The National Academies of
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Chemical Engineering in the 21st Century: Challenges and Opportunities
January 26-27, 2021
2:00 – 5:00 pm ET

Join Link:
https://nasem.zoom.us/j/93789363679?pwd=b1o3NklGUFBuUHlpVEJKVnY0bTJadz09

Tuesday, January 26th

Open Session Agenda

2:00 PM **Welcome and Meeting Overview**
Eric Kaler, Committee Chair

2:05 PM **Chemical Engineers' Role in Creating Practical Technologies**
Dr. William Banholzer
University of Wisconsin-Madison

3:05 PM **Food-Energy-Water Nexus - tentative**
Dr. Tony Ryan
Grantham Centre for Sustainable Futures

4:05 PM **Adjourn Open Session**

Wednesday, January 27th

Open Session Agenda

2:00 PM **Welcome and Day 2 Overview**
Eric Kaler, Committee Chair

2:05 PM **The Future of Engineering**
Dr. Norman R. Augustine
Lockheed Martin Corporation, retired

3:05 PM **Energy Resources and Future Energy Transitions**
Dr. Lynn M. Orr
Stanford University

4:05 PM **Adjourn Open Session**

Speaker Biographies

Norman R. Augustine (NAS, NAE) is retired chairman and CEO of Lockheed Martin Corporation. Upon retiring he joined the faculty of the Department of Mechanical and Aerospace Engineering at Princeton University. Previously, he has served as assistant secretary, undersecretary, and subsequently, acting secretary of the U.S. Army. He has been on the faculty of Princeton University, served as chairman and principal officer of the American Red Cross, and as chairman of the Defense Science Board. He has served as a member of the board of directors of ConocoPhillips, Black & Decker, Proctor & Gamble, and Lockheed Martin. He is a regent of the University System of Maryland, and has been a trustee of Princeton University, Massachusetts Institute of Technology, and The Johns Hopkins University. He has been a member of advisory boards to the Departments of Homeland Security, Energy, Defense, Commerce, Transportation, and Health and Human Services, as well as NASA, Congress and the White House. He has served for 16 years on the President's Council of Advisors on Science and Technology under both Republican and Democratic presidents. He is a member of the American Philosophical Society, Council on Foreign Relations, and a fellow of the American Academy of Arts and Sciences. He has received the U.S. National Medal of Technology, Joint Chiefs of Staff Distinguished Public Service Award, and for five times the Department of Defense's highest civilian decoration, the Distinguished Service Medal. He holds 34 honorary degrees. He is a member of the National Academy of Sciences, and a member and former chairman of the National Academy of Engineering. Dr. Augustine was raised in Colorado and attended Princeton University where he graduated with a BSE in Aeronautical Engineering, magna cum laude, and an MSE.

William F. Banholzer (NAE) is a Research Professor and Honorary Fellow at the University of Wisconsin-Madison with appointments in in the Chemical and Biological Engineering Department, Chemistry Department, and the Wisconsin Energy Institute. Dr. Banholzer has a strong history of technical excellence and innovation, spanning his more than 30 years of industrial experience. Before joining the University of Wisconsin-Madison, he was Corporate Vice President and Chief Technology Officer of The Dow Chemical Company. At Dow, he was a member of the Office of the Chief Executive and led Dow's research and development activities across the globe. Dr. Banholzer joined Dow in July 2005 from General Electric Company, where he was Vice President of Global Technology at GE Advanced Materials, responsible for worldwide technology and engineering. He was elected to the National Academy of Engineering in 2002. Dr. Banholzer earned master's and doctorate degrees in chemical engineering from the University of Illinois.

Franklin (Lynn) M. Orr Jr. (NAE) is Professor Emeritus at Stanford University. He has been a member of the Stanford faculty since 1985 and holds the Keleen and Carlton Beal Chair of Petroleum Engineering in the Department of Energy Resources Engineering, and was a Senior Fellow at the Woods Institute for the Environment and the Precourt Institute for Energy. Previously, he served as Under Secretary for Science and Energy at the US Department of Energy from December 2014 to January 2017. He was director of the Precourt Institute for Energy at Stanford from its establishment in 2009 to 2013. He served as director of the Global Climate and Energy Project from 2002 to 2008. Dr. Orr was the Chester Naramore Dean of the School of Earth Sciences at Stanford University from 1994 to 2002. His research activities focus on how complex fluid mixtures flow in the porous rocks in the Earth's crust, the design of gas injection processes for enhanced oil recovery, and CO2 storage in subsurface formations. Dr. Orr is a member of the National Academy of Engineering. He served as

vice chair of the board of directors of the Monterey Bay Aquarium Research Institute until 2014 and rejoined that board in 2017. He chaired the Advisory Panel of the Packard Fellowships for Science and Engineering for the David and Lucile Packard Foundation until 2014, rejoining that panel in 2017, and was a foundation board member from 1999-2008. He is a member of the ClimateWorks Foundation Board of Directors. Dr. Orr received his PhD from the University of Minnesota in Chemical Engineering.

Tony Ryan is the Professor of Physical Chemistry at the University of Sheffield and the founding Director of the Grantham Centre for Sustainable Futures. Dr. Ryan leads the University of Sheffield's program in sustainability research, integrating across traditional boundaries in the pure and applied sciences, engineering, medicine, and social sciences. Previously, he held a NATO Research Fellowship at the University of Minnesota, was a Lecturer, Senior Lecturer and Reader in Materials Science at The University of Manchester and was seconded to the Synchrotron Radiation Source at Daresbury. In 1997 he moved to Sheffield and served as Head of Chemistry before becoming the Pro Vice Chancellor for the Faculty of Science in 2008, a role which he fulfilled until 2016. His research covers sustainable synthesis, structure, processing, and applications of polymers using advanced analytical and measurement techniques. Recent research projects included renewable sources for polyurethane synthesis, organic photovoltaics, maximizing the properties of polymers and biopolymers through flow-induced crystallization, formulation of home and personal care products and polymer foams for high intensity urban agriculture. He has co-authored more than 300 papers ad patents and 2 books, "Polymer Processing and Structure Development" and "The Solar Revolution: One Planet, 10 Billion People, One Solution.” He holds a BSc and PhD from the University of Manchester and a DSc from UMIST.