American Chemical Society's New York Section, Inc.
William H. Nichols Distinguished Symposium

Honoring Professor Mercouri G. Kanatzidis
"How Halide Perovskites Expanded the Frontiers of Photovoltaic Solar Energy"
Citation: For Transformative Work in Halide-Perovskite Solar Cells

Friday, April 10, 2026
St. John's University, Queens NY

1:00 p.m. **Welcome**
Joseph Wiener, 2026 Chair, ACS New York Section, PepsiCo

1:05 p.m. **Greetings from St. John's University**
Professor Teresa Delgado, Dean of St. John's College of Liberal Arts and Sciences

1:10 p.m. **Opening of the Distinguished Symposium**
Joseph Ulichny, 2026 Chair-elect, ACS New York Section, Columbia University

1:15 p.m. **Electrochemical Approaches for Sustainable Phosphate and Lithium Cycles**
Professor Kyoung-Shin Choi, University of Wisconsin-Madison
Phosphorus is one of the main components of fertilizers and is also essential for various industrial manufacturing processes. While the continued increase in the human population will require greater fertilizer production, global phosphate rock reserves are limited. Furthermore, the mining of phosphate rock, its conversion to phosphoric acid, and the disposal of phosphate-containing waste create multiple environmental concerns. Thus, it is highly desirable to develop cost-effective methods to recycle wasted phosphate into useful chemicals such as H_3PO_4, both to safeguard the supply of phosphorus and to protect the environment. Another element of critical interest is lithium. The growing number of electric vehicles (EVs) powered by lithium-ion batteries (LIBs) will generate a massive number of spent LIBs in the near future. $LiFePO_4$ has recently become the most preferred cathode material for LIBs in EVs because it is significantly cheaper and safer than other cathodes. Recovering lithium from spent $LiFePO_4$ batteries using conventional methods, however, may not be economically viable because, unlike Ni-, Mn-, and Co-based LIB electrodes, $LiFePO_4$ contains no valuable metals other than lithium. In this presentation, we will report new electrochemical approaches that we have been developing to selectively extract phosphate or lithium ions from waste and recover them as high-purity, useful chemicals (e.g., H_3PO_4 for phosphate and Li_3PO_4, Li_2CO_3, and LiOH for lithium). We will present the design and operating principles of electrochemical cells for phosphate and lithium recycling. Finally, we will highlight the sustainable nature of our electrochemical approaches, which minimize the use of chemicals and the generation of waste throughout the process.

1:45 p.m. **Nature's Blueprint: Powering the Planet with Sunlight, Water & Carbon Dioxide**
Professor Aditya Mohite, Rice University
This presentation covers state-of-the-art research in solution-processed perovskite solar cells, where we have demonstrated commercially validated durability through the synergistic combination of 3D and 2D perovskites. We demonstrate state-of-the-art photoelectrochemical reactors for water splitting, which utilize perovskite photovoltaics where we have demonstrated >22% solar-to-hydrogen efficiencies with thousands of hours of on-sun operation. Finally, we make the case for CO2 as an asset and a valuable feedstock for the production of value-added products and materials. Non-thermal or cold plasma processes present the unique capability to perform chemical transformations in a non-equilibrium state, achieving efficiencies beyond those predicted by thermodynamics. One of the most attractive features is the opportunity to linearly scale this technology at flow rates of 100-200 liters per minutes per reactor in-house. These results have inspired the development of the "Plasma Foundry" for scalable decarbonization of industries.

2:15 p.m. **Discovering Compounds and Designing Materials**
Professor Ram Seshadri, University of California - Santa Barbara
In the literature, extended crystalline compounds are sometimes inaccurately labeled materials, but materials are usually compounds that display some useful functionality. Moreover, real materials, when employed in real-world applications, are rarely pure compounds. It is also of historical interest to note that the synthesis of chemical compounds often predates the discovery of the key functionality that would allow the compound to be declared a material, sometimes by decades. It is more often the case therefore, that compounds that have been previously synthesized are screened for their function. I will discuss approaches to the synthesis of new compounds (using examples of halide perovskites and double perovskites), and how computational tools aid in screening these compounds for useful functionality (using magnetocalorics and low-k dielectrics as examples). It turns out to be rarely the case that functional materials are made by design.

2:45 p.m. **Coffee Break**

3:15 p.m. **Application of Ductile Electronics Strategies to Soft Matter Solar Cells**
Professor Tobin Marks, Northwestern University
This lecture focuses on the challenging, understanding-based design, creation, and realization of new materials combinations for high-efficiency, environmentally stable, ductile (flexible and stretchable) polymeric organic solar cells (OSCs) which are also manufacturable at low cost and according to green chemical principles. While OSC power conversion efficiencies (PCEs) have now exceeded 20% and environmental stabilities have increased greatly, major materials design issues for next-generation polymer photovoltaic challenges remain and are the focus of this lecture. And it is clear that fabrication methodologies should include high-throughput, large-area, high-resolution printing techniques. Topics to be discussed are: 1. Targeting high-efficiency donor and acceptor materials classes that, among other properties, can be produced economically using established evaluation metrics of the pharmaceutical industry; 2) Developing synthetic methodologies that are environmentally benign (green) and produce materials with minimum structural/electronic defects and good opto-electronic performance; 3) Developing new non-fullerene acceptors that enhance molecular packing, hence PCE and OSC stability; 4) Creating exceptionally ductile OSCs with good PCEs by incorporating functional elastomers or plasticizing non-fullerene acceptors.

