

... on April 1-2 let's celebrate Apollo's 50!



IMAGE: JAMES VAUGHAN

Chemistry for Humanity's Next Giant Leap

ACS President Recommends -- Third ACS NASA Symposium -- Orlando
Day 1 NASA, PMSE Student & Mentor Awards

Day 2 Industry, Academia, CME Lectures: Frances Arnold, Eric Betzig*

* Limited free reception tickets and ACS Journal T-shirts -- cmeacs.org



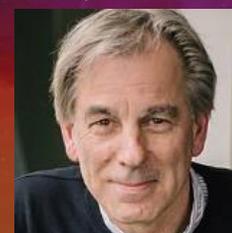
Takuzo Aida
Tokyo University



Seunghyun Sim
Caltech



Bas van Genabeek
SyMO-Chem



Bert Meijer
Eindhoven University

CME NASA Reception at the Kennedy Space Center

257th ACS National Meeting & Exposition

Third ACS NASA Symposium

Chemistry for Humanity's Next Giant Leap



April 1 • PM • PMSE Student & Mentor Awards

ACS GLOBAL OUTSTANDING GRADUATE STUDENT & MENTOR AWARDS IN POLYMER SCIENCE AND ENGINEERING

SPONSORED BY CME



Seunghyun Sim

Postdoc
Caltech



Bas van Genabeek

Researcher
SyMO-Chem



Takuzo Aida

Prof. Tokyo University
Riken Group Director



Bert Meijer

Distinguished Professor
Eindhoven University .

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December 10, 2019

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Celebrating the 50th Anniversary of the Moon Landing: 1969 July 20

Third ACS NASA Symposium

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ACS NY Section
CME

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NASA

April 1 • PM • PMSE Student & Mentor Presentations



2:00 pm – Awards Presentation and Talk on Engineering self-assembly of protein polymers for functional materials.

Seunghyun Sim – Proteins are monodisperse polymers that fold into a specific nanoscale structure. These state-of-art nanoscale machineries exert highly precise mechanical motions and process environmental inputs by the combination of allosteric effects. My research focuses on finding interdisciplinary solutions for designing a library of functional

protein materials, mainly from the principles in supramolecular chemistry, molecular biology, and polymer science. In this symposium, I will discuss the design of protein-based macromolecular architectures in multiple dimensions, understanding their property for the therapeutic application, and in situ synthesis of extracellular protein network by living organisms for generating engineered living materials.

Profile – Seunghyun Sim graduated from Seoul National University with B.S. degrees in Chemistry and Biological Sciences in 2012. She conducted her doctoral research with professor Takuzo Aida at the University of Tokyo and received her M.Eng. and Ph.D. in 2017. Her thesis work focused on engineering protein-based supramolecular nanostructures and functions. She is currently a postdoctoral fellow at California Institute of Technology in the lab of professor David Tirrell. Her research interests include engineering composite biomaterial with supramolecular protein polymers produced by living bacterial cells.



3:00 pm – Particular Noncovalent Bondings for Self-Healable Materials.

Takuzo Aida – Expanding the range of healable materials is an important challenge for the realization of sustainable societies. We report here that particular types of noncovalent interactions such as thiourea-mediated H-bonding and pyridine-mediated CH \cdots N bonding are suited for the construction of self-healable polymer glass (*Science* 2018, 359, 72–76) and porous

crystal (*Science* 2018, 361, 1242–1246), respectively. These self-healable materials have been awaited but considered essentially difficult to develop. The lecture will highlight how we tackled these ground challenges and addressed essential issues.

Profile – Takuzo Aida was born in 1956. He received his Ph.D. from the University of Tokyo in 1984, and then began his academic career there. In 1996, he was promoted to full professor at the University of Tokyo, and is now the deputy director for Riken Center for Emergent Matter Science. He is a soft matter scientist and has received many awards including ACS Award in Polymer Chemistry in 2009, Purple Ribbon in 2010, and Fujiwara Prize and Alexander von Humboldt Research Award in 2011, and more recently, Leo Esaki Prize in 2015, and Japan Academy Prize in 2018.

