2023 NAE Annual Meeting

ENGINEERING THE FUTURE FOR SUSTAINABILITY

October 1-2, 2023 | Washington, DC
The Trusted Voice of Engineering Leadership

Founded in 1964, NAE advances the welfare and prosperity of the nation by providing independent advice on matters involving engineering and technology, and by promoting a vibrant engineering profession and public appreciation of engineering. The NAE is part of the National Academies of Sciences, Engineering, and Medicine, an independent, nonprofit organization chartered by Congress to provide objective analysis and advice to the nation on matters of science, technology, and health.
CONTENTS

Sunday, October 1
Chair’s Remarks ................................................................. 3
President’s Address ............................................................. 3
Induction Ceremony ............................................................. 4
Special Lecture on Engineering and Society ......................... 5
Celebration of Life for Wm. A. “Bill” Wulf ............................. 6

Monday, October 2
Plenary Speaker ................................................................. 8
Awards Presentation ........................................................... 9
Guest Tours ........................................................................ 11
Forum ................................................................................ 12
Section Meetings ............................................................... 15
Reception & Dinner Dance .................................................. 15

General Information
Section Chairs ................................................................. 16
Registration and Store Hours ............................................. 17
Meeting Services ............................................................... 17
Transportation Schedule .................................................. 17 & 32
NAS Building Map ............................................................ 18
Area Map ......................................................................... 19

2022 Honor Roll of Donors ................................................ 21
### DAY 1: 2023 NAE ANNUAL MEETING

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00–11:45 am</td>
<td><strong>Brunch on the West Lawn</strong></td>
</tr>
<tr>
<td>10:00–11:30 am</td>
<td><strong>Underrepresented Minorities of the NAE Meeting and Brunch</strong> (members only)</td>
</tr>
<tr>
<td></td>
<td><strong>Lecture Room &amp; East Court</strong></td>
</tr>
<tr>
<td></td>
<td>The NAE established the Underrepresented Minorities of the National Academy of Engineering (URMNAE) member-led event in 2021 under the Racial Justice and Equity Committee. The event aims to discuss the progress in electing underrepresented minorities to NAE membership and other activities directed towards increasing racial and ethnic diversity in the engineering profession. All NAE members are welcome to attend and participate in discussions at this meeting.</td>
</tr>
<tr>
<td>10:00–11:30 am</td>
<td><strong>Planned Giving Seminar and Brunch</strong> (advance registration requested)</td>
</tr>
<tr>
<td></td>
<td><strong>Members’ Room</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Elana Lippa</strong></td>
</tr>
<tr>
<td></td>
<td><em>Director of Planned Giving, NASEM</em></td>
</tr>
<tr>
<td></td>
<td><strong>Save Taxes, Increase Impact, and Maximize Your Legacy</strong></td>
</tr>
<tr>
<td></td>
<td>Learn about options for estate and philanthropic planning to maximize what you leave to your family and favorite charities while minimizing taxes.</td>
</tr>
<tr>
<td></td>
<td><strong>Elana Lippa</strong> has helped donors create meaningful, tax-efficient gifts and planned and administered the planned giving marketing programs at five different organizations. She is currently treasurer of the Metropolitan Opera Competition, Mid-Atlantic Region, and has provided leadership as president of the National Capital Gift Planning Council (NCGPC).*</td>
</tr>
</tbody>
</table>
**Induction Ceremony**

**11:45 am–1:15 pm**

**Induction of the NAE Class of 2023**

Kavli Auditorium

The Induction Ceremony will open with remarks from NAE Chair Donald C. Winter, followed by President John L. Anderson’s address. The NAE Executive Officer Alton D. Romig, Jr., will then introduce the Members and International Members of the Class of 2023.

**Chair’s Remarks**

**Donald C. Winter**

*Chair, National Academy of Engineering*

Donald C. Winter, NAE chair (2020–24), is an independent consultant supporting national and international security interests in the US and allied nations. He served as the 74th Secretary of the Navy from January 2006 to March 2009. As Secretary of the Navy, he led America's Navy and Marine Corps Team and was responsible for an annual budget in excess of $125 billion and almost 900,000 people. Dr. Winter’s prior business career in the aerospace and defense industry spanned over 30 years as a systems engineer, program manager and corporate executive. From 2009 to 2020, he was a Professor of Practice at the University of Michigan, where he taught graduate level courses on systems engineering, satellite design, and maritime policy. Since 2011 he has served in multiple roles assisting the Commonwealth of Australia in their efforts to reconstruct the Royal Australian Navy’s fleet and establish a sustainable shipbuilding capability. During 2019 to 2021 he also served as the US DoD’s Senior Defense Industry Advisor for Ukraine. He received his BS from the University of Rochester and MS and PhD from the University of Michigan, all in physics. Dr. Winter currently serves as the chair of the US National Academy of Engineering (NAE).

**President’s Address**

**John L. Anderson**

*President, National Academy of Engineering*

*Vice Chair, National Research Council*

John L. Anderson began his six-year term as president of the National Academy of Engineering July 1, 2019. Previously, he was president of the Illinois Institute of Technology (IIT) and distinguished professor of chemical engineering (2007–15), and provost and executive vice president at Case Western Reserve University (CWRU) (2004–07). He worked at Carnegie Mellon University for 28 years, including 8 years as dean of the College of Engineering and 11 years as head of the chemical engineering department. He began his career as assistant professor of chemical engineering at Cornell University (1971–76). Dr. Anderson was elected to the NAE in 1992 “for contributions to the understanding of colloidal hydrodynamics and membrane transport phenomena.” He was elected an NAE councillor in 2015. His extensive service to the NAE includes serving as chair of the Membership Policy Committee, Nominating Committee, Chemical Engineering Section, and Chemical Engineering Peer Committee. For the National Academies he has chaired the Committee.
SUNDAY, OCTOBER 1

on Determining Basic Research Needs to Interrupt the Improvised Explosive Device Delivery Chain, and the Committee on Review of Existing and Potential Standoff Explosives Detection Techniques. Dr. Anderson is a fellow of the American Academy of Arts and Sciences and American Association for the Advancement of Science, and was appointed to the National Science Board (2014–20). He received the Acivos Professional Progress Award from the American Institute of Chemical Engineers and the National Engineering Award from the American Association of Engineering Societies. He earned a BS from the University of Delaware (1967) and PhD from the University of Illinois at Urbana-Champaign (1971), both in chemical engineering. He holds honorary doctorates from IIT, Case Western Reserve University, Rensselaer Polytechnic Institute, and the University of Delaware.

Emcee
Alton D. Romig, Jr.
Executive Officer, National Academy of Engineering

Alton D. Romig, Jr., is the NAE executive officer, responsible for program, financial, and membership operations. He was previously vice president and general manager of Lockheed Martin Aeronautics Company Advanced Development Programs, better known as the Skunk Works®. He joined Sandia National Laboratories as a member of the technical staff in 1979 and moved through a succession of R&D management positions leading to his appointment as executive vice president in 2005. He served as deputy laboratories director and chief operating officer until 2010, when he transferred to the Skunk Works. Dr. Romig is a member of the board of directors of Football Research, Inc., a nonprofit entity created and supported by the National Football League to review engineering technology to improve the safety of the sport. He serves or has served on numerous advisory committees for major universities as well as the board of the UK Atomic Weapons Establishment (2003–08), where he chaired the program committee. Dr. Romig is a fellow of TMS, IEEE, AIAA, and AAAS, and a fellow and honorary member of ASM International. He was elected to the NAE in 2003 “for outstanding contributions to the science and technology of materials and for innovative research and development on defense systems,” and he was elected to the Council on Foreign Relations in 2008. His extensive service to the National Academies includes terms on the Committee for Technology Insight: Gauge, Evaluate, and Review (chair) and Committee on Research, Development, and Acquisition Options for US Special Operations Command; and as chair of the NAE’s Committee on Membership, Materials Engineering Section, and Materials Engineering Peer Committee. He was awarded the ASM Silver Medal for Materials Research in 1988. Dr. Romig received his BS (1975), MS (1977), and PhD (1979) in materials science and engineering from Lehigh University.

1:15–1:30 pm

NAE Class of 2023 and Anniversary Members Group Photo

Class of 2023 and Anniversary Members (class of 1998) proceed with staff guidance through the Constitution Avenue Lobby to the Terrace.

1:15–2:00 pm

Break
SPECIAL LECTURE ON ENGINEERING AND SOCIETY

2:00–3:15 pm  

**Special Lecture on Engineering and Society:**  
*Engineering Ecosystems with AI*

Kavli Auditorium

Our society is struggling to engineer heterogeneous systems of people and technologies. For instance, our systems for dealing with pandemics, climate change, inequality, and financial stress have fallen short, in significant part because of unanticipated human behaviors. Perhaps as a consequence, Congress’s new infrastructure bill expands the definition of “infrastructure” to include human or social infrastructure. Drawing on examples from several countries and various domains, this lecture will illuminate new approaches to engineering ecosystems that better integrate human behavior and discuss how new technologies like large language models (LLMs) and privacy-enhancing technologies (PETs) are being applied to these problems.

**Speaker**

**Alex “Sandy” Pentland**  
*Professor of Media Arts and Sciences; Toshiba Professor, MIT*

Alex ‘Sandy’ Pentland directs MIT Connection Science, an MIT-wide initiative, and previously helped create and direct the MIT Media Lab. He is a member of advisory boards for the UN Secretary General, the UN Foundation, Consumers Union, the OECD, and formerly the American Bar Association, Google, AT&T, and Nissan. Professor Pentland is a member of the National Academy of Engineering, has an h-index of 149, and his lab’s spin-offs touch roughly 1/3 of humanity every day. He co-led the World Economic Forum discussion in Davos that led to the EU privacy regulation GDPR, and he was one of the UN Secretary General’s “Data Revolutionaries” helping to forge the transparency and accountability mechanisms in the UN’s Sustainable Development Goals. His most recent books are *Building the New Economy*, *Trusted Data*, and *Honest Signals*, all published by MIT Press, and *Social Physics*, published by Penguin. He earned a BGS (mathematics, statistics) from the University of Michigan and a PhD in AI and psychology from MIT.

**Moderator**

**Rodolphe Barrangou**  
*T. R. Klaenhammer Distinguished Professor, North Carolina State University*

Rodolphe Barrangou’s work focuses on the characterization of CRISPR-Cas systems and their applications in bacteria, especially for the study and development of probiotics, including for genotyping, phage resistance, screening, genome editing and antimicrobials. He spent nine years in R&D and M&A at Danisco and DuPont, and has been at NC State since 2013. For his CRISPR work, he received several international awards, notably the Canada Gairdner International Award, and he was elected to the National Academy of Sciences, the National Academy of Engineering, and the National Academy of Inventors. Dr. Barrangou earned a BS in biological sciences from Rene Descartes University, France; an
MS in biological engineering from the University of Technology in Compiègne, France; an MS in food science from NC State; a PhD in genomics from NC State; and an MBA from the University of Wisconsin-Madison. He is also the former chairman of the Board of Caribou Biosciences; a co-founder of Intellia Therapeutics, Locus Biosciences, TreeCo, Ancilia Biosciences, and CRISPR Biotechnologies; an advisor to Inari Ag, Invaio, Provaxus, Felix Biotech, and the IGI; and the editor in chief of the CRISPR Journal.

