



NASA STEM SYMPOSIUM

PRES

POLY: Chemistry for Resilient Human Space Exploration



James and Marilyn Simons



BLAVATNIK FAMILY FOUNDATION



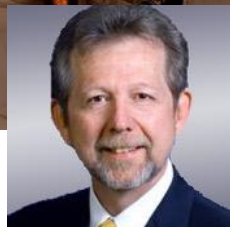
Deloitte

POLY
PMSE

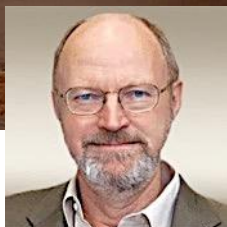
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- CHAL I&EC
- CHAS INOR
- CHED PHYS
- COLL PROF
- ENFL SCHB

8/23 PMSE ACS Outstanding Student & Mentor Awards supported by CME

8/24 Free Reception at Georgia Tech



James Green
NASA



Robert Grubbs
Caltech



Ben Feringa
U. Groningen



4th Event with NASA's Chief Scientist Office



August 23 - 24, 2021 | Atlanta, Georgia

CME Lectures by Nobel Laureates
PMSE CME Student & Mentor Awards
Climate Change Talks by Thought Leaders
Reception at Georgia Tech

Organizations Supporting this ACS Presidential Event (PRES)



Chemical Marketing & Economics, Inc.
3322 Highway 22 West, Suite 421, Branchburg, NJ 08876

POLY: Chemistry for Resilient Human Space Exploration

This Presidential Event (PRES) of the 2021 ACS President Dr. H. N. Cheng sponsored by the Division of Polymer Chemistry (POLY) and co-organized with CME and NASA brings together industry, academia and government to enhance the diverse STEM talent pool. Two days packed with inspirational cutting-edge developments in the chemical sciences to advance human space travel and translate them into new knowledge to improve the lives of people and make their dreams a reality.

August 23, 2021 - DAY 1

NASA Day

AM, PM: Speakers from NASA (HQ, Ames, Glenn, Goddard, Huntsville), Caltech, FSU, Northwestern University, Georgia Tech

PM: NASA Talks, PMSE and CME present the Student & Mentor Awards

August 24, 2021 - DAY 2

Industry & Academia Day

AM: Panels with speakers from industry: J&J, Northrop Grumman, BASF, ISS US National Lab, Carbice, SkyNano, Sila Nanotech, Georgia Tech.

PM: Keynote: James Green NASA Chief Scientist; Speaker from Deloitte, Sustainability/Climate Change Panelists Marilyn Brown and Judith Curry.

CME Lectures by Nobel Laureates: Robert Grubbs and Ben Feringa.

Reception at Georgia Tech | Chemistry and Space Science Lab Tours

Get Schedule Changes, Room/Overflow Room Updates, Speaker Bios

Register for Symposium & Reception: www.CME-STEM.org



August 23: NASA Day and PMSE CME Student & Mentor Awards



8/23 -- Fourth CME NASA Symposium: Chemistry for Resilient Human Space Exploration

Register for Schedule Updates, Speaker Bios, Room Assignments: www.CME-STEM.org

POLY017A - NASA Day One - Morning Session

8:00 AM	Jonathan Rall, Stephanie Vivod		Introduction to the Fourth CME NASA Symposium
8:01 AM	Lindsay Hays	NASA DC, Astrobiology	Ladder of Life Detection
8:30 AM	Mark Nevau	NASA Goddard	Searching for Life on Ocean Worlds
9:00 AM	Jennifer Stern	NASA Goddard	Nitrogen and Habitability on Mars: Insights from Missions, Meteorites, and Terrestrial Analogs
9:30 AM	John Vickers	NASA Huntsville	NASA Composites Technology - A Chronicle -- Intermission at 10:00 AM

