Medicine and Dentistry of New Jersey. Dr. Blaho serves as the CUNY Director for Industrial-Academic Research within the Office of the Vice Chancellor for

Research. He has been responsible for creating/maintaining productive sponsored research projects between industrial entities and CUNY research faculty and is currently working to increase the amount of faculty entrepreneurial activities. Dr. Blaho has worked very closely with the university's traditional entrepreneurial center, the CUNY Center for Advanced Technology (CUNY CAT), serving as its Director for University-Industry Collaborations and he continues to function as its Liaison to CUNY for Entrepreneurship. Dr. Blaho assisted in the rebranding the CUNY CAT and increased its industry sponsored research activities. Dr. Blaho was instrumental in the creation of the NSF IUCRC for Metamaterials in 2011, in which CCNY is the lead, and the establishment of the NSF IUCRC for Sustainably Integrated Buildings and Sites in 2012, of which CCNY is a site. Since the fall of 2011, Dr. Blaho has organized over 6 I-Corps Teams that were approved for funding by the NSF. He has served as Industrial Mentor for I-Corps Teams at Stanford in Spring 2012, Michigan in Summer 2012, and in the January 2013 cohort in Arlington, VA. All three of these teams formed companies and have received non-diluted investment funding. In fall 2012, he led the NSF I-Corps submission, and serves as coPI of the NYC Regional Innovation Node (NYCRIN), which was approved for funding in February 2013.



## Dr. James Dickerson

Assistant Director for the User Program and External Affairs  
Brookhaven National Laboratory's Center for Functional Nanomaterials

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James H. Dickerson II completed his undergraduate education at Amherst College in 1994, receiving a BA in physics. He earned his Ph.D. in condensed matter physics from the State University of New York at Stony Brook in 2002, working with Emilio Mendez. He held a postdoctoral research scientist position at the Materials Research Science and Engineering Center of Columbia University from 2002 until 2004, working with Irving Herman. From 2004 through 2011, he was an Assistant Professor of Physics at Vanderbilt University. In 2011, he was promoted to Associate Professor of Physics and Associate Professor of Chemistry. In July 2013, he joined the Department of Physics at Brown University. Presently, he is the Assistant Director for the Center for Functional Nanomaterials at Brookhaven National Laboratory.

He serves on the Editorial Board of Materials Letters and has served as the Chair of the Committee on Minorities of the American Physical Society. His honors include a National Science Foundation CAREER Award, a Ralph E. Powe Junior Faculty Enhancement Award and a W. Burghardt Turner Fellowship.

Dickerson investigates emerging techniques for the assembly and deposition of colloidal nanocrystalline materials into thin films and heterostructures, employing dc and/or ac electric fields to transport and to deposit nanomaterials

onto conducting and semiconducting substrates. His research interests also involve the fundamental correlation among the size and arrangement of atoms and the optical and magnetic properties that are exhibited within nanocrystalline materials, particularly rare earth sesquioxide and rare earth chalcogenide nanocrystals. This involves the fabrication, electron microscopic characterization, and the physical (optical and magnetic) characterization of a variety of nanomaterials, focusing on lanthanide-based nanocrystals and transition metal oxide nanomaterials. Dickerson is the co-editor of *Electrophoretic Deposition of Nanomaterials* (Springer Books), the first comprehensive reference book on the subject.

In his presentation, he will highlight the role that the CFN, through its scientific staff and this scientific user community, is playing in addressing the world's energy challenges. He will focus on several trajectories of research that are being executed at CFN, including work on photovoltaics, novel nanostructured materials for catalysis, soft and biological materials and the state-of-the-art electron microscopy and proximal probe microscopy facilities. Also in this presentation, he will highlight his group's nanoscience research activities in the electrophoretic deposition of colloidal magnetic nanomaterials for various fundamental physics explorations and potential device applications.

### ABSTRACT

#### Nanoscience's Role in Addressing our Nation's Energy Challenges

The Center for Functional Nanomaterials (CFN) at Brookhaven National Laboratory in the United States provides state-of-the-art capabilities for the fabrication and study of nanoscale materials, with an emphasis on atomic-level tailoring to achieve desired properties and functions. The CFN is a science-based user facility, simultaneously developing strong scientific programs while offering broad access to its capabilities and collaboration through an active user program. The overarching scientific theme of the CFN is the development and understanding of nanoscale materials that address the nations' challenges in energy security, consistent with the Department of Energy mission. The CFN is one of five Nanoscale Science Research Centers (NSRCs) funded by the Office of Science of the United States Department of Energy. The CFN supports Brookhaven's goal of leadership in the development of advanced materials and processes for selected energy applications.