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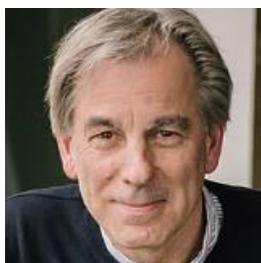


3:30 pm – Dispersy under Scrutiny: Exploring limits in block copolymer self-assembly.

Bas van Genabeek – The phase separation of block copolymer systems has been studied for copolymers in the intermediate dispersy regime. However, examples of truly monodisperse (synthetic) systems are scarce. To evaluate the limits of precision polymer synthesis and the segregation behavior of a perfectly defined polymeric system we developed scalable routes

for discrete length diblock co-oligomers based on dimethylsiloxane and lactic acid monomers. The phase separation of these low MW block co-oligomers such as an unprecedentedly high degree of ordering and extreme sensitivity toward dispersy.

Profile – In 2014 Bas received a B.S. in Chemical Engineering from Eindhoven University of Technology (TU/e). In 2018 he conducted pioneering research for his PhD thesis on the synthesis and study of the phase behavior of block co-oligomers with no chain length distribution in the laboratory at the TU/e. His distinguished awards include Young Talent Award by the Royal Holland Society of Sciences and the Unilever Research Prize for best master thesis, Dutch Polymer Days Plenary Lecture Award, and the LANXESS Talent Award. He works as organic chemist for contract research organization SyMO-Chem.



4:00 pm – Supramolecular polymerizations – chirality as a muse.

E.W. "Bert" Meijer – Macroscopic properties of polymers both in solution and solid state are the result of the macromolecular nature of the molecules. Current polymer arrays can exhibit some unprecedented behavior – like self-healing - as a result of the reversibility of the supramolecular design. Especially ordered arrays of monomers are highly interesting due to the cooperative

nature of their supramolecular polymerization processes that can be used to create artificial extracellular matrices, hydrogels and super-selectivity in molecular recognition. In the lecture, the concept of supramolecular polymers will be illustrated with an analysis of the pathways in this non-covalent polymerizations and how these supramolecular polymers are used.

Profile – Bert Meijer is Distinguished University Professor in the Molecular Sciences, Professor of Organic Chemistry at the Eindhoven University of Technology and co-director of the Institute for Complex Molecular Systems. After his PhD degree at the University of Groningen, he worked for 10 years in industry. In 1991 he was appointed in Eindhoven. Bert Meijer is a member of many editorial advisory boards, including the Journal of the American Chemical Society. Bert Meijer has received numerous awards, including the Spinoza Award and the ACS Award for Polymer Chemistry. He is a member of a number of academies and societies, including the Royal Netherlands Academy of Science.

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Bringing Together Industry, Academia, Government and the Public to Enlarge and Enhance the STEM Talent Pool

Cutting-edge developments in 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. Two days packed with inspirational research, industry, jobs.

April 1 – NASA Day

AM, PM – Select Researchers from NASA Research Centers including Glenn, Ames, JPL, Johnson, Goddard.

PM – ACS Global Outstanding Student & Mentor Awards in Polymer Science and Engineering sponsored by PMSE/CME.

April 2 – Industry & Academia Day

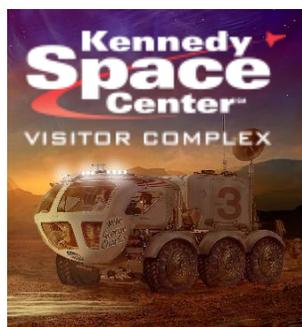
AM – Speakers: Dow Chemical, Johnson & Johnson, DuPont, Northrop Grumman, Harris Corp, Deloitte...

PM - *CME Lectures and Awards*: featuring **Frances Arnold**, Caltech Professor and 2018 Nobel Laureate, and **Eric Betzig**, HHMI Sr Fellow and 2014 Nobel Laureate.

CME Reception: 5 pm – 9 pm *Reception and Tour at NASA's Kennedy Space Center in Cape Canaveral.*

ACS Primary Sponsor: Multidisciplinary Program Planning Group (MPPG).