POLY017B - NASA Day One - Morning Session

10:30 AM	Richard Liang	FSU, Professor	Fundamental Understanding and Optimization of Long-range orders in CNT Assemblages for High-performance Structural Composite applications
11:00 AM	Julia Kalow	Northwestern U.	Light as a Selection Pressure in Photochemical "Directed Evolution"
11:30 AM	Seth Marder	U. of Colorado	Studies on the Formation, Properties and Applications of Conjugated Covalent Organic Frameworks (COFs)
12:00 PM	David Wirth	UCSD Grad Student	HEMAfoam: A Novel Foaming Resin Expands Applications for Lithographic 3D Printing -- Luncheon Break at 12:30 PM

POLY017C - NASA Talks, PMSE CME Student & Mentor Awards

2:00 PM	John Vickers	NASA Huntsville	Overview of Additive Manufacturing and In-Space Manufacturing at NASA
2:30 PM	Jessica Koehne	NASA Ames	In-Space Manufacturing of Point-of-Care Diagnostic Devices
3:00 PM	Ksenia Takhistova	CME Co-Chair	PMSE CME STUDENT & MENTOR AWARDS
3:01 PM	Austin Evans	Northwestern U.	Two-Dimensional Polymers and Their Applications
3:30 PM	William Dichtel	Northwestern U.	Synthesis Supramolecular Polymerization of Nanotubes Based on Protonation-Induced Assembly of Macrocycles -- Intermission at 4:00 PM

POLY017D - Advanced Materials, PMSE CME Student & Mentor Awards

4:30 PM	Qi Zhang	U. of Groningen	The Road to Intrinsically Dynamic Materials: Disulfide Chemistry as a Solution
5:00 PM	He Tian	East China U	Dynamic Assembling for Smart Materials
5:30 PM	Ben Feringa	U. of Groningen	Molecular Motors for Responsive Materials -- Session Adjourns at 6:00 PM

August 24: Industry Day and CME Lectures by Nobel Laureates



8/24 -- Fourth CME NASA Symposium: Chemistry for Resilient Human Space Exploration

Register for Schedule Updates, Speaker Bios, Room Assignments: www.CME-STEM.org

POLY017E - Advanced Materials - Industry Panel

8:00 AM	Ksenia Takhistova	CME Co-Chair	Introduction with Tara Ruttley, NASA
8:01 AM	Jon Arenberg	Northrop Grumman Chief Engineer	What Can Chemistry Do to Enable the Next Great Leap in Space Science?
8:15 AM	Kenneth Savin	Int'l Space Station	ISS National Lab and In Space Production Applications
8:30 AM	Anne Shim	BASF Adv Materials	Polymers for a Resilient Future
8:45 AM	Craig Green	Carbice CTO	Performance Assessment and Flight Heritage of Carbon Nanotube Based Thermal Interface
9:00 AM	Tara Ruttley	NASA	Industry Panel with J&J Matt Truppo - Intermission at 10 AM

POLY017F - Material Innovations - Industry Panel

10:30 AM	Gleb Yushin	Sila Nano CTO	Advances in Conversion-Type Electrodes for Lightweight Batteries
10:45 AM	Thomas Orlando	Georgia Tech Prof	Roles of Graphene Composites and Metamaterials in Human Space Exploration
11:00 AM	Anna Douglas	SkyNano CEO	Electrochemical Capture and Conversion of CO ₂ into All-Carbon Nanostructures
11:15 AM	Marty DeGroot	DuPont R&D Dir	Materials Innovation for Now and Tomorrow at DuPont
11:30 AM	Stephanie Vivod	NASA Glenn	Polymer Aerogels for Lunar Applications and Beyond
11:45 AM	Tara Ruttley	NASA	Panel Discussion - Luncheon Break at 12:30 PM