3:45 p.m. **Introduction of the Medalist**
Professor Tobin Marks, Northwestern University

4:00 p.m. **How Halide Perovskites Expanded the Frontiers of Photovoltaic Solar Energy**
Professor Mercouri G. Kanatzidis, Northwestern University

The discovery of halide perovskite materials as exceptional solar-absorbing semiconductors stemmed from the drive to develop more stable, all-solid-state dye-sensitized solar cells. What began as a modest goal led to far more than anticipated, resulting in the emergence of a remarkable new class of photovoltaic devices. Three-dimensional (3D) and two-dimensional (2D) halide perovskites have become standout semiconductors in recent years, known for their excellent carrier lifetimes and structural adaptability. Yet, the roles of Pb^{2+} and Sn^{2+} ions, along with the impact of organic spacer cations on structure and performance, remain areas that demand deeper investigation. Meanwhile, perovskitoids, a related but structurally distinct class of materials, offer expanded design flexibility through even richer structural and compositional diversity. Recent studies have shown that certain organic cations can stabilize these frameworks effectively. This presentation will explore the latest findings on structure–property relationships in halide perovskites and perovskitoids, providing practical insights into the rational design and integration of organic spacers in crystalline semiconductors and optoelectronic devices.

4:45 p.m. **NICHOLS MEDAL AWARD CEREMONY**

Presiding:	**Mr. Joseph Wiener** **2026 Chair, ACS New York Section**
ACS Greetings:	**Dr. Rigoberto Hernandez, ACS President** **Dr. Dorothy Phillips, ACS Immediate Past President** **Mr. Albert Horvath, ACS Chief Executive Officer**
Presentation of the Medal:	**Mr. Joseph Wiener**
Acceptance Address:	**Dr. Mercouri G. Kanatzidis** **Nichols Medalist**

5:30-7:00 p.m. Complimentary Reception for all Attendees and Speakers

For More Information: Please visit the New York Section website at http://newyorkacs.online/nichols_medal/

2026 Nichols Medalist

Professor Mercouri Kanatzidis was born in 1957. He earned his Ph.D. in inorganic chemistry from the University of Iowa in 1984, following a Bachelor's degree in applied chemistry from Aristotle University in Thessaloniki, Greece. He conducted postdoctoral research at the University of Michigan and Northwestern University from 1985 to 1987. From 1987 to 2006, Dr. Kanatzidis held professorships at Michigan State University before joining Northwestern University in 2006 as a professor and senior scientist at Argonne National Laboratory. Renowned for his groundbreaking work in halide perovskite materials, Dr. Kanatzidis pioneered the development of all-solid-state solar cells, significantly advancing photovoltaics. His research on coherent nanostructuring has revolutionized the understanding of energy conversion in materials, particularly in thermoelectric materials that convert heat into electricity. Dr. Kanatzidis has received numerous prestigious awards and honors throughout his career, including the National Academy of Sciences in 2024, the Royal Society of Chemistry Centenary Prize and election to the American Academy of Arts and Sciences in 2023, the Global Energy Prize in 2022, and the Clarivate Highly Cited Researcher designation since 2015 in three disciplines: chemistry, physics, and materials science. Additionally, he was honored with the DOE Ten at Ten Scientific Ideas Award in 2019 for his groundbreaking work on all-solid-state solar cells and received the American Institute of Chemistry Chemical Pioneer Award in 2018. He is the winner of the 2025 Albert Einstein World Award of Science. Dr. Kanatzidis has mentored over 200 postgraduate and postdoctoral students, shaping the future of renewable energy science. In addition to his scientific contributions, he is dedicated to education and service, inspiring young scientists to excel in research.

THE WILLIAM H. NICHOLS MEDAL AWARD

Dr. William H. Nichols, a charter member of the American Chemical Society and its president in 1918 and 1919, was a pioneer in the development of the chemical industry in the United States and an early champion of the importance of chemistry in the future growth of the nation. The success of his companies can be traced to several notable principles that guided Dr. Nichols' career. First was his deep belief in research and development. Second was his support for science education and the students of chemistry. Third was his concern for the welfare of his employees. Overriding all of these was his often-quoted belief that "the Golden Rule is as applicable in business as it is in church." It is this legacy of Dr. William H. Nichols that the New York Section is proud to maintain in its annual award of the Nichols Medal each spring.

It was in 1902, that Dr. Nichols established this annual award, the first in its field, of a gold medal to be presented to a chemical scientist for original research. The William H. Nichols Medal was first awarded in 1903. Since its inception, the New York Section of the American Chemical Society has administered the award. It has been perpetuated through the generosity of Dr. Nichols, his family, and the Nichols Foundation, Inc. The award ceremony has evolved into a Distinguished Symposium and a Medal Award Banquet during which scientists can interact with their colleagues and with chemistry students. The Nichols Medal itself depicts the allegorical figure of Dr. Faust in his laboratory as described by Goethe, and the obverse side bears an inscription of the name of the medalist and the award citation. A listing of all the William H. Nichols Medalists and their medal citations can be found at www.newyorkacs.org/nicholsmedalists.html.

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