Special Lecture on Engineering and Society Committee

The Special Lecture on Engineering and Society was added to the Annual Meeting events to introduce engineers and the public to issues at the intersection of technology and society. We are grateful to the Committee for their outstanding efforts in identifying a very timely topic and a thought-provoking speaker.

Per F. Peterson, Chair
Paula Marques Alves
William F. Baker
Rodolphe Barrangou
Cleopatra Cabuz

H. Polat Gulkan
Kimberly Prather
Mauela Veloso
William Woodburn

Special thanks to the committee members noted for accomplishing their mission!

3:15–4:00 pm  Break
Celebration of Life
Wm. A. “Bill” Wulf, NAE President 1996-2007
1939-2023

Bill Wulf is remembered and revered by the National Academies community for his service as NAE president from 1996-2007. He was a dynamic advocate of the critical role of engineering and technology in quality of life, in national and homeland security, and in globally sustainable development. He was a tireless promoter of the US engineering research enterprise as essential to the nation's economic well-being and global competitiveness. He eloquently made the case for more diverse representation in the engineering community writ large. And, recognizing the need for active consideration of ethics in engineering, he brought an online ethics center to the NAE’s website, a resource that became a full-fledged program.

Bill's greatest passion was for efforts to galvanize the engineering education community to consider ways to improve the education of the next generation of engineers, and he expanded the NAE's programmatic activities across a broad spectrum of issues. He promoted international engagement through the Frontiers of Engineering program, supported outreach and diversity through the creation of the EngineerGirl program, encouraged public understanding of engineering through the publication of A Century of Innovation, which celebrates the 20 greatest engineering achievements of the twentieth century, and initiated the effort to identify the Grand Challenges for Engineering in the twenty-first century.

Bill was elected to the NAE in 1993 “for professional leadership and for contributions to programming systems and computer architecture," having distinguished himself in academia as a faculty member at Carnegie Mellon University and the University of Virginia, in the federal government as the National Science Foundation's Assistant Director for Computer and Information Science and Engineering, and in entrepreneurship as cofounder—with his wife, NAE member Anita Jones—of Tartan Labs, a compiler technology company that was purchased by Texas Instruments.

The NAE and the engineering community at large owe Bill a great debt of gratitude. His legacy lives on.

5:30–6:30 pm  Reception on the West Lawn
6:30–9:30 pm  Golden Bridge Dinner in the Great Hall (invitation only)
6:30–9:30 pm  Section Dinners/Reception, off-site (if your section is holding an event)
MONDAY, OCTOBER 2

DAY 2: 2023 NAE ANNUAL MEETING

7:15–8:15 am  Continental Breakfast on the West Lawn

7:15–8:15 am  International Secretary Meeting and Breakfast in the Members’ Room (International Members & Guest only)

8:15–9:00 am  Plenary Speaker

Sustainability: The Defining Challenge and Opportunity of the 21st Century

Kavli Auditorium

The world is embarking on the largest transformation humanity has ever undertaken. This transformation requires a paradigm shift of unprecedented proportions because of the increase in the global population from 8 billion people to 10 billion by mid-century and the transition from a $100 trillion global economy based largely on carbon-based energy to one that has zero net emissions by the end of this century. Research and education, and their use to innovate scalable solutions, are key to creating a sustainable world where humanity and our planet can thrive together.

Welcome

Alton D. Romig, Jr.
Executive Officer, National Academy of Engineering

Speaker

Arun Majumdar
Chester Naramore Dean, Stanford Doerr School of Sustainability; Jay Precourt Professor of Mechanical Engineering & Energy Science and Engineering, Stanford University

Arun Majumdar is the Jay Precourt Professor of Mechanical Engineering & Energy Science and Engineering and a senior fellow and the former director of the Precourt Institute for Energy. He is also a faculty member in the Department of Materials Science and Engineering (by courtesy) and in the Department of Photon Science at SLAC. He served in the Obama administration as the founding director of the Advanced Research Projects Agency-Energy (ARPA-E) and as the acting under secretary of energy. He served as a science envoy for the US Department of State and currently serves as the chair of the US Secretary of Energy Advisory Board. Dr. Majumdar was also vice president for energy at Google and advises numerous businesses in the energy innovation ecosystem. He is a member of the National Academy of Sciences, the US National Academy of Engineering, and the American Academy of Arts and Sciences. He received his bachelor's degree in mechanical engineering at the Indian Institute of Technology, Bombay, and his PhD from the University of California, Berkeley.
9:00–9:45 am

Awards Presentation
Kavli Auditorium

Moderator

Wesley L. Harris
Vice President, National Academy of Engineering

Wesley L. Harris began his tenure as NAE vice president in July 2022. He is the Charles Stark Draper Professor of Aeronautics and Astronautics at MIT, where he was previously head of the Aeronautics and Astronautics Department. During his distinguished career, Dr. Harris has served as associate administrator for aeronautics at NASA, vice president and chief administrative officer at the University of Tennessee Space Institute, and dean of the School of Engineering and professor of mechanical engineering at the University of Connecticut. Dr. Harris was elected to the NAE in 1995 and has served as chair and member of numerous boards and committees of the NAE, NRC, NSF, US Army Science Board, USRA, and several state governments as well as the AIAA, AHS, and NTA. Dr. Harris earned a BS in aerospace engineering from the University of Virginia and a PhD in aerospace and mechanical sciences from Princeton University.

Simon Ramo Founders Award

The Simon Ramo Founders Award, the oldest award presented by the National Academy of Engineering, was established in 1965 to honor an outstanding NAE member or international member who has upheld the ideals and principles of the NAE through professional, educational, and personal achievement and accomplishment.

2023 Award Recipient

Robert W. Conn
Distinguished Policy Fellow, School of Global Policy and Strategy, and Walter Zable Distinguished Professor and Dean, Emeritus, Jacobs School of Engineering, University of California, San Diego; President and CEO, Emeritus, The Kavli Foundation

“For shaping national science and technology policy through leadership in academia, business, and philanthropy and for seminal contributions to fusion engineering.”

Robert W. Conn has been a leader in academia, research, business, philanthropy, and national science and technology policy for more than 50 years. He is currently a Distinguished Policy Fellow and Pacific Rim Fellow at UC San Diego’s School of Global Policy and Strategy. From 2009 until his retirement in 2020, Dr. Conn was president and CEO of the Kavli Foundation, a nonprofit based in Los Angeles with a mission to advance science for the benefit of humanity. He served as the first dean of UC San Diego’s Jacobs School of Engineering from 1994 to 2002, where he guided the school to its rise as one of the top twelve engineering schools in the country.
As a leading researcher in fusion engineering and fusion energy systems, first at the University of Wisconsin, Madison, then at UCLA, and finally at UC San Diego, Dr. Conn pioneered the design of fusion energy systems, identifying the major physics and engineering challenges facing the development of practical fusion energy. He co-founded and served as the first director of Wisconsin's Fusion Technology Institute and later established and led UCLA's Institute of Plasma and Fusion Research.

Dr. Conn is a member of the National Academy of Engineering and a fellow of the American Physical Society and the American Nuclear Society. He earned a BS in chemical engineering from the Pratt Institute and both an MS in mechanical engineering and a PhD in engineering science from the California Institute of Technology.

Arthur M. Bueche Award Recipient

The Arthur M. Bueche Award of the National Academy of Engineering recognizes an engineer who has been actively involved in determining US science and technology policy, promoting technological developments, and contributing to the enhancement of relations between industries, government, and universities.

2023 Award Recipient

David L. Tennenhouse
Senior Advisor, Directorate for Technology, Innovation, and Partnerships (TIP), National Science Foundation

“For the conception, implementation, and stewardship of information technology R&D involving unique partnerships among academia, industry, and government.”

David Tennenhouse has a track record of driving innovation in multiple domains. He worked in academia as a faculty member at MIT; in government at DARPA and the NSF; in industry at Intel, Amazon, Microsoft, and VMware; and as a partner in a venture capital firm. As a senior advisor within the NSF’s TIP Directorate, Dr. Tennenhouse focuses on enhancing US competitiveness through the acceleration of use-inspired, translational research and development. Before joining the NSF, he was the chief research officer at VMware, where he led activities to enhance and extend VMware’s technology leadership. Dr. Tennenhouse joined VMware from Microsoft, where he was a corporate vice president and led their Technology Policy Group. He was previously a partner at New Venture Partners, where he focused on the creation of spinouts from corporate R&D teams.

At DARPA and in the private sector, Dr. Tennenhouse has been involved in the strategic planning and execution of programs related to a wide range of technologies, including distributed/cloud computing, networking, computer architecture, storage, wireless communications, machine learning, search/data mining, image processing, robotics, microelectromechanical systems, healthcare, and nanotechnology/biotechnology. As a faculty member at MIT, he led pioneering research on high-speed networking, software-based video processing, software-defined networks, software radio, and telecommunications policy.
Dr. Tennenhouse holds bachelor’s and master’s degrees in electrical engineering from the University of Toronto and a PhD from the University of Cambridge. He is a fellow at the IEEE and the Canadian Academy of Engineering, and he has been a member of numerous government, university, and industry advisory boards.

**Installation and Naming of the George and Virginia Bugliarello International Secretary**

The Virginia and George Bugliarello NAE International Secretary position was endowed and named by Virginia Bugliarello-Wondrich in honor of her late husband, George Bugliarello, who served as the NAE’s international secretary for two terms and represented our membership across the globe with distinction and grace from 2003-2011. Dr. Aubry was elected to serve as the NAE’s International Secretary and began a four-year term starting in July 1, 2023. As a result of this new title and support, the Office of the International Secretary will be empowered to provide greater support and services to our international members and be more engaged with the global engineering community.

**Nadine Aubry** is an internationally recognized scholar and academic leader who has made notable contributions to fluid dynamics, particularly the reduced modeling of turbulence and other complex flows, and microfluidics. She was elected to the NAE in 2011 and has served as a council member since 2018. Dr. Aubry is a former Provost and senior vice president of Tufts University where she oversaw its eight degree-granting schools and numerous interdisciplinary programs, centers, and institutes on its multiple campuses. She also served as Dean of the College of Engineering at Northeastern University from 2012 to 2019 and was head of the Department of Mechanical Engineering at Carnegie Mellon University, where she was the Raymond J. Lane Distinguished Professor and University Professor.

**9:15 am–2:00 pm**

**Guest Tours**

Meet in the Great Hall of the NAS building

Each tour includes moderate walking. Comfortable walking shoes and clothing are suggested. Both tours will conclude with lunch at The Capital Grille Restaurant, Washington, DC.

**The Hirshhorn Museum tour**

The Hirshhorn Museum shares the transformative power of modern and contemporary art with the widest possible audiences. As a leading voice for contemporary art and culture, it is committed to providing the artists of today a global platform to explore new ways to create, with performance, digital media, video, and technology. The tour is approximately 1.5 hours.