POLY017G - Keynote and Sustainability Lectures

2:00 PM	James Green	NASA Chief Scientist	Shaping a New Era of Space Exploration with Perseverance, Ingenuity, and Resiliency
2:25 PM	Robert Kumpf	Deloitte	Enabling Sustainability Through Transformational Change
2:45 PM	Judith Curry	Georgia Tech Prof	Formulating Climate Change Solutions Under Deep Uncertainty
3:00 PM	Marilyn Brown	Georgia Tech Prof	Creating Localized Carbon-Reduction Strategies
3:15 PM	Green, Curry, Brown, Takhistova		Panel: Creating Resilient Approaches to Climate Change
4:00 PM	Intermission		

POLY017H - CME Nobel Laureate Lectures

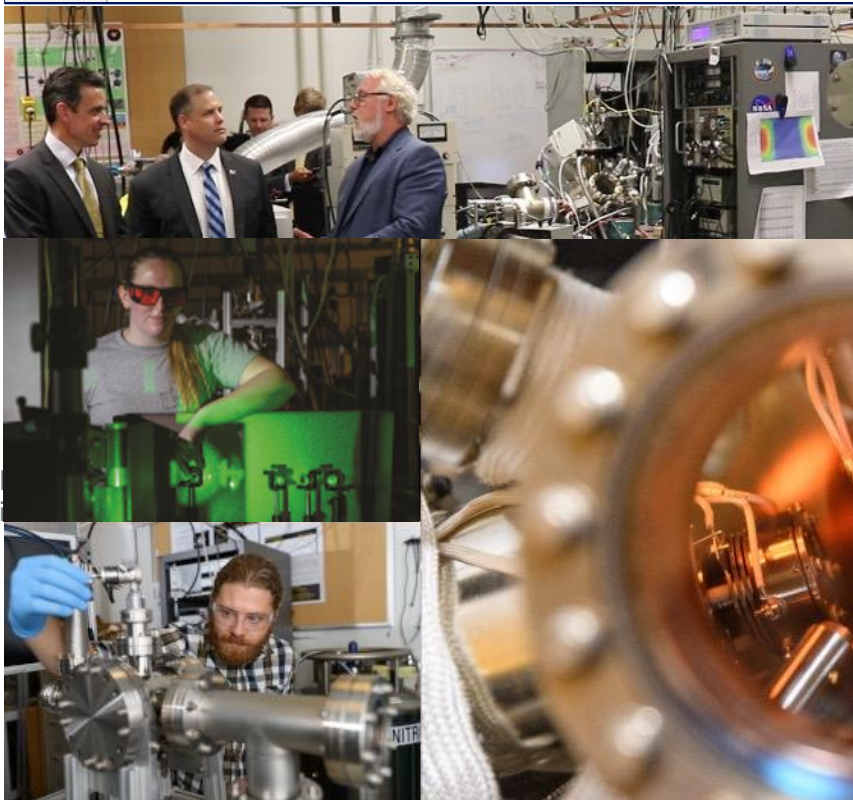
4:30 PM	Robert Grubbs	Caltech	Exploring Advances in Polymer Synthesis and Catalysis in Organic Synthesis
5:00 PM	Ben Feringa	U. of Groningen	Exploring Catalytic Space
5:30 PM	Ksenia Takhistova, Robert Nolan		Symposium Summary, Reception Instructions -- 5:33 PM Adjournment

August 24: Afternoon & Evening In-Person Activities at GT

Free Luncheon, Discussions, Reception & Lab Tours

Register for shuttle and activity schedules, maps and tour information

12:30 PM	GWCC Shuttles to Georgia Tech (afternoon and evening)
1:00 PM	Networking Luncheon with the Symposium Speakers
2:00 PM	Space & Sustainability In-Person Discussions and Posters
5:30 PM	Reception Registration
6:00 PM	Welcome Remarks and CME Awards of Merit Presentation
6:30 PM	Chemistry Lab Tours - Reception Ends at 10 PM