Organizers: Charles Brumlik, CME Vice Chair; George Rodriguez, CME Past Chair; and Ksenia Takhistova, CME Director; with the unwavering support from James Green, NASA's Chief Scientist and Tara Ruttley, NASA's Associate Chief Scientist for Microgravity Research.



Endorsements: 2019 ACS President Bonnie Charpentier, 2018 ACS President Peter Dorhout, 2017 ACS President Allison Campbell, 2016 ACS President Donna Nelson, NASA, the Chemical Marketing & Economics (CME) Group of the ACS New York Local Section

Co-Sponsors: Over 20 ACS Technical Divisions including AGFD, ANYL, BIOT, BIOL, BMGT, CELL, CHAL, CHAS, CHED, CINF, COLL, COMP, ENFL, ENVR, FLUO, GEOC, INOR, MEDI, NUCL, ORGN, PHYS, PMSE, POLY, PROF, and SCHB.

The CME Lectures includes limited complimentary ACS Journal T-shirts.

Symposium Registration: This Symposium is Free for ACS National Meeting Registrants. So ACS can send you program updates and assure right-sized rooms, register after Dec 10 for the Symposium and Reception at cmeacs.org.








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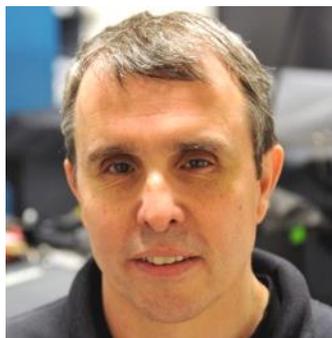


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NASA

April 2 • 12:00 – 3:30 PM • CME Luncheon & Lectures

2019 CME LECTURES



Eric Betzig

HHMI Sr Fellow
2014 Nobel Laureate



Frances Arnold

Caltech Professor
2018 Nobel Laureate

2019 CME LUNCHEON KEYNOTE



Pedro Duque

Spanish Minister of Science and Innovation. Former Astronaut at the European Space Agency.

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Partial List of Speakers • 1-2, 2019 • Orlando



Paul Stoffels, Johnson & Johnson, Chief Scientific Officer, Vice Chair Of The Executive Committee.



A.N. Sreeram, The Dow Chemical Company, Senior Vice President and Chief Technology Officer.



Pedro Duque, Spanish Minister of Science and Innovation. Astronaut at the European Space Agency.



David McConville, ExxonMobil Chemical, Vice President of Global Technology



Jon Arenberg, Northrop Grumman Aerospace Systems, Chief Engineer, Space Science Missions.



Murali Krishnan, Harris Corporation, Vice President and General Manager, ISR, Space & Intelligence Systems,



James Jeziorski, DuPont, Global Technology Manager.



Michael Meador, NASA Glenn Research Center Program Element Manager, Lightweight Materials & Mfg.



Robyn Gatens, NASA Human Exploration Directorate Deputy Director, International Space Station Division.

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2018 CME LECTURES



**Historic
Scientific
Achievement**

Robert S. Langer

MIT Koch Institute
Professor. The most
cited engineer in
history.



**Multi
Disciplinary
Innovation**

Emily A. Carter

Dean, School of
Engineering and
Applied Science,
Princeton.



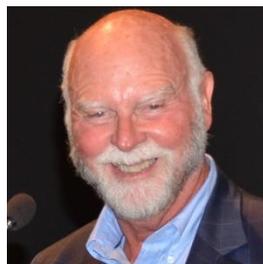
**Propelling
Space
Science**

James L. Green

NASA's Chief
Scientist. Former
Planetary Science
Division Director.

Tuesday August 21, 2018 - Westin Boston Waterfront

2018 CME LECTURES



**Historic
Scientific
Achievement**

J. Craig Venter

Co-Founder,
Executive Chairman,
Head of Scientific
Strategy of Human
Longevity, Inc.



**Fostering
Aerospace
Innovation**

Janet L. Kavandi

Director of NASA's
Glenn Research
Center and former
astronaut.