**Kennedy Center tour**

Enjoy a journey through the lovely halls and theaters of the Kenedy Center, where you will learn the history of the building, see stunning artworks and gifts from many countries, and visit the theaters where the arts come alive. This tour is approximately 1 hour and 15 minutes.

**9:45–10:30 am**

**Break**
10:30 am–12:30 pm  Engineering the Future for Sustainability: Measuring and Communicating Our Progress  Kavli Auditorium

“Sustainability is living on nature's income rather than living on its capital.”  
~ Murray Gell-Mann

Sustainability connotes different things to different individuals. To engineers, sustainability may best be captured in the United Nations’ 17 Sustainability Goals. More challenging than defining sustainability is measuring our progress towards a sustainable future. To borrow from Murray Gell-Mann's analogy: How do we know whether we are spending our income or capital? How do we even keep track of nature's income? As a broad concept, "sustainability" demands a better definition. As a societal goal, it also requires measurement. Measurements are critical to society's acceptance of the fact that we are making progress. Measurements also assist us in determining whether we are spending nature's income or capital. What are the best measurements to use to assess progress towards sustainability? How do we best measure the cradle-to-grave impacts of sustainable technologies? Life cycle analysis (LCA) is one broadly used methodology. What are some of the others? Can we develop better tools or metrics for charting progress towards sustainability? Even if we are able to agree on the methodologies and metrics useful in measuring progress towards sustainability, how do we convince ourselves that the data are meaningful? Members of our engineering and scientific communities who are authorities on sustainability, tools for measuring sustainability, and social acceptance will discuss ways in which we measure sustainability and gain society's buy-in of what constitutes progress in moving towards a sustainable future for our planet.

Topics:

**Decision Support and Innovation to Understand Risks and Opportunities**
Sarah Kapnick  
Chief Scientist, National Oceanic and Atmospheric Administration

**Measuring, Reporting, and Verifying Product Sustainability Metrics**
David Allen  
Norbert Dittrich-Welch Chair in Chemical Engineering, Director of the Center for Energy and Environmental Resources, and Co-Director of the Energy Emissions Modeling and Data Lab, University of Texas at Austin

**How Tools and Methodologies Can Support Sustainability Decisions**
Erkan Erdem  
UPartner and National Leader of Economic Services Practice, KPMG LLP

**Sustainability: The Defining Challenge and Opportunity of the 21st Century**
Arun Majumdar  
Chester Naramore Dean of the Stanford Doerr School of Sustainability; Jay Precourt Professor of Mechanical Engineering & Energy Science and Engineering, Stanford University
Welcome
Alton D. Romig, Jr.
Executive Officer, National Academy of Engineering

Moderator
Deanne Bell
TV Host and Founder/CEO, Future Engineers

Panelists
Sarah Kapnick is responsible for guiding the programmatic focus of the National Oceanic and Atmospheric Administration’s (NOAA) science and technology priorities. Previously, Dr. Kapnick served as a physical scientist and deputy division leader at NOAA’s Geophysical Fluid Dynamics Laboratory (GFDL). Her work spanned seasonal climate prediction, mountain snowpack, extreme storms, water security, climate economics, and climate impacts. She was a recipient of the NOAA Albritton Outstanding Science Communicator Award, the American Geophysical Union Cryosphere Early Career Award, and the National Science Foundation postdoctoral fellowship award. Most recently, she served as a managing director at J.P. Morgan, functioning as senior climate scientist and sustainability strategist for Asset and Wealth Management, supporting sustainability and climate action efforts, and serving as an advisor on new business and investment opportunities and risks. Additionally, she co-founded a renewable energy forecasting startup and has held positions at a voluntary carbon registry and Goldman Sachs. Dr. Kapnick earned a PhD in atmospheric and oceanic sciences with a certificate in Leaders in Sustainability from UCLA and an AB in mathematics with a certificate in finance from Princeton University.

David Allen is the author of seven books and more than 300 papers, primarily in the areas of air quality, greenhouse gas emissions, the engineering of sustainable systems, and the development of materials for environmental and engineering education. He served on a variety of governmental advisory panels and, from 2012 to 2015, chaired the US Environmental Protection Agency’s Science Advisory Board. In 2017, he was elected to the National Academy of Engineering (Section 3: Chemical Engineering) and in 2020 he received the ENI Energy Transitions Award in recognition of his work on methane emissions from oil and gas systems. Professor Allen earned his BS in chemical engineering from Cornell University in 1979 and his MS and PhD degrees in chemical engineering from the California Institute of Technology in 1981 and 1983, respectively.

Erkan Erdem is an experienced economist with expertise in data analytics, program evaluation, policy analysis, econometrics, and financial modeling. He supports both government agencies and private clients with a variety of analyses and solutions, such as social impact analyses and climate risk assessments. Dr. Erdem supports leading law firms with economic analyses and has testimony experience in federal court. He has published in peer-reviewed journals and frequently presents at national conferences. He taught graduate-level econometrics at the University of Maryland as an adjunct professor for many years. Dr. Erdem earned a BA in economics and a BS in mathematics from Koç University, Istanbul, Turkey, and a PhD in economics from Penn State University.
Moderator

Deanne Bell is an engineer, television host, and entrepreneur. Her television hosting credits include PBS, ESPN, Discovery Channel, National Geographic, DIY Network, and CNBC’s *Make Me a Millionaire Inventor*. She is the founder and CEO of Future Engineers, an education technology company that engages students in online contests and challenges. Future Engineers’ inaugural competition, developed with the ASME Foundation and NASA, produced historic achievements including the first student-designed 3D print in space, and her company was selected by NASA to host the Mars 2020 “Name the Rover” contest. Ms. Bell worked at Raytheon for 3 years as an optomechanical engineer, initially focused on packaging FLIR into a helicopter-mounted gimbal, involving redesign of the afocal telescope and packaging of the cryo-cooled imager and CCD camera. She then worked for other R&D programs at the company, including as head of the mechanical design and build of a synthetic aperture ladar (SALTI) optical test bench. She earned a BS in mechanical engineering at Washington University, St. Louis, and is the 2019 Young Alumni Award recipient for its McKelvey School of Engineering. She is also the featured interviewee in the fall 2019 issue of the NAE’s *The Bridge*.

2023 NAE Annual Meeting Program Committee

The annual meeting programmatic theme, *Engineering the Future for Sustainability*, was chosen by a committee of NAE members from each section, keeping diversity in mind with respect to gender, ethnicity, work sector (business, academia, other), and tenure of membership. Their mission was to plan a meeting topic and identify speakers that would entice and inspire the members and other attendees during this annual gathering.

Anne K. Roby, Co-Chair
Alton D. Romig, Jr., Co-Chair
Luiz Andre Barroso
Thomas P. Bostick
Corale L. Brierley
Franklin Carrero-Martinez
Emily A. Carter
Thomas F. Degnan, Jr.

Sidney J. Green
Kathryn J. Jackson
Timothy C. Lieuwen
Deborah J. Nightingale
Leonard Pinchuk
John F. Reid
Julie M. Schoenung
Richard M. Swanson

Special thanks to the committee for accomplishing its mission!
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:30–1:30 pm</td>
<td><strong>Lunch on the West Lawn</strong></td>
</tr>
<tr>
<td>12:30–1:30 pm</td>
<td><strong>Women of the NAE Meeting and Lunch</strong> <em>(members only)</em></td>
</tr>
<tr>
<td></td>
<td>Lecture Room &amp; East Court</td>
</tr>
<tr>
<td></td>
<td>The NAE established the Women of NAE (WNAE) member-led event in 2019. The event aims to build on the recommendations that came out of the June meeting, and to identify concrete goals, objectives, timelines, and volunteers to move from conversation to action, in support of the NAE objectives to increase diversity of nominations, including the diversity of successful nominations. All NAE members are welcome to attend and participate in discussions at this meeting.</td>
</tr>
<tr>
<td>2:00–5:00 pm</td>
<td><strong>Section Meetings</strong> <em>(members only)</em></td>
</tr>
<tr>
<td></td>
<td>NAS and Keck</td>
</tr>
<tr>
<td></td>
<td><strong>NAS Building, 2101 Constitution Avenue NW</strong></td>
</tr>
<tr>
<td>02</td>
<td>Bioengineering</td>
</tr>
<tr>
<td>05</td>
<td>Computer Science</td>
</tr>
<tr>
<td>06</td>
<td>Electric Power/Energy Systems</td>
</tr>
<tr>
<td>08</td>
<td>Industrial, Manufacturing &amp; Operational Systems</td>
</tr>
<tr>
<td>11</td>
<td>Earth Resources</td>
</tr>
<tr>
<td></td>
<td><strong>NAS 125, Board Room</strong></td>
</tr>
<tr>
<td></td>
<td><strong>NAS 280, Members’ Room</strong></td>
</tr>
<tr>
<td></td>
<td><strong>NAS 250</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Keck Center, 500 Fifth Street NW</strong></td>
</tr>
<tr>
<td>01</td>
<td>Aerospace</td>
</tr>
<tr>
<td>03</td>
<td>Chemical</td>
</tr>
<tr>
<td>04</td>
<td>Civil &amp; Environmental</td>
</tr>
<tr>
<td>07</td>
<td>Electronics, Communications &amp; Information Systems</td>
</tr>
<tr>
<td>09</td>
<td>Materials</td>
</tr>
<tr>
<td>10</td>
<td>Mechanical</td>
</tr>
<tr>
<td>12</td>
<td>Special Fields &amp; Interdisciplinary</td>
</tr>
<tr>
<td></td>
<td><strong>Keck 208, Keck 106, Keck 100, Keck 206, Keck 100, Keck 209</strong></td>
</tr>
<tr>
<td>6:30–7:30 pm</td>
<td><strong>Dinner Dance Reception</strong></td>
</tr>
<tr>
<td></td>
<td>JW Marriott</td>
</tr>
<tr>
<td>7:30–midnight</td>
<td><strong>Dinner Dance</strong></td>
</tr>
<tr>
<td></td>
<td>JW Marriott</td>
</tr>
<tr>
<td></td>
<td>Wrap up the NAE Annual Meeting to the tunes of the Odyssey Band, featuring a repertoire from jazz to swing to rock and roll. Members and their guests are welcome to dance until midnight. Black Tie optional.</td>
</tr>
</tbody>
</table>
Section Chairs

Note: Numbers following Section Chairs’ names denote primary and secondary NAE section affiliations. Terms end June 30 of year shown.