## Professor Sharon Lall-Ramnarine, Ph.D.

Department of Chemistry, Queensborough Community College

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Dr. Sharon Lall-Ramnarine is a tenured associate professor in chemistry at Queensborough Community College of the City University of New York. She received her B.S. in chemistry from the University of Guyana in 1995 and her M.A. in chemistry from Queens College of the City University of New York in 1998. In 2003 she received her M. Phil and Ph.D. in analytical chemistry from the Graduate Center of the City University of New York (CUNY). Her thesis was on the synthesis and characterization of new types of ionic liquids under the direction of Dr. Robert R. Engel at Queens College of CUNY. In 2004 Dr. Lall-Ramnarine joined the department of chemistry at Queensborough Community College as an assistant professor. Since 2001, Dr. Lall-Ramnarine has held a research collaborator appointment in the Department of Chemistry at Brookhaven National Laboratory (BNL). She has worked there every summer with students from her research group in collaboration with Dr. James Wishart since the summer of 2005. Dr. Lall-Ramnarine has published her research on ionic liquids in numerous peer reviewed journals and has received several research grants to fund her work. She has also served

as a reviewer for scientific journals, general chemistry textbooks and National Science Foundation grants. Dr. Lall-Ramnarine has co-organized several research conferences. She has been co-chair/committee member of the student member committee of the NY section of the American Chemical Society since 2005, where she co-organizes the Annual Undergraduate Research Symposium. She co-founded the New York Regional Alliance for Ionic Liquids (NYRAILS) and has been the assistant director since 2004. In 2007-2008 she was Director at Large for the NY section of the American Chemical Society. Over the past 10 years, Dr. Lall-Ramnarine has mentored a total of 27 undergraduate students from Queens College and Queensborough Community College. Dr. Lall-Ramnarine and her students have made over 150 presentations at local, regional and national scientific meetings. Her research interests are in designing new types of ionic liquids and studying their properties. In recent years her focus has been on designing ionic liquids with properties optimized for sustainable energy applications.

### ABSTRACT

#### Designing Ionic Liquids for Sustainable Energy Technologies

There is a critical need for improved energy storage devices to improve energy efficiency and for environmentally friendlier approaches to chemical processes. Owing to their uniquely tunable properties, including low volatility, low flammability, inherent conductivity, wide liquid range, wide electrochemical window, high thermal stability and the ability to be recycled, ionic liquids (ILs) can play a crucial role in addressing these needs. They have many important applications in devices and processes for the production, storage, and efficient use of energy and other resources and are being extensively investigated as potential electrolytes in electrochemical devices, including rechargeable lithium cells, solar cells, and supercapacitors. This talk will discuss the preparation and properties of ionic liquids and mixtures of ionic liquids designed for use in the nuclear fuel cycle, for pretreating lignocellulosic material for the production of biofuels and for use in energy storage devices.





**Professor David Rowley, Ph.D.**  
College of Pharmacy, University of Rhode Island

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Expertise: Microorganisms from unexplored environments; secondary metabolites produced by marine microbes; bacterial chemical communication; and antibiotic drug discovery. Pharmacognosy Professor David Rowley, with his students, is turning to the world's oceans for possible new infection-fighting molecules. Pharmacognosy is the study of

the medicinal properties of compounds from such natural sources as the ocean and plants. "Most of our current antibiotic drugs derive from natural products produced by terrestrial microorganisms, so as we try to stay one step ahead of the pathogens, the most logical next place to look is at marine microbes," he said.

**ABSTRACT**

**Aquaculture probiotics**

The marine environment provides an endless bounty of microbes that could lead to the next generation of life-saving antibiotics. Professor Rowley will discuss his recent studies on marine bacteria as probiotic agents for the shellfish industry.