Registration: www.CME-STEM.org



CME Lectures by Nobel Laureates

For the Annals of Civilization



Robert Grubbs
Caltech

2005 Nobel Prize in Chemistry

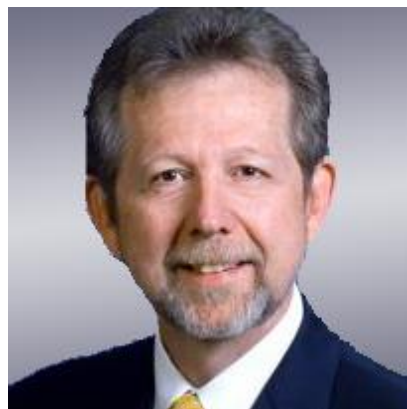


Ben Feringa
University of Groningen

2016 Nobel Prize in Chemistry

Keynote

Symposium Remarks



James Green
NASA

Chief Scientist



H.N. Cheng
American Chemical Society

2021 President



Angela Wilson
American Chemical Society

2022 President

August 23 - 24, 2021

2021 Speakers & Panelists

Partial list of distinguished thought leaders



Jon Arenberg
 Northrop Grumman

Chief Mission Architect, Science and Robotic Missions



Robert Kumpf
 Deloitte

Specialist Executive, Chemicals & Specialty Materials



Anne Shim
 BASF Corporation

Head of Advanced Materials and Systems Research

Climate Solutions and Sustainable Innovation



Marilyn Brown
 Georgia Tech

Interim Chair, School of Public Policy; Prof. Sustainable Systems



Judith Curry
 Georgia Tech

Professor, School of Earth & Atmospheric Sciences



Craig Green
 Carbice

Chief Technology Officer

2021 PMSE CME Student & Mentor Awards

ACS Global Outstanding Student & in Polymer Science & Engineering



Austin Evans
Northwestern University
USA Graduate Student



Qi Zhang
East China University S&T
International Graduate Student

Mentors



William Ditchel
Northwestern University
Mentor



He Tian
East China University S&T
Mentor



Ben Feringa
University of Groningen
Co-Mentor

2021 CME Awards of Merit

Georgia Tech Reception 8/24/2021



Advancing STEM Education

Fiorella Olivera

ACS Peru

Chair

32-year-old Adjunct Professor, UPCH and Continental Univ.

Founder of Peruvian Society of Electrochemistry; and Making Science Home School Director

Member, Chemists without Borders

Finalist ACS ChemLuminary Award for Global Engagement

Science Festival Collaborator with Peruvian government, 30,000-attendee events

Multi-Regional Organizer of Festivales de Quimica



Enabling Quality of Life

Michael Wimmer

Next Era Innovations

Founder & Creative Mind

12-year-old architect of health systems utilizing multiple household internet devices

2021 Graduate of the Rowan-Cabarrus Community College

2021 Valedictorian of the Concord Academy High School

2017 NAO Robotic User and Development Congress winner of the Educational Application Development Award

2019 Awardee of the U.S. Special Operations Command Science and Technology Military Challenge Coin

2017-2019 Speakers

Partial list of distinguished thought leaders



Janet Kavandi
NASA Glenn Research Center
Director (Former Astronaut)



Craig Venter
Human Genome Project
Visionary Industry Scientist



Frances Arnold
Caltech
2018 Nobel Prize in Chemistry

Sustainable Innovation



Rich Tillyer
Johnson & Johnson, Janssen
Global Head of Discovery



Peter Eckes
BASF Bioscience Research
President



Robert Langer
MIT
Koch Institute Professor; most cited engineer, 1400 patents

2021 Event Collaborators

Partial list of distinguished individuals



Michael Meador

Ret. NASA

Former Director of the National Nanotechnology Initiative



Tara Ruttlely

NASA Liaison with CME

Associate Chief Scientist,
Microgravity Research



Thomas Orlando

Georgia Tech

Associate Dean for Energy Research

CME Co-Organizers



Robert Nolan

CME Treasurer

Doctoral Faculty, City University of New York (CUNY)