Section 1: Aerospace Engineering
Alan H. Epstein (1)
Vice President, Tech & Environment (retired)
Pratt & Whitney
(2025)

Section 7: Electronics, Communication & Information Systems Engineering
Bernd Girod (7, 5)
Robert L. and Audrey S. Hancock Professor
Stanford University
(2024)

Section 2: Bioengineering
Gordana Vunjak-Novakovic (2, 3)
University Professor; The Mikati Foundation Prof of Biomedical Eng & Medicine
Columbia University
(2024)

Section 8: Industrial, Manufacturing & Operational Systems Engineering
Shmuel S. Oren (8,6)
Professor of the Graduate School The Earl J. Isaac Chair Professor
University of California, Berkeley
(2024)

Section 3: Chemical Engineering
Chaitan Khosla (3, 2)
Professor
Stanford University
(2024)

Section 9: Materials Engineering
Julia M. Phillips (9, 7)
VP & Chief Technology Officer (retired)
Sandia National Laboratories
(2024)

Section 4: Civil & Environmental Engineering
Jon D. Magnusson (4)
Chairman Emeritus - Senior Principal
Magnusson Klemencic Associates, Inc.
(2025)

Section 10: Mechanical Engineering
Roger L. McCarthy (10, 12)
National Academy of Engineering Treasurer
McCarthy Engineering
(2024)

Section 5: Computer Science & Engineering
Manuela Veloso (5)
Head, AI Research & Herbert A. Simon University Professor Emerita
JPMorgan Chase & Co.
(2024)

Section 11: Earth Resources Engineering
Birol Dindoruk (11)
Chief Scientist of Reservoir Physics Reservoir Engineering
Shell International E&P Inc.
(2024)

Section 12: Special Fields and Interdisciplinary Engineering
Suzanne M. Vautrinot (12)
Director
Battelle Memorial Institute
(2024)

Section 6: Electric Power/Energy Systems Engineering
Jay Giri (6)
Director, GE Grid Software Solutions (retired)
GGM Consulting
(2025)
GENERAL INFORMATION

Registration Hours
Sunday, October 1, 10:00 am–6:00 pm
Monday, October 2, 7:00 am–2:00 pm

NAE Store Hours
Sunday, October 1, 10:00 am–3:00 pm
Monday, October 2, 7:00 am–2:00 pm

MEETING SERVICES

Food Service
Efforts are made to provide healthy, nutritionally balanced meals at all meetings. If you have special dietary restrictions or any questions about food service, please see Robbin Wu in the registration room (NAS 120).

Information Desk
The NAE Information Desk is in the Great Hall of the NAS Building. Staff will be available to provide assistance and answer questions about the Annual Meeting and your NAE membership.

IT Help Desk
The NASEM IT Help Desk is in the Members’ Center of the NAS Building. Staff will be available to provide assistance with printing boarding passes or accessing the internet.

Logo Items and Rosettes
NAE logo items are available for purchase at the NAE Store (NAS 118).

Lost and Found
Lost and found is located in the registration room (NAS 120).

Medical Assistance
For medical assistance go to the Information Desk in the Great Hall of the NAS Building. An emergency medical technician (EMT) will be onsite.

Mother’s Room
The NAS Building Mother’s Room is in NAS 355. The Keck Center Mother’s Room is in Keck 336.

Smoking Policy
Smoking is not permitted in any building of the National Academies. Please use designated outdoor areas.

TRANSPORTATION

Sunday, October 1
Departs at 9:45 a.m. as directed, last bus departs NAS Building at 6:45 p.m. JW Marriott NAS Building
Departs at 9:30 p.m. as directed, last bus departs at 9:45 p.m. (Golden Bridge) NAS Building JW Marriott

Monday, October 2
Departs at 6:45 a.m. as directed, last bus departs at 12:30 p.m. JW Marriott NAS Building
Departs at 1:15 p.m. and every 15 minutes, last bus departs at 1:45 p.m. NAS Building Keck Center
Departs at 4:00 p.m. and every 15 minutes, last bus departs at 5:30 p.m. NAS Building JW Marriott
Departs at 4:00 p.m. and every 15 minutes, last bus departs at 5:30 p.m. Keck Center JW Marriott

Transportation for Saturday, September 30, Guest Tours, and Pick-up and Drop-off locations may be found on the TRANSPORTATION schedule on page 32.
Thank you to the Academy members and friends who generously support our work through their annual donations.

Your support plays a critical role in everything we do, and enables the Academy to provide leadership in a world of accelerating change.
2022 Honor Roll of Donors

We greatly appreciate the generosity of our donors. Your contributions enhance the impact of the National Academy of Engineering’s work and support its vital role as advisor to the nation. The NAE acknowledges contributions made as personal gifts or as gifts facilitated by the donor through a donor-advised fund, matching gift program, or family foundation. The gifts reflected on this list are as of December 31, 2022.

LIFETIME GIVING SOCIETIES
We gratefully acknowledge the following members and friends who have made generous charitable lifetime contributions. Their collective, private philanthropy enhances the impact of the academies as advisor to the nation on matters of science, engineering, and medicine.

THE ABRAHAM LINCOLN SOCIETY
In recognition of members and friends who have made lifetime contributions of $1 million or more to the National Academy of Sciences, National Academy of Engineering, or National Academy of Medicine. Boldfaced names are NAE members.

Bruce and Betty Alberts
Richard and Rita* Atkinson
Norman R. Augustine
Craig and Barbara Barrett
Jordan and Rhoda Baruch*
Stephen D. Bechtel, Jr.*
Arnold and Mabel Beckman*
Leonard Blavatnik
Harry E. Bovay, Jr.*
Donald Bren
George* and Virginia Bugliarello
Ralph J.* and Carol M. Cicerone
Harvey V. Fineberg and Mary E. Wilson
Bernard M. Gordon
Cecil H. Green*
John O. and Candace E. Hallquist
Michael and Sheila Held*
Jane E. Henney and Robert Graham
William R. and Rosemary B. Hewlett*
Ming and Eva Hsieh
Irwin and Joan Jacobs
Robert L.* and Anne K. James
Kenneth A. Jonsson*
Fred Kavli*
Daniel E. Koshland, Jr.*
Tillie K. Lubin*
Whitney* and Betty MacMillan
John F. McDonnell
George P. Mitchell*
The Ambrose Monell Foundation
Gordon and Betty Moore
Philip and Sima Needleman
Peter O’Donnell, Jr.*
Gilbert S. Omenn and Martha A. Darling
Jonathan B. and Donna J. Perlin
Robert* and Mayari Pritzker
Richard L. and Hinda G. Rosenthal*
Martine A. Rothblatt
Jack W. and Valerie Rowe
Fritz J. and Dolores H. Russ Prize Fund of the Russ College of Engineering and Technology at Ohio University
William J. Rutter
Bernard and Rhoda Sarnat*
Leonard D. Schaeffer
Sara Lee and Axel Schupf
James H. and Marilyn Simons
John and Janet Swanson
Marci and James J. Truchard
Anthony J. Yun and Kimberly A. Bazar
Anonymous (1)

THE BENJAMIN FRANKLIN SOCIETY
In recognition of members and friends who have made lifetime contributions of $500,000 to $999,999 to the National Academy of Sciences, National Academy of Engineering, or National Academy of Medicine. Boldfaced names are NAE members.

John and Pat Anderson
Rose-Marie and Jack R. Anderson*
John and Elizabeth Armstrong
Kenneth E. Behring*
Gordon Bell
Elkan R.* and Gail F. Blout
Russell L. Carson
Charina Endowment Fund
James McConnell Clark*
Barry and Bobbi Coller
Henry David*
Richard Evans*
Eugene Garfield Foundation
Theodore Geballe*
Penny and Bill George,
George Family Foundation
Christa and Detelef Glose
William T.* and
Catherine Morrison Golden
Alexander Hollaender*
Thomas V. Jones*
Cindy and Jeong Kim
Ralph and Claire Landau*
Asta and William W. Lang*
Marsha K. McNutt
Ruben F.* and Donna Mettler
Dane* and Mary Louise Miller
Oliver E. and Gerda K. Nelson*
Sheila and Kumar Patel
Henry and Susan Samueili
Herbert A. and Dorothea P. Simon*
Raymond S. Stata
Roy and Diana Vagelos
Andrew and Erna* Viterbi
Alan M. Voorhees*
Anonymous (2)

*Deceased
THE MARIE CURIE SOCIETY
In recognition of members and friends who have made lifetime contributions of $250,000 to $499,999 to the National Academy of Sciences, National Academy of Engineering, or National Academy of Medicine. Boldfaced names are NAE members.

The Agouron Institute
W.O. Baker*
Warren L. Batts
Elwyn* and Jennifer Berlekamp
Daniel and Lana Branton
Gail H. Cassell
Chau-Chyun and Li-Li Chen
Clarence S. Coe*
Rosie and Stirling A. Colgate*
W. Dale and Jeanne C. Compton*
Lance and Susan Davis
Nicholas M. Donofrio
David and Miriam Donoho
Ruth and Victor Dzau
James O. Ellis, Jr. and Elisabeth Paté-Cornell
Dotty* and Gordon England
William L.* and Mary Kay Friend
George and Christine Gloeckler
Paul and Judy Gray
Diane E. Griffin
Jerome H.* and Barbara N. Grossman
Wesley L. Harris
John L. Hennessy
Chad and Ann Holliday
William R. Jackson*
Anita K. Jones
Mary and Howard Kehrl*
Kent Kresa
Mark and Becky Levin
Frances and George Ligler
Stella and Steve Matson
William W. McGuire
Janet and Richard M.* Morrow
Clayton Daniel and Patricia L. Mote
Ralph S. O'Connor*
Kenneth H. Olsen*
Larry* and Carol Papay
Stephen Quake
Ann and Michael Ramage
Simon A. Ramo*
Anne and Walt* Robb
Matthew L. Rogers and Swati Mylavarapu
Julie and Alton D. Romig, Jr.
Stephen* and Anne Ryan
H.E. Simmons*
Edward C. Stone
Ted Turner
Judy Swanson
Leslie L. Vadasz
Martha Vaughan*
Charles M.* and Rebecca M. Vest
Robert and Robyn Wagoner
Susan R. Wessler
Wm. A. Wulf
Anonymous (2)

THE EINSTEIN SOCIETY
In recognition of members and friends who have made lifetime contributions of $100,000 to $249,999 to the National Academy of Sciences, National Academy of Engineering, or National Academy of Medicine. Boldfaced names are NAE members.