One of the more frightening medical trends today is our growing resistance to antibiotics, which we take for everything from ear infections to life-threatening blood conditions. As people use antibiotics for more and more ailments, the ability of germs and bacteria to mutate and adapt has increased, often making them stronger than the medicines available to treat them. The Centers for Disease Control and Prevention has called preventing antibiotic resistance "mission critical."

Prof. Rowley and his students are turning to the world's oceans for possible new infection-fighting molecules. They are studying bacteria found in mud sediment from a remote region of the South Pacific. Prof. Rowley says preliminary results are promising with microbes that are "perhaps unlike any others that have been investigated."



**Manoj Ganesh, Ph.D. | Chief Scientist, SyntheZyme LLC**

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Dr. Manoj Ganesh received his bachelor degree (2006) in Polymer Technology from Anna University (Chennai, India). Thereafter, he joined Prof. Richard A. Gross's research group to pursue a PhD degree in Materials Chemistry at NYU-POLY (2007-2012). He worked on immobilizing enzymes within polymer matrices to control their activity for degradation of bioresorbable polyesters. In addition he performed research requested by industrial

members who wanted the Center to provide them with a fundamental understanding on how enzyme activity can be enhanced via its immobilization on solid supports. Since 2012 to the present, Dr. Manoj Ganesh has committed himself to working with Professor Gross on entrepreneurial projects which translate technologies developed in the Gross research group for the creation of new small businesses.

**ABSTRACT**

**Chemo-Enzymatic Routes to Biosurfactants and Bioplastics**

Creating valuable biobased building blocks and surfactants for the chemical industry through academic innovations that are translated to a University spin out.



11:20 a.m.-12:00 p.m.

**Networking Break/Gould Memorial Library Tour**

Remo Cosentino | BCC campus historian

12:00 p.m.-1:20 p.m.

**LUNCH**



1:20 p.m.

**Joseph Bush, Ph.D.,**

Associate Director | Center for Sustainable Energy



### Keynote: Mr. Adam Siegel | Entrepreneur and Management Consultant

Entrepreneur operating at the intersection of energy, climate, international security, and business issues. Parachute consultant -- capable of rapid assessment to deliver actionable paths to solve problems and seize newly identified opportunities. Business case analysis for clean-energy start-ups and major defense firms. Managed project teams. Client-focused. Positive impact across a range of issues, from doctrinal development

to operational employment of forces to programmatic changes to decision-making about internal energy efficiency investments. Experience across business, academic, government and military environments. Extensive publications record, including official studies, research monographs, book chapters, academic articles, trade publications and newspaper opinion pieces.

#### ABSTRACT

**Want to convert your technology into a launchpad for a start-up business?**

Based on engagement with multiple early stage firms, Mr. Siegel will provide insights on challenges and opportunities for building a company with early stage governmental and venture funding. He will integrate this with a discussion of energy within the Department of Defense.

## Panel 4: Sustainable Products and Business Models



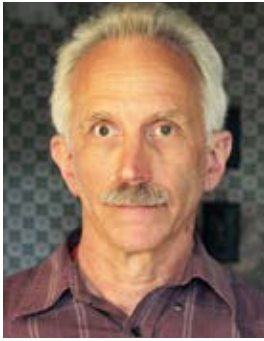
### Panel 4 Host: Wullianallur "R.P." Raghupathi, Ph.D. Fordham University School of Law

RP Raghupathi is Founding Director of Fordham University's Center for Digital Transformation, created in 2011 to explore how technology can improve the way we live by promoting growth, raising the standard of living and bringing people out of poverty. Actively engaged with students at the undergraduate and graduate levels, Professor Raghupathi strongly believes that Fordham can and will enable business and technology solutions that produce tangible progress in New York City and elsewhere.

In addition to his teaching and research, Professor Raghupathi is co-editor for North America of the International Journal of Healthcare Information Systems and Informatics and a senior editorial review board member of the International Journal of Information Technologies and Systems Approach. He has published more than 40 journal articles.

Professor Raghupathi's professional background reflects the intersection of business and technology that defines his Fordham career. He has been a visiting faculty member at Intel Corp., principal at Nexus Systems & Services, researcher at the Automation and Robotics Research Institute, financial and systems analyst at 1st Capital Assets Group and, in his native India, marketing officer at Midwest Leasing Limited and accountant at J.K. Industries.