Ksenia Takhistova

CME Co-Chair

Technology IP Attorney;
Mechanical & Chemical Engineer



George Rodriguez

CME Programming

Chemical Engineer, American Chemical Society Fellow



Award-winning Space Age STEM & ESG Programs



Advancing Diversity and Environmental Social Governance

CME STEM Symposiums with NASA

CME STEM Leadership Awards

CME STEM Talks by Thought Leaders

CME STEM Festivals



NASA: Forward to the Moon with Commercial Partners

2020.12.08 • Webinar 11 am – 12 pm ET



By 2024 NASA's Artemis program will land the first woman and the next man on the south pole of the Moon. NASA will be using innovative technologies to explore more of the lunar surface than ever before. Learn about opportunities in sustainable innovation for commercial partners to exploit the resources and propel a new dynamic in the Space Age as we write a new chapter in the history of civilization.

Speakers

CME Awardee



James Green
NASA

Chief Scientist



Doug Terrier
NASA

Chief Technologist



Cicely Shilligford
Ro

STEM Young Leader

International Space Station: In-Space Production Opportunities

2021.04.15 • Webinar 11 am - 12 pm ET



Access to the microgravity environment of low Earth orbit offers industry production opportunities not possible terrestrially. This presentation will focus on ISS National Lab efforts around in-space production, manufacturing processes, and intellectual-property generation that enable new business growth and represent markets that could generate revenue from access to space.

Speaker



Ken Savin

International Space Station

Director, US National Lab
Scientific Partnering



NASA: Leveraging the Rover Landing and the Search for Life on Mars

2021.05.06 • Webinar 11 am - 12 pm ET



Talk to one of the key creators of humanity's most daring mission to the Red Planet to date: landing the Perseverance rover and Ingenuity--first helicopter outside of Earth--to conduct semi-autonomous research and exploration 173 million miles away. Find out the initial research results on the search for life on Mars and what is next at NASA for industry partnering and how you may help exploration beyond low Earth orbit.

Speaker



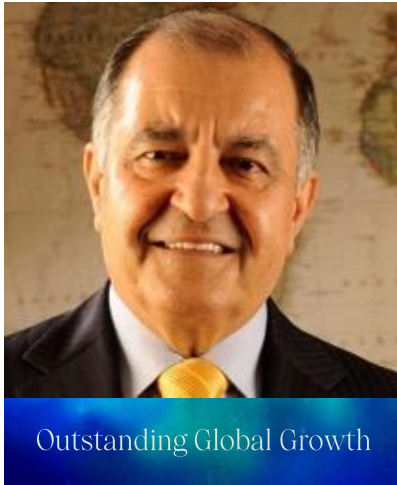
James Green

NASA

Chief Scientist

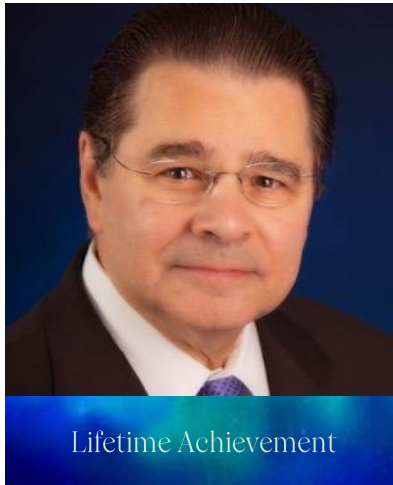


2021 Honorees



Seifi Ghasemi
Air Products

Chairman, President and CEO



Daniel Daniello
The Carlyle Group

Co-founder Chairman Emeritus



Ken Frazier
Merck & Co.

Chairman and CEO

Keynote

Event co-chairs



James Green
NASA

Chief Scientist



Bob Patel
LyondellBasell

CEO



Peter Coors
Molson Coors

Board Chair



Mathai Mammen
Johnson & Johnson

Global Head of R&D



Thank You



Diverse STEM Talent Leadership for
Sustainable Innovation since 1954