Laura E. and John D. Arnold
Holt Ashley*
Nadine Aubry and John L. Batton
Francisco J. and Hana Ayal
William F. Ballhaus, Sr.*
David Baltimore
Thomas D.* and Janice H. Barrow
H.H. and Eleanor F. Barschall*
Sunanda Basu
Donald and Joan Beall
Daniel and Frances Berg
Diane and Norman Bernstein*
Bharati and Murty Bhavaraju
Chip and Belinda Blankenship
Erich Bloch*
Barry W. Boehm*
Gopa and Arindam Bose
Paul F. Boulos
David G. Bradley
Lewis M. Branscomb
John and Sharon Braman
Sydney Brenner*
Lenore and Rob Briskman
Malin Burnham
Ursula Burns and Lloyd Bean*
Eugen and Cleopatra Cabuz
Christine Cassel and Michael McCally
Josephine Cheng
Priscilla and Sunlin* Chou
John and Assia Cioffi
Paul Citron and Margaret Carlson Citron
A. James Clark*
Ellen Wright Clayton and Jay Clayton
G. Wayne Clough
John D. Corbett*
Pedro M. Cuatrecasas
Roy Curtiss and Josephine Clark-Curtiss
Ruth David and Stan Dains
Jeffrey Dean and Heidi Hopper
Zhonghan John Deng
Roman W. DeSanctis
Julie H. and Robert J. Desnick
Robert* and Florence Deutsch
Paul M. Doty*
Charles W. Duncan, Jr.*
George and Maggie Eads
Robert and Cornelia Eaton
The Eleftheria Foundation
Emanuel and Peggy Epstein*
Thomas E. Everhart
Peter Farrell
Michiko So* and Lawrence Finegold
Tobie and Daniel J.* Fink
Delbert A. and Beverly C. Fisher
George and Ann Fisher
Robert C.* and Marilyn G. Forney
Harold K.* and Betty Forsen
Edward H. Frank and Sarah G. Ratchye
Sid Gilman and Carol Barbour
Elsa M. Garmire and Robert H. Russell
Melinda F. Gates
William H. Gates III
Louis V. Gerstner, Jr.
Nan and Chuck* Geschke
Jack and Linda Gill
Sid Gilman and Carol Barbour
Martin E. and Lucinda Glicksman
Avram Goldstein*
Robert W. Gore*
2022 Honor Roll of Donors

Robert K. Grasselli* and Eva-Maria Hauck-Grasselli
Diane Greene and Mendel Rosenblum
Corbin Gwaltney* Carol K. Hall
Margaret A. Hamburg and Peter F. Brown
William M. Haney III
George* and Daphne Hatsopoulos
Robert M. Hauser
John G. Hildebrand and Gail D. Burd
Lyda Hill
Jane Hirsh
Michael W. Hunkapiller
Catherine Adams Hutt and Peter Barton Hutt
Jennie S. Hwang
M. Blakeman Ingle
Trina and Michael Johns
Richard B. Johnston, Jr.
Trevor O. Jones
Robert E. Kahn and Patrice A. Lyons
Thomas Kailath
Paul and Julie Kaminski
Yuet Wai and Alvera Kan
John and Wilma Kassakian
Diana S. and Michael D. King
Leon K. and Olga Kirchmayer*
Frederick A. Klingenstein*
William I. Koch
Gail F. Koshland
Jill Howell Kramer
John W. Landis*
Janet and Barry Lang
Louis Lange
Ming-wai Lau
Gerald and Doris Laubach
Edward D. Lazowska and Lyndsay C. Downs
David M.* and Natalie Lederman
Peter and Susan Lee
Bonnie Berger and Frank Thomson Leighton
Thomas M. Leps*
Jane and Norman N. Li
R. Noel Longuemare, Jr.
Asad M., Gowhartaj, and Jamal Madni
Davis L. Masten and Christopher Ireland
Jane and Roger L. McCarthy
Michael and Pat McGinnis
Burt* and Deedee McMurtry
Rahul Mehta
G. William* and Ariadna Miller
Ronald D. Miller
Stanley L. Miller*
Sanjit K. and Nandita Mitra
Sharon and Arthur Money
Joe and Glennna Moore
David* and Lindsay Morgenhaler
Narayana and Sudha Murty
Jaya and Venky Narayanamurti
Ellen and Philip Neches
Norman F. Ness
Ronald and Joan Nordgren
Susan and Franklin M. Orr, Jr.
David Packard*
Roberto Padovani
Charles and Doris Pankow*
Jack S. Parker*
Nirmala and Arogyaswami J. Paulraj
Edward E. Penhoet
Percy A. and Olga Pierre
Allen E.* and Marilynn Puckett
Alexander Rich*
Arthur D. Riggs*
Ronald L. Rivest
Eugene* and Ruth Roberts
Christopher Rogers
Howie Rosen and Susan Doherty
Henry M. Rowan*
Joseph E. and Anne P. Rowe*
Jonathan J. Rubinstein
John M. Samuels, Jr.
Linda S. Sanford
Maxine L. Savitz
Walter Schlup*
Wendy and Eric Schmidt
Nicole Shanahan
Richard P. Simmons
Harold C. and Carol H. Sox
Robert F. and Lee S. Sproull
Georges C. St. Laurent, Jr.
Arnold and Constance Stancell
Richard J. and Bobby Ann Stegemeier
F. William Studier
Michael Albert and Elizabeth Ann Sutton
Thomas and Marilyn Sutton
Charlotte and Morris Tanenbaum
Sridhar Tayur and Gunjan Kedia
Peter* and Vivian Teets
Hemant K. and Suniti Thapar
Samuel O. Thier
Leonard Kent* and Kayleen Thomas
James M. Tien and Ellen S. Weston
Gary and Diane Tooker
Katherine K. and John J. Tracy
Holly and Jeff Ullman
John C. Wall
David Walt and Michele May
Patricia Bray-Ward and David C. Ward
James N. Weinstein
Robert* and Joan Wertheim
Robert M.* and Mavis E. White
John C. Whitehead*
Jean D. Wilson*
Ken Xie
Tachi* and Leslie Yamada
Yannis and Sheryl Yortsos
Adrian Zaccaria*
Alejandro Zaffaroni*
Peter Zandan
Janet and Jerry Zucker
Anonymous (3)

*Deceased
GOLDEN BRIDGE SOCIETY
In recognition of NAE members and friends who have made lifetime contributions totaling $20,000 to $99,999. Boldfaced names are NAE members.

$75,000 to $99,999
Kristine L. Bueche
Rita Vaughn and Theodore C.* Kennedy
Johanna M.H. Levelt Sengers
James K. and Holly T. Mitchell
John Neerhout, Jr.
Cathy and Paul S.* Peercy
Robert E.* and Mary L. Schafrik
Lisa T. Su
Elias A. Zerhouni

$50,000 to $74,999
Andreas and Juana Acrivos
Jane K. and William F. Ballhaus, Jr.
Becky and Tom Bergman
Corale L. Brierley
James A. Brierley
Corbett Caudill
William Cavanaugh
Selim A. Chacour
Vinay and Uma Chowdhry
Joseph M. Colucci
The Crown Family
Gerard W. Elverum
Edith M. Flanigen
Samuel C. Florman
Louis V. Gerstner, Jr.
Elizabeth and Paul H.* Gilbert
Joseph W. Goodman
Priscilla and Paul E.* Gray
Kathy and Albert Greenberg
Evelyn L. Hu and David L. Clarke
James R.* and Isabelle Katzer
Terri L. Kelly
Kathryn S. and Peter S. Kim
Louis J. and M. Yvonne DeWolf Lanzerotti
Ricard A. Meserve
Darla and George E.* Mueller
Jane and Alan Mulally
Cynthia J. and Norman A.* Nadel
Robert M.* and Marilyn R. Nerem
Buddy Ratner and Cheryl Cromer
Ellen and George A.* Roberts
Leo John* and Joanne Thomas
David W. Thompson
Darsh T. Wasan
Sheila E. Widnall
A. Thomas Young
William and Sherry Young

$20,000 to $49,999
Linda M. Abriola and Larry M. Albert
Ilesanmi and Patience Adesdia
Rodney C. Adkins
Jane E. and Ronald J. Adrian
Alice Merner Agogino
Ann and Monty Alger
Valerie and William A. Anders
John C. Angus
Seta and Diran Apelian
Frances H. Arnold
Ruth and Ken Arnold
Kamla* and Bishnu S. Atal
Wanda M. and Wade Austin
Arthur B. and Carol Baggeroer
Clyde* and Jeanette Baker
William F. Baker
William F. Banholzer
David K. Barton
Diane and Samuel W.* Bodman
Mark T. Bohr
Rudy and Anna Bonaparte
Kathleen and H. Kent Bowen
Andrei Z. Broder
Rodney A. Brooks
Alan C. Brown*
Andrew and Malaney L. Brown
Robert L. Byer
Federico Capasso and Paola Salvini-Capasso
François J. Castaing
Sigrid and Vint Cerf
Joe H. and Doris W.L. Chow
Rosemary L. and Harry M. Conger
Kay and Gary Cowger
Natalie W. Crawford
Mary Czerwinski
Glen T. and Patricia B. Daigger
David and Susan Daniel
Ingrid Daubechies and Robert Calderbank
Carl de Boor
Pablo G. Debnedetti
Mary and Raymond Decker
Tom and Bettie Deen
Elisabeth M. Drake
E. Linn Draper, Jr.
James J. Duderstadt
Stephen N. Finger
Bruce and Pat Finlayson
Anthony E. Fiorato
G. David Forney, Jr.
Efi Foufoula-Georgiou and Tryphon Georgiou
Katharine G. Frase and Kevin P. McAuliffe
Douglas W. and Margaret P. Fuerstenau
Richard L. and Lois E. Garwin
Arthur and Helen Geoffrion
Eduardo D. Glandt
Arthur L. and Vida F. Goldstein
Hermann K. Gummel*
Eli Harari
Joyce and James Harris
Janina and Siegfried Hecker
Robert and Darlene Hermann
David* and Susan Hodges
Grace and Thom Hodgson
Urs Höelzel
Lee Hood and Valerie Logan Hood
John Howell and Susan Conway
J. Stuart Hunter
Ray R. Irani
Wilhelmina and Stephen Jaffe
Leah H. Jamieson
Edward G.* and Naomi Jefferson

*Deceased
2022 Honor Roll of Donors

Kristina M. Johnson
Michael R. Johnson
John L. and Nancy E. Junkins
Eric W. and Karen F. Kaler
Min H. Kao
James L. Kirtley, Jr.
Albert S. and Elizabeth M. Kobayashi
Demetrious Koutsoftas
James N. Krebs
Lester C.* and Joan M. Krogh
Ellen J. Kullman
Michael and Christine Ladisch
David C. Larbalestier
Yoon-Woo Lee
Frederick J. Leonberger
Burn-Jeng Lin
Jack E. Little
Robert G. Loewy
William J. MacKnight
Thomas* and Caroline Maddock
Thomas J. Malone
David A. Markle
Robert D. Maurer
Dan and Dalia* Maydan
Jyoti* and Aparajita Mazumder
Kiran Mazumdar-Shaw
James C. McGroddy
Larry V. McIntire
Kishor C. Mehta
R.K. Michel
James J. Mikulski
Susan M. and Richard B. Miles
Duncan T. Moore
Charles W. Moorman
Van and Barbara Mow
Matt O’Donnell
Thomas J. Overbye
Claire L. Parkinson
Aliene and Thomas K. Perkins
Lee* and Bill Perry
Donald E. Petersen
Julia M. Phillips and John A. Connor
Leonard and Diane Fineblum Pinchuk
John W. and Susan M. Poduska
Dana A. Powers
William F. Powers
Henry H. Rachford, Jr.
Srilatha and Prabhakar Raghavan
John F. and Diane Reid
Kenneth and Martha Reifsnider
Thomas J. Richardson
Richard J.* and Bonnie B. Robbins
Bernard I. Robertson
Ann K. Roby
Mary Ann and Thomas Romesser
Howie Rosen and Susan Doherty
William B. and Priscilla Russel
Vinod K. Sahney
Steve* and Kathryn Sample
Jerry Sanders III
Kathryn Sarpong
Donna and Jan Schilling
Ronald V. Schmidt
Fred B. Schneider and Mimi Bussan
William R. Schowalter
Lyle H. Schwartz
Sharon and Norman Scott
Surendra P. Shah
Martin B. and Beatrice E.* Sherwin
Heung-Yeung (Harry) Shum and Ka Yan
Megan J. Smith
Alfred Z. Spector and Rhonda G. Kost
David B. and Virginia H. Spencer
Gunter Stein
Ann and Ken Stinson
Yongkui Sun
Gaye and Alan Taub
Rosemary and George Tchobanoglous
Matthew V. Tirrell
Jean W. Tom
James A. Trainham and Linda D. Waters
John R. Treichler
Cody and Richard Truly
David M. Van Wie
Raymond Viskanta *
Thomas H. and Dee M. Vonder Haar
Albert R.C. and Jeannie Westwood
David and Tilly Whelan
George M. Whitesides
Ward O. and Mary Jo Winer
Donald and Linda Winter
Edgar S. Woolard, Jr.
Israel J. Wygnanski
Teresa and Steve Zinkle
Mary Lou and Mark D. Zoback
Charles F. Zukoski
Anonymous (2)

*Deceased
HERITAGE SOCIETY

In recognition of members and friends who have included the National Academy of Sciences, National Academy of Engineering, or National Academy of Medicine in their estate plans or who have made some other type of planned gift to the Academies. Boldfaced names are NAE members.