Before joining the Fordham Schools of Business faculty, Professor Raghupathi taught for nearly a decade at California State University, Chico, where he received professional achievement honors in 1994. He also has received the Outstanding Alumnus Award from the University of Texas at Arlington, where he earned his Ph.D.



## Dr. Julian Hadley | Ecovative Design. Troy, N.Y.

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Dr. Hadley has worked at Ecovative as an ecologist and data analyst since May 2011. His work for the company has included a study of compost produced with its mushroom-derived protective packaging, which he compared to compost produced with more common slow-decomposing organic matter (tree leaves). He also developed a non-toxic method of preventing insect infestations in the plant materials used to produce our packaging materials and he is responsible for statistical analysis of data by the R&D team at Ecovative.

Prior to 2011, he was a research scientist in the fields of tree physiology and forest ecology for over 20 years. From 1988 to 1991, he worked at the Boyce Thompson Institute for Plant Research at Cornell University, studying winter injury to

spruce trees – injury that was ultimately linked to negative effects of air pollution on trees' cold tolerance. From 1993 to 2009, he was a research scientist at the Harvard Forest LTER (Long-Term Ecological Research) Site, operated by Harvard University and funded by the National Science Foundation. He measured whole-forest CO<sub>2</sub> exchange with the atmosphere. His first research used chambers to measure net CO<sub>2</sub> movement between trees or soil and air. He extrapolated from these chamber measurements to estimate total forest-atmosphere CO<sub>2</sub> exchange. Later he also measured CO<sub>2</sub> and water vapor exchange between forest and atmosphere continuously using the "eddy flux" technique, which calculates gas exchange from high-frequency measurements of gas concentrations and micro meteorological conditions above the forest.

### **ABSTRACT:**

#### **Ecovative Design and Earth-Compatible Products**

Non-decomposable wastes of human civilization are accumulating on land and in streams, lakes and oceans, causing the deaths of many animals and removing valuable land from use by either natural systems or humans. Ecovative Design was founded in 2007 to address this problem by developing "earth-compatible" products. These products do not contain or emit toxic vapors or residues, and after use they will decompose into elements or compounds that are reusable by living organisms.

Ecovative's first commercial product is protective packaging, which is now also being produced by Sealed Air Corporation under a licensing agreement. Ecovative is developing Myco Board® (an engineered wood alternative), thermal insulation, acoustical insulation, surfboard cores and more.

All of Ecovative's products are formed from easily available plant fibers that require very little energy to procure. Some of these, such as cornstalks and leaves, are byproducts of agricultural crop production that are currently not used commercially. Ecovative's key discovery is that many types of loose plant fibers can be bonded into solid shapes by mycelium, the nutrient-absorbing tissue of wood decay fungi, a group of organisms never before used in manufacturing. Mycelium can replace petroleum-based plastics and glues in many manufactured products, eliminating potential health hazards of such substances, many of which produce toxic vapors.

Ecovative's replacements for plastic foam are Cradle-to-Cradle Gold Certified and are compostable at home or in industrial composting facilities. In addition, compost with Ecovative packaging as the slow-decomposing 'brown' component is nutritionally comparable to compost with fallen tree leaves as the brown component.



## Mr. Jacques-Philippe Piverger

Chief Executive Officer and Co-founder, MPOWERD Inc.

Dr. Jacques-Philippe Piverger is a social entrepreneur who draws on his business and philanthropic experience to create positive change for humanity across the globe. As Chief Executive Officer and Co-founder, Jacques-Philippe is deeply involved in all aspects of MPOWERD's business and tirelessly works to bring innovative solar lighting solutions to the developed and developing world.

In addition to honing his business acumen as a Director at PineBridge Investments by participating in over \$10 billion of private equity, hedge and real estate transactions globally, Jacques-Philippe also worked at AIG Investments, Friedman Billings Ramsey and Barclays Capital. He founded The Soleil Group, a strategic marketing firm with a diverse portfolio of clients such as Western Union, Universal Music, New York Public Library, Glaceau Vitamin Water, BMG and

Motorola. Jacques-Philippe is also Chairman of Regenerer Haiti, a 2500-acre quadruple bottom line sustainably designed community which takes into account people, planet, profit and society. He founded and is Chairman Emeritus of Soleil Global, a nonprofit organization dedicated to using renewable energy solutions to empower people in developing countries. Jacques-Philippe co-founded and is on the board of The Council of Urban Professionals and he is a Term Member of The Council on Foreign Relations, a Young Global Leader (as designated by The World Economic Forum) and an Advisory Board Member of George Clooney's Hope for Haiti Now Fund. An avid speaker on leadership, impact investing and being a sound global citizen, Jacques-Philippe holds a bachelor's degree from Georgetown University and a M.B.A. from the Tuck School of Business at Dartmouth, where he was a Private Equity Research Fellow.