**Propelling
Science
Globally**

Harry B. Gray

Arnold O. Beckman
Professor of
Chemistry; Founding
Director, Beckman
Institute at Caltech.

Tuesday August 22, 2017 - National Air and Space Museum.

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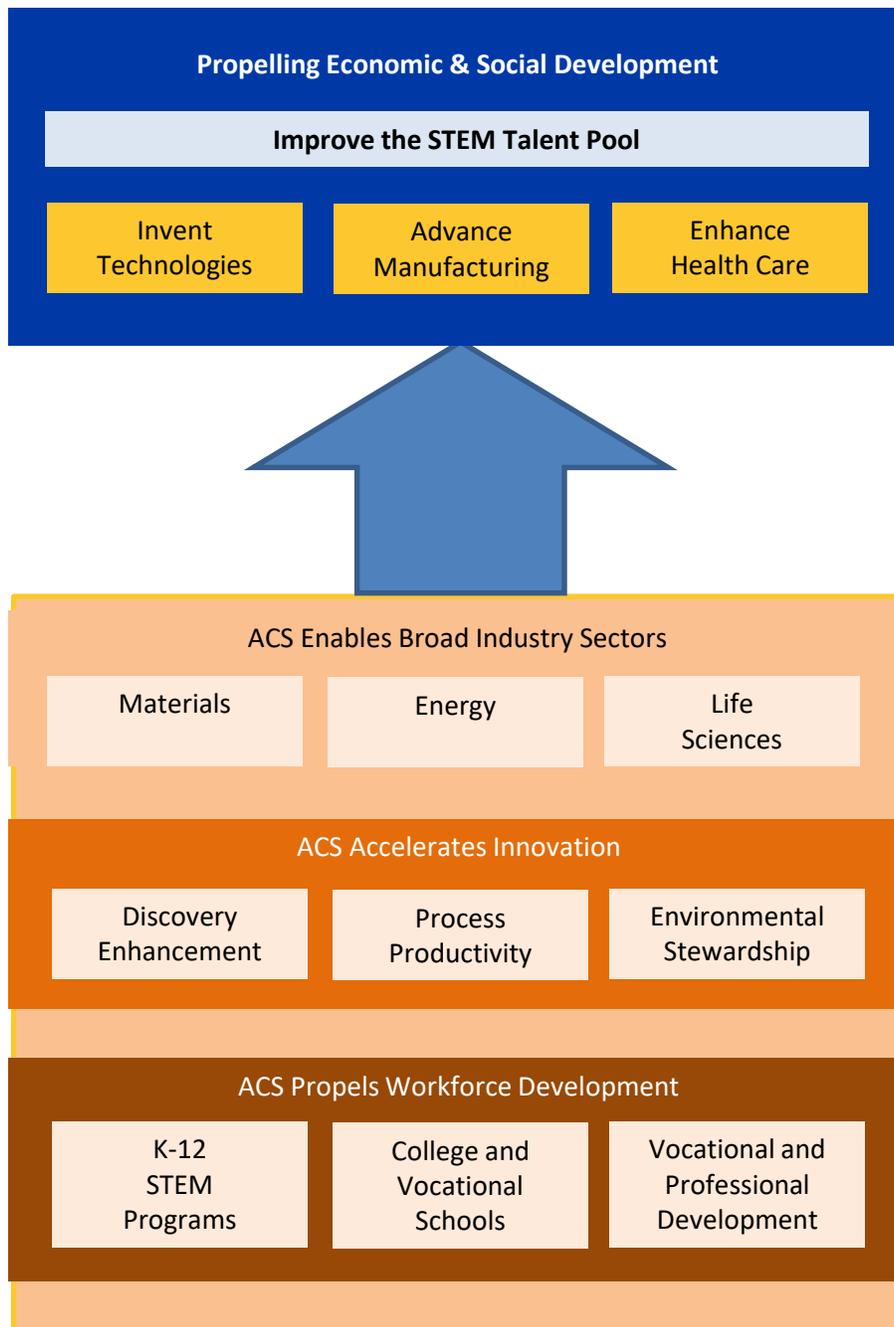


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CME ACS Enables STEM Talent Academia, Industry, and Government



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