H. Norman* and Idelle Abramson*  
Gene M.* and Marian Amdahl  
John* and Elizabeth Armstrong  
Joan* and Edward Anders  
John C. Angus  
Norman R. Augustine  
Jack D. Barchas  
Harrison H. and Catherine C.* Barrett  
Stanley Baum*  
Clyde J. Behney  
Ruth Behrens  
C. Elisabeth Belmont  
Daniel and Frances Berg  
Paul Berg*  
Bobbie A. Berkowitz  
Elkan R.* and Gail F. Blout  
Enriqueta C. Bond  
Daniel and Lana Branton  
Robert and Lillian Brent*  
Coralie L. Brierley  
James A. Brierley  
Lenore and Rob Briskman  
Kristine L. Bueche  
Dorit Carmelli  
Peggy and Thomas* Caskey  
Barbara and Don Chaffin  
A. Ray Chamberlain  
Linda and Frank Chisari  
Rita K. Chow  
Paul Citron and Margaret Carlson Citron  
John A. Clements  
Morrel H. Cohen  
Stanley N. Cohen  
Graham A Colditz and Patti L. Cox  
Ross and Stephanie Corotis  
Ellis* and Betsy Cowling  
Barbara J. Culliton  
Glen T. and Patricia B. Daigger  
David and Susan Daniel  
Julie H. and Robert J. Desnick  
Peter N. Devreotes  
Ruth and Victor Dzau  
Gerard W. Elverum  
Dotty* and Gordon England  
Emanuel and Peggy Epstein*  
Harvey V. Fineberg and Mary E. Wilson  
Tobie and Daniel J.* Fink  
Robert C.* and Marilyn G. Forney  
William L.* and Mary Kay Friend  
Arthur and Helen Geoffrion  
Elisabeth and Paul H.* Gilbert  
Sid Gilman and Carol Barbour  
Martin E. and Lucinda Glicksman  
George and Christine Glocckler  
Christa and Detlef Glege  
Joseph W. Goodman  
Chushiro* and Yoshiko Hayashi  
Jane Henney and Robert Graham  
Bradford H. Gray  
John G. Hildebrand and Gail D. Burd  
John R. Howell and Susan Conway  
Peter M. Howley  
Catherine Adams Hutt and Peter Barton Hutt  
Nancy S. and Thomas S. Inui  
Richard B. Johnston, Jr.  
Anita K. Jones  
Jerome Kagan*  
Michael Katz and Robin J. Roy  
Diana S. and Michael D. King  
Michael D. Laimore  
Norma M. Lang  
Brian A. Larkin  
Marigold Linton and Robert Barnhill  
Daniel P. Loucks  
Ruth Watson Lubic  
R. Duncan* and Carolyn Scheer Luce  
Thomas* and Caroline Maddock  
Asad and Taj Madni  
Rudolph A. Marcus  
Pat and Jim McLaughlin  
Jane Menken  
Sharon and Arthur Money  
Van and Barbara Mow  
Mary O. Mundinger  
Philip and Sima Needleman  
Norman F. Ness  
Ronald and Joan Nordgren  
Godrey P. Oakley  
Gilbert S. Omenn and Martha A. Darling  
Bradford W. and Virginia W. Parkinson  
Zack T. Pate  
Neil and Barbara Pedersen  
Cathy and Paul S.* Peercy  
James J. Reissa, Jr.  
Emanuel P. Rivers  
Richard J.* and Bonnie B. Robbins  
Eugene* and Ruth Roberts  
Julie and Alton D. Romig, Jr.  
James F. Roth*  
Esther and Lewis* Rowland  
Sheila A. Ryan  
Paul R. Schimmel  
Stuart F. Schlossman  
Rudi* and Sonja Schmid  
Vern L. and Deanna D. Schramm  
Susan C. Scrimshaw  
Kenneth L. Shine  
Arnold and Constance Stancell  
H. Eugene Stanley  
Harold Stark  
Rosemary A. Stevens  
John and Janet Swanson  
Esther Sans Takeuchi  
Paul and Pamela Talalay*  
Walter and Marti Unger  
Robert and Robyn Wagener  
John C. Wall  
Patricia Carey-Ward and David C. Ward*  
Clare M. Waterman  
Robert* and Joan Wertheim  
C. Kern Wildenthal  
Gail and Robert Wilensky  
Richard Witter  
Maw-Kuen Wu  
Wm. A. Wulf*  
Tilahun D. Yilma  
Michael and Leslee Zubkoff  
Anonymous (1)

*Deceased
LOYALTY SOCIETY

In recognition of members and friends who have made gifts to the National Academies of Sciences, Engineering, and Medicine for at least 20 years. Boldfaced names are NAE members.

François M. Abboud
H. Norman Abramson*
Andreas and Juanita Acivros
Stephen Adler
Dyanne D. Affonso
Bruce and Betty Alberts
Barbara W. Alpert
Lawrence K. Altman
John and Pat Anderson
Wyatt W. Anderson
John C. Angus
John and Elizabeth Armstrong
Edward M. Arnett*
Joan K. Austin
K. Frank Austen
Arthur B. and Carol Baggeroer
Donald W. Bahr
John R. Ball
Robert W. Balluff*i
Jack D. Barchas
Clyde F. Barker
Jeremiah A. Barondess
Angela Barron McBride
Gordon Baym and Cathrine Blom
Terry and Roger N. Beachy
Marlene and Georges Belfort
Gordon Bell
Leslie Z. Benet
Paul Berg
Kenneth I. Berns
Carla F. Berry
Mina J. Bissell
Marie McCormick and Robert Blendon
Floyd E. Bloom
Jack L. Blumenthal
Barry W. Boehm*
Richard J. Bonnie
Lillian C. Borrone
Kathleen and H. Kent Bowen
Thompson Bowles
Lewis M. Branscomb
John and Sharon Brauman
W. F. Brinkman
Alan C. Brown
Donald D. Brown
Joseph A. Buckwalter
Kathleen Coen Buckwalter
Kristine L. Bueche
Jack E. Buffington
George* and Virginia Bugliarello
Martin Bukvac
Eugenio Calabi
James D. Callen
François Castaing
Webster and Jill Cavenee
Barbara and Don Chaffin
David R. and Jacklyn A. Challoner
Rita K. Chow
Ralph J.* and Carol M. Cicerone
George W. Clark
Michael and Adriana Clegg
John A. Clements
Linda Hawes Clever
Morrel H. Cohen
Mary Sue Coleman
Barry and Bobbi Collier
Richard A. Conway
R. James and Beverly Cook
Max D. Cooper
Nicholas R.* and Linda A. Cozzarelli
Pedro M. Cuatrecasas
William H. Danforth*
G. Brent and Sharon A. Dalrymple
James E. Darnell, Jr.
Ruth David and Stan Danis
Lance and Susan Davis
Igor B. and Keiko O. Dawid
Mary and Raymond Decker
Tom and Bettie Deen
Roman W. DeSanctis
Don E. Detmer
William H. Dietz
Nicholas M. Donofrio
Albert A. Dorman
Irwin Dorros
E. Linn Draper, Jr.
James J. Duderstadt
Lewis S. Edelheit
David and Lucy T. Eisenberg
Robert and Ingrid Eisenman
Gerard W. Elverum
Emanuel and Peggy Epstein*
Robert M. Epstein
W.G. Ernst
John V. Evans
Thomas E. Everhart
Gary Felsenfeld
Stanley Fields
Harvey V. Fineberg and Mary E. Wilson
Tobie and Daniel J.* Fink
Delbert A. and Beverly C. Fisher
Edith M. Flanigen
Kent V. Flannery
Samuel C. Florman
G. David Forney, Jr.
Harold K.* and Betty Forsen
Henry W. Foster, Jr.
T. Kenneth Fowler
Hans and Verena Frauenfelder
Carl Frieden
William L.* and Mary Kay Friend
Mitchell H. Gail
Theodore V. Galambos
Joseph G. Gall
Ronald L. Geer*
E. Peter Geiduschek*
Louis V. Gerstner, Jr.
Nan and Chuck* Geschke
John P. Geyman
Elizabeth and Paul H.* Gilbert
David Ginsburg
David V. Goeddel
Lewis R. Goldfrank
Richard J. Goldstein
Joseph W. Goodman
Richard M. Goody
Enoch Gordis
Emil C. Gotschlich
Roy W. Gould*
Bradford H. Gray
Shirley and Harry Gray
Margie and Larry A. Green
John S. Greenspan
Robert B. Griffiths
Paul F. Griner
Michael Grossman
Hermann K. Gummel*
Philip C. Hanawalt