### ABSTRACT

#### MPOWERD, Inc. - Good Energy

MPOWERD, Inc. focuses on creating cutting edge micro-solar powered technologies that will help alleviate global reliance on fossil fuel based energy sources. "We believe that solar powered lanterns have the potential to serve as a means of upward mobility for the three billion people living in the global south without adequate access to energy. MPOWERD provides disruptive and innovative clean-energy products that will be affordable and durable in order to meet the off-grid needs in both the developed and developing markets."

As a certified Benefit Corporation, MPOWERD has adopted a double bottom line oriented business model, which has yielded significant growth and market penetration compared to its competitors. By selling significant quantities of Luci lights through their mass merchant partners in the developed world, MPOWERD is better positioned to get their micro-solar solutions into the hands of those who need them the most in the developing world. The more Luci Lights purchased in the developed market, the greater the impact in the developing world. High-volume retail sales reduce manufacturing costs, making MPOWERD products more affordable for those living in energy poverty. This presentation will elaborate on the particulars of MPOWERD's goal of eradicating energy poverty through solar justice.



## Mr. Donnel Baird | Chief Executive Officer

BlocPower

Donnel spent three years as a community organizer in Brooklyn and one year as a voter contact director for Obama For America. Donnel managed a national Change to Win campaign to leverage the Department of Energy's energy efficiency stimulus financing to create green construction jobs for out of work populations. He partnered with the Washington Interfaith Network to generate a \$100 million government energy efficiency investment in underserved communities in the District of

Columbia. Donnel's team negotiated similarly successful agreements in Portland, Milwaukee and New York.

Donnel is an Open Society Foundation/ Echoing Green Fellow and a graduate of Columbia Business School, where he was a Board of Overseers Fellow, a member of the Sanford Bernstein Board for Leadership and Ethics and a recipient of investment from the Eugene F. Lang Fund for Entrepreneurial Initiative.

### ABSTRACT

#### High Return Investing in Clean Energy for Underserved Communities

BlocPower works with community leaders and institutions to assemble four or more non-profits, houses of worship, schools, small businesses or multi-family residences in financially underserved communities into a "Bloc" of potential retrofits.



## Ms. Emily Wheeler

Deputy Director | NYC ACRE,

Office of Innovation Development | Polytechnic Institute of New York University

Emily Wheeler is currently the Deputy Director of NYC ACRE and the Operations Manager for PowerBridgeNY. Previously, Emily was a project manager in the Loan Program Office at the Department of Energy, where she conducted encompassing technical and partial financial due diligence of large-scale renewable energy projects. Emily managed the engineering analyses of six commercial-scale, first-of-a-kind technology loans moving toward financial close within nine months. Emily graduated from Rensselaer Polytechnic Institute with a B.S. in chemical engineering.