*Deceased
## 2022 Honor Roll of Donors

<table>
<thead>
<tr>
<th>Name</th>
<th>Foundation/Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wesley L. Harris</td>
<td>Janina and Siegfried Hecker</td>
</tr>
<tr>
<td>John H. Hennessy</td>
<td>Donald R. Helinski</td>
</tr>
<tr>
<td>Adam Heller</td>
<td>Arthur H. Heuer</td>
</tr>
<tr>
<td>George J. Hirasaki</td>
<td>John P. Hirth</td>
</tr>
<tr>
<td>John L. Hennessy</td>
<td>David* and Susan Hodges</td>
</tr>
<tr>
<td>Janina and Robert Graham</td>
<td>Joseph F. Hoffman</td>
</tr>
<tr>
<td>Donald R. Helinski</td>
<td>Frank Hole</td>
</tr>
<tr>
<td>Arthur H. Heuer</td>
<td>Edward E. Hood, Jr.*</td>
</tr>
<tr>
<td>George J. Hirasaki</td>
<td>Thomas F. Hornbein</td>
</tr>
<tr>
<td>John P. Hirth</td>
<td>Peter M. Howley</td>
</tr>
<tr>
<td>John L. Hennessy</td>
<td>Sarah and Dan Hrdy</td>
</tr>
<tr>
<td>Janina and Robert Graham</td>
<td>Catherine Adams Hutt and</td>
</tr>
<tr>
<td>Donald R. Helinski</td>
<td>Peter Barton Hutt</td>
</tr>
<tr>
<td>Arthur H. Heuer</td>
<td>Richard and Fleur Hynes</td>
</tr>
<tr>
<td>George J. Hirasaki</td>
<td>Nancy S. and Thomas S. Inui</td>
</tr>
<tr>
<td>John P. Hirth</td>
<td>Robert L.* and Anne K. James</td>
</tr>
<tr>
<td>Janina and Robert Graham</td>
<td>Paul C. Jennings</td>
</tr>
<tr>
<td>John L. Hennessy</td>
<td>James O. Jirsa</td>
</tr>
<tr>
<td>Joseph F. Hoffman</td>
<td>Donald L. Johnson</td>
</tr>
<tr>
<td>Frank and Pam Joklik</td>
<td>Anita K. Jones</td>
</tr>
<tr>
<td>Marshall G. Jones</td>
<td>Paul and Julie Kaminski</td>
</tr>
<tr>
<td>Melvin F. Kanninen</td>
<td>John and Wilma Kassakian</td>
</tr>
<tr>
<td>Paul and Julie Kaminski</td>
<td>Samuel L. Katz and</td>
</tr>
<tr>
<td>John and Wilma Kassakian</td>
<td>Catherine* M. Wilfert</td>
</tr>
<tr>
<td>Paul C. Jennings</td>
<td>K.I. Kellermann</td>
</tr>
<tr>
<td>James O. Jirsa</td>
<td>Charles F. Kennel</td>
</tr>
<tr>
<td>Donald L. Johnson</td>
<td>Judson and Jeanne King</td>
</tr>
<tr>
<td>Frank and Pam Joklik</td>
<td>Miles V. Klein</td>
</tr>
<tr>
<td>Anita K. Jones</td>
<td>Albert S. and Elizabeth M. Kobayashi</td>
</tr>
<tr>
<td>Marshall G. Jones</td>
<td>Andrew H. Knoll</td>
</tr>
<tr>
<td>Melvin F. Kanninen</td>
<td>Joanne Knopoff</td>
</tr>
<tr>
<td>Paul and Julie Kaminski</td>
<td>Jill Howell Kramer</td>
</tr>
<tr>
<td>John and Wilma Kassakian</td>
<td>Edward A. and Kathyn F. Kravitz</td>
</tr>
<tr>
<td>Samuel L. Katz and</td>
<td>James L. Lammie*</td>
</tr>
<tr>
<td>Catherine* M. Wilfert</td>
<td>Norma M. Lang</td>
</tr>
<tr>
<td>K.I. Kellermann</td>
<td>James S. and Elinor G.A. Langer</td>
</tr>
<tr>
<td>Charles F. Kennel</td>
<td>Louis J. and M. Yvonne DeWolf</td>
</tr>
<tr>
<td>Judson and Jeanne King</td>
<td>Lanzerotti</td>
</tr>
<tr>
<td>Miles V. Klein</td>
<td>Joyce C. Lashof*</td>
</tr>
<tr>
<td>Albert S. and Elizabeth M. Kobayashi</td>
<td>Gerald and Doris Laubach</td>
</tr>
<tr>
<td>Edward A. and Kathyn F. Kravitz</td>
<td>Judith R. Lave</td>
</tr>
<tr>
<td>James L. Lammie*</td>
<td>Cynthia and Robert Lawrence</td>
</tr>
<tr>
<td>Norma M. Lang</td>
<td>Marvin &amp; Annette Lee Foundation:</td>
</tr>
<tr>
<td>James S. and Elinor G.A. Langer</td>
<td>David Lee, Trustee</td>
</tr>
<tr>
<td>Louis J. and M. Yvonne DeWolf</td>
<td>Anthony Leggett</td>
</tr>
<tr>
<td>Lanzerotti</td>
<td>Ellen Lehman</td>
</tr>
<tr>
<td>Joyce C. Lashof*</td>
<td>I. Robert Lehman</td>
</tr>
<tr>
<td>Gerald and Doris Laubach</td>
<td>Margaret A. LeMone</td>
</tr>
<tr>
<td>Judith R. Lave</td>
<td>Alan and Agnes Lesher</td>
</tr>
<tr>
<td>Cynthia and Robert Lawrence</td>
<td>Johanna M.H. Levelt Sengers</td>
</tr>
<tr>
<td>January and Robert Graham</td>
<td>Howard Leventhal</td>
</tr>
<tr>
<td>Cynthia and Robert Lawrence</td>
<td>Peter W. Likins</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Nathan and Barbara Liskov</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Jack E. Little</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Robert G. Loewy</td>
</tr>
<tr>
<td>New York, NY</td>
<td>J. Ross MacDonald</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Anthony P. Mahowald</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Donald C. Malins</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Vincent T. Marchesi</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Joyce Marcus</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Rudolph A. Marcus</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Robert C. Marini</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Margo P. Marshak</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Ida M. Martinson</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Robert D. Maurer</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Marie McCormick and Robert Blendon</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Christopher F. McKee</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Richard A. Meserve</td>
</tr>
<tr>
<td>New York, NY</td>
<td>James K. and Holly T. Mitchell</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Duncan T. Moore</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Peter B. Moore</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Joel Moses*</td>
</tr>
<tr>
<td>New York, NY</td>
<td>John H. Moxley III</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Sezaki K. Mtingwa</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Darla and George E.* Mueller</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Earl M. Murman</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Elaine Nadler</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Albert Narath</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Jaya and Venky Narayanamurti</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Philip and Sima Needleman</td>
</tr>
<tr>
<td>New York, NY</td>
<td>John Neerhout, Jr.</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Stuart O. Nelson</td>
</tr>
<tr>
<td>New York, NY</td>
<td>William D. Nix</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Elena and Stuart Nightingale</td>
</tr>
<tr>
<td>New York, NY</td>
<td>William D. Nix</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Ronald and Joan Nordgren</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Charles P. O’Brien</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Gilbert S. Omenn and Martha A. Darling</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Gordon H. Orians</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Jeremiah P. Ostriker</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Larry* and Carol Papay</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Barbara H. Partee</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Robert E. Patricelli</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Aliene and Thomas K. Perkins</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Karl S. Pister*</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Jeffrey L. Platt</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Thomas and Patty Pollard</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Deborah E. Powell</td>
</tr>
<tr>
<td>New York, NY</td>
<td>William F. Powers</td>
</tr>
<tr>
<td>New York, NY</td>
<td>William H. Press and Jeffrey Howell</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Roberta and Edwin Przybylowicz</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Roy Radner* and Charlotte Kuh</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Eli Reshotko</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Kenneth A. Ribet</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Charles C. Richardson</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Jerome G. Rivard</td>
</tr>
<tr>
<td>New York, NY</td>
<td>C. Ruth and Eugene* Roberts</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Bernard L. Robertson</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Martine F. Roussel</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Erkki Ruoslahti</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Vinod K. Sahney</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Steven B.* and Kathryn B. Sample</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Linda S. Sanford</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Maxine L. Savitz</td>
</tr>
<tr>
<td>New York, NY</td>
<td>R. Duncan* and Carolyn Scheer Luce</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Randy Schekman</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Joseph E. Scheger</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Gerold L. Schiebler</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Richard Schoen and Doris Fischer-Colbrie</td>
</tr>
<tr>
<td>New York, NY</td>
<td>William R. Schowalter</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Sara Lee and Axel Schupf</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Henry G. Schwartz</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Lyle H. Schwartz</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Mischa Schwartz</td>
</tr>
<tr>
<td>New York, NY</td>
<td>John H. Schwarz</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Robert J. Serafin</td>
</tr>
<tr>
<td>New York, NY</td>
<td>F. Stan Settles</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Iris R. Shannon</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Charles J. Sherr</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Kenneth I. Shine</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Stephen M. Shortell</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Edward H. Shortliffe</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Arnold H. Silver</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Maxine F. Singer</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Jack M. Sipress</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Harley C. and Carol H. Sox</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Patricia G. Spear</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Robert F. and Lee S. Sproull</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Georges C. St. Laurent, Jr.</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Raymond S. Stata</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Richard J. and Bobby Ann Stegemeier</td>
</tr>
</tbody>
</table>

*Deceased
2022 Honor Roll of Donors

Gunter Stein
Joan A. Steitz
Rosemary A. Stevens
Kenneth H. Stokoe
Edward C. Stone
Richard G. Strauch
Lubert and Andrea Stryer
F. William Studier
Norman Sutin*
James M. Symons
Charlotte and Morris Tanenbaum
Samuel O. Thier
James M. Tien and Ellen S. Weston
Maury Tigner
Neil E. Todreas
Alvin Trivelpiece*

Roxanne and Karl K.* Turekian
Michael S. Turner
Roy and Diana Vagelos
Charles M.* and Rebecca M. Vest
Andrew and Erna* Viterbi
Peter K. Vogt
Peter and Josephine von Hippel
Thomas H. and Dee M. Vonder Haar
Irving T. Waaland*
Robert and Robyn Wagoner
David B.* and Marvalee H. Wake
Edward E. Wallach
Steven J. Wallach
Gail L. Warden
George D. Watkins
John T. and Diane M. Watson

Sheldon Weinig
Herbert Weissbach
Jasper A. Welch, Jr.
Raymond P. White, Jr.
Robert M. White
Mavis and Robert M.* White
Ward O. Winer
Evelyn M. Witkin
Owen N. Witte
Edgar S. Woolard, Jr.
Wm. A. Wulf*
Carl Wunsch
Tachi* and Leslie Yamada
Ben T. Zinn
Michael and Leslee Zubkoff
Anonymous (2)

GREAT HALL SOCIETY (ANNUAL GIVING SOCIETY)
The Great Hall Society, the Academies’ new annual giving society, recognizes donors who make leadership-level gifts at two levels: the silver level, for annual gifts totaling $5,000–$9,999, and the gold level, for annual gifts totaling $10,000 or more. Annual funding provides resources that support ongoing activities and outreach efforts while also enabling the National Academies to respond to emerging issues facing our nation and world in a timely manner every year. We gratefully acknowledge the following members and friends who have joined this new society.