### ABSTRACT

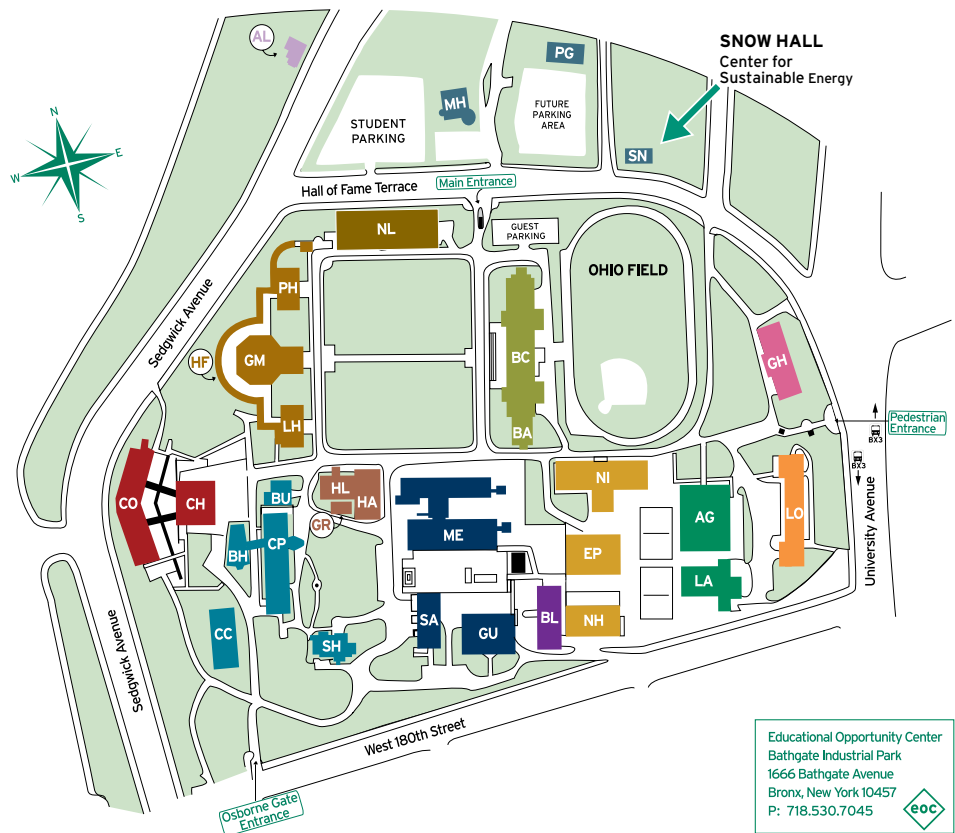
#### Local Business Incubation: Sustainable Growth for New York City and New York State

The New York City Accelerator for a Clean and Resilient Economy (NYC ACRE) helps clean technology and renewable energy companies in New York City grow, advancing the city as a role model for a low-carbon future while also creating jobs. NYC ACRE is dedicated to growing an ecosystem of entrepreneurs, international companies and innovative local businesses that provide solutions to climate and energy issues in NYC.

## BRONX COMMUNITY COLLEGE | Campus Directory

AL	ALTSCHUL HOUSE
AG	ALUMNI GYM
BA	BROWN ANNEX
BH	BEGRISCH HALL
BL	BLISS HALL
BU	BUTLER HALL
CC	CHILDREN'S CENTER
CP	CARL POLOWCZYK HALL
CH	COMMUNITY HALL
CO	COLSTON HALL
EP	ENERGY PLANT
GH	GOULD HALL
GM	GOULD MEMORIAL LIBRARY
GR	GREENHOUSE
GU	GUGGENHEIM HALL
HF	HALL OF FAME FOR GREAT AMERICANS
HA	HAVEMEYER ANNEX
HL	HAVEMEYER LAB
LH	LANGUAGE HALL
LA	LOEW ANNEX
LO	LOEW HALL
MH	MACCRACKEN HALL
ME	MEISTER HALL
NL	NORTH HALL & LIBRARY
NH	NEW HALL
NI	NICHOLS HALL
PG	PATTERSON GARAGE
PH	PHILOSOPHY HALL
BC	ROSCOE BROWN STUDENT CENTER
SA	SAGE HALL
SH	SOUTH HALL
SN	SNOW HALL

♣ Ground floor accessible only



“Nature is not a place to visit.  
It is home”

- Gary Snyder

### **About Bronx Community College**

Bronx Community College of The City University of New York offers more than 30 academic programs that prepare students for careers and to continue their education at four-year colleges. Located on a 44.6-acre tree-lined campus, BCC is home to the Hall of Fame for Great Americans, the country's first hall of fame. The College provides its approximately 11,500 students with quality academic programs, outstanding faculty, and flexible class schedules. BCC is a Hispanic Serving Institution (HSI), with students representing approximately 100 countries. In October 2012, the BCC campus was declared a National Historic Landmark, becoming the country's first community college campus to receive such a designation. For more information about Bronx Community College, visit [www.bcc.cuny.edu](http://www.bcc.cuny.edu).