Gold Level ($10,000+)
Bruce and Betty Alberts
Betsy Ancker-Johnson*
Joan* and Edward Anders
John and Pat Anderson
John and Elizabeth Armstrong
Nadine Aubry and John L. Batton
K. Frank Austen
Wanda M. and Wade Austin
Sunanda Basu
Mark Baumgartner
Donald and Joan Beall
Gordon Bell
May R. Berenbaum
Daniel and Frances Berg
Mark T. Bohr
Daniel and Lana Branton
John and Sharon Brauman
Margaret K. Bueche*
Eugen and Cleopatra Cabuz
Charles C. Capen*
Christine K. Cassel
Chau-Chyun and Li-Li Chen
Josephine Cheng
Lili Cheng
Priscilla Chou
Ting Wu and George Church
Ralph J.* and Carol M. Cicerone
Ellen Wright Clayton and Jay Clayton
Graham A. Colditz and Patti L. Cox
Barry and Bobbi Coller
Ross and Stephanie Corotis
Pedro M. Cuatrecasas
Roy Curtiss and Josephine Clark-Curtiss
Mary Czerwinski
Ruth David and Stan Dains
Jeffrey Dean and Heidi Hopper
Pierre Deligne
Julie H. and Robert J. Desnick
Nicholas M. Donofrio
David and Miriam Donoho
Ruth and Victor Dzau
James O. Ellis, Jr. and Elisabeth Paté-Cornell
Dotty* and Gordon England
Delores M. Etter
Harvey V. Fineberg and Mary E. Wilson
Bruce and Pat Finlayson
Henry W. Foster, Ill

Efi Foufoula-Georgiou and Tryphon Georgiou
Edward H. Frank and Sarah G. Ratchye
Elena and Peter Fuentes-Afflick
Douglas W. and Margaret P. Fuerstenau
Fred H. Gage
Christopher B. Galvin
Michael P. Galvin
Yellow H. Gandhi
Louis V. Gerstner, Jr.
Sid Gilman and Carol Barbour
Roy W. Gould*
Jane Henney and Robert Graham
Paul and Judy Gray
Diane E. Griffin
Jerome H.* and Barbara N. Grossman
Willy Haeblerli
Carol K. Hall
John O. and Candace E. Hallquist
Wesley L. Harris
Joshua M. Hauser
Robert Mason Hauser
Susan and David Hibbitt
Eve Higginbotham and Frank Williams

*Deceased
2022 Honor Roll of Donors

John G. Hildebrand and Gail D. Burd
Lyda Hill
Chad and Ann Holliday
Ming and Eva Hsieh
Michael W. Hungapiller
Jennie S. Hwang
Irwin and Joan Jacobs
Kathleen Jamieson
Trina and Michael Johns
Frank and Pam Joklik
Fred Kavli*
Terri L. Kelly
Mary Anne Koda-Kimble
Kent Kresa
Patricia Kuhl and Andrew Meltzoff
Jane and Norman N. Li
Robert A. Lieberman
Frances and George Ligler
Stella and Steve Matson
Roger L. McCarthy
Eileen McCauley
John F. McDonnell
Robin K. and Rose M. McGuire
Larry V. McIntire
Andrew P. McMahon
Marcia K. McNutt
George P. Mitchell*
James K. and Holly T. Mitchell
Kelle H. Moley
Gordon and Betty Moore
Charles W. Moorman
Cherry A. Murray
Narayana and Sudha Murty
John Neerhout, Jr.
Gilbert S. Omenn and Martha A. Darling
Thomas and Jo Overbye
Larry* and Carol Papay
Cathy and Paul S.* Peercy
Fernando C. Pereira
Jonathan B. Perlin
Julia M. Phillips and John A. Connor
Percy A. and Olga A. Pierre
Dana A. Powers
James C. Puffer, M.D.
Stephen Quake
Nancy N. Rabalais
Richard F. and Terri W. Rashid
Buddy Ratner and Cheryl Cromer
Emanuel P. Rivers
C. Ruth and Eugene* Roberts
Anne K. Roby
Cathy Rogers
Christopher Rogers
Julie and Alton D. Romig, Jr.
Howie Rosen and Susan Doherty
Jonathan J. Rubinstein
William J. Rutter
Henry and Susan Samuela
John M. Samuels, Jr.
Alejandro Sanchez Alvarado
Linda S. Sanford
Charles Sawyer
Leonard D. Schaeffer
Mary Schafrik
Christine E. Seidman
Jonathan G. Seidman
Carla J. Shatz
Jacqueline and Henry Shinefield
James and Marilyn Simons
Carol H. and Harold C. Sox
Raymond S. Staia
Lisa T. Su
Thomas and Marilyn Sutton
John and Janet Swanson
Anne Swenson
Sridhar Tayur and Gunjan Kedia
Hemant K. and Suniti Thapar
Samuel O. Thier
James M. Tien and Ellen S. Weston
Holly and Jeff Ullman
Roy and Diana Vagelos
Andrew and Erna* Viterbi
Robert and Robyn Wagoner
David Walt and Michele May
Darsh T. Wasan
Irving L. Weissman
Mynra M. Weissman
Susan R. Wessler
Ronald A. Williams
Ruth Williams and Bill Helton
Ward O. and Mary Jo Winer
Yannis and Sheryl Yortsos
Elias A. Zerhouni
Jie Zhang
Charles F. Zukoski
Anonymous (2)

Silver Level ($5,000–$9,999)

Linda M. Abriola and Larry M. Albert
Darlene and John Abt
Ilesanmi and Patience Adesida
David J. Allston
Jeanne Altmann
Walter and Milly Alvarez
George Anders
Alfredo H. Ang
J. Roger P. Angel
Frances H. Arnold
Harrison H. and Catherine C.* Barrett
Jacqueline K. Barton and Peter B. Dervan
Terry and Roger N. Beachy
Rudy and Anna Bonaparte
Gopa and Arindam Bose
Corale L. Brierley
James A. Brierley
Jeanne Brooks-Gunn
Andrew and Malaney L. Brown
Martin J. Bukovac
Robert L. Byer
Hui Cao
Federico Capasso and Paola Salvini-Capasso
John Carbon and Louise Clarke
Sigrid and Vint Cerf
Selim A. Chacour
Aravinda Chakravarti
Angela Christiano
Hillary and Weston Cookler
France A. Cordova
Kay and Gary Cowger
Steven L. and Karen L. Crouch
Lance and Susan Davis
Johann Deisenhofer
Carlos M. del Rio
Ken A. Dill
Sue K. Donaldson
Bob and Ann Dynes
Abbas El Gamal
Janan and John Eppig

*Deceased
2022 Honor Roll of Donors

Robert C.* and Marilyn G. Forney

Eric R. Fossum

Katharine G. Frase and Kevin P. McAuliffe

Linda P. Fried

Carl Frieden

Gregory C. Fu

Stephen J. Galli

Alec D. Gallimore and Reates K. Curry

Patricia A. Ganz

James R. Gavin III

Julie L. Gerberding

Martin E. and Lucinda Glicksman

Gary J. Goldberg

Joseph W. Goodman

Gary Gottlieb and Derri Shtasel

Eliyahou Harari

Arthur F. Hebard

Janet G. Hering

Betsy L. Humphreys

Anthony A. James and Cynthia K. French

Michael R. Johnson

Paul and Julie Kaminski

Diana S. and Michael D. King

Joanne Knopoff

Rebecca Koskela

Wook Hyun Kwon

David C. Larbalestier

Guru Madhavan and Ramya Ramaswami

Kelsey C. Martin

John S. Mayo

Kiran Mazumdar-Shaw

Michael and Pat McGinnis

Elizabeth A. McGlynn

Richard A. Meserve

Nancy A. Moran and Howard Ochman

Jan and E. Phillip* Muntz

Catherine J. Murphy

Michael A. Mussallem

Jaya and Venky Narayanamurti

Philip and Sima Needleman

Ronald and Joan Nordgren

Matt O’Donnell

Susan and Franklin M. Orr, Jr.

Roberto Padovani

William H. Press and Jeffrey Howell

Wanda K. Reder

John F. and Diane Reid

Charles M. Rice III

Lynn Riddiford and James Truman

Ronald S. Robinson

Judith Rodin

Mary Ann and Thomas Romesser

Maxine L. Savitz

Amarpreet S. Sawhney

Donna and Jan Schilling

Fred B. Schneider and Mimi Bussan

Lyle H. Schwartz

Larry J. Shapiro and Ka Yan

Heung-Yeung (Harry) Shum

John Brooks Slaughter

David B. and Virginia H. Spencer

Robert F. and Lee S. Sproull

Georges C. St. Laurent, Jr.

David K. Stevenson

John D. Stobo

F. William Studier

Virginia and Carl Sulzberger

Gaye and Alan Taub

Matthew V. Tirrell

FOUNDATIONS, CORPORATIONS, AND OTHER ORGANIZATIONS

In recognition of foundations, corporations, or other organizations that made gifts or grants of $5,000+ to support the National Academy of Engineering in 2022.

A. James Clark and Alice B. Clark Foundation

Amgen, Inc.

Biocon Limited

Bristol-Myers Squibb Foundation

Charities Aid Foundation of America

Chevron Corporation

Cummins, Inc.

Forney Family Foundation

GE Foundation

The Gordon and Betty Moore Foundation

The Grainger Foundation

Grants Foundation

Grid-X Partners

Henry M. Rowan Family Foundation, Inc.

Hopper-Dean Foundation

Hsieh Family Foundation

Minneapolis Foundation

The Ohio University Foundation

Oracle Corporation

Orange County Community Foundation

Philanthropic Ventures Foundation

RAGS Charitable Foundation

Robert W. Galvin Foundation

Rogers Family Foundation

Samueli Foundation

Stevens Institute of Technology

W.M. Keck Foundation

Zerhouni Family Charitable Foundation,

We have made every effort to list donors accurately and according to their wishes. If we have made an error, please accept our apologies and contact the Office of Development at 202.334.2431 or giving@nae.edu so we can correct our records.

*Deceased
### Shuttle Bus Service

**Saturday, September 30**
- Departs at 6:45 a.m. and every 15 minutes, last bus departs at 8:45 a.m.
- Departs at 9:00 a.m. as directed, last bus departs JW Marriott at 12:30 p.m.
- Departs at 1:00 p.m. as directed, last bus departs at 3:15 p.m.
- Departs at 3:30 p.m. as directed, last bus departs at 5:30 p.m.
- Departs at 5:30 p.m. as directed, last bus departs at 6:15 p.m.
- Departs at 9:30 p.m. as directed, last bus departs at 10:15 p.m.

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>JW Marriott</td>
<td>Keck Center</td>
</tr>
<tr>
<td>JW Marriott</td>
<td>NAS Building</td>
</tr>
<tr>
<td>NAS Building</td>
<td>JW Marriott</td>
</tr>
<tr>
<td>NAS Building</td>
<td>JW Marriott</td>
</tr>
<tr>
<td>Keck Building</td>
<td>JW Marriott</td>
</tr>
<tr>
<td>JW Marriott</td>
<td>National Cathedral</td>
</tr>
<tr>
<td>National Cathedral</td>
<td>JW Marriott</td>
</tr>
</tbody>
</table>

**Sunday, October 1**
- Departs at 9:45 a.m. as directed, last bus departs NAS Building at 6:45 p.m.
- Departs at 9:30 p.m. as directed, last bus departs at 9:45 p.m. (Golden Bridge)

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>JW Marriott</td>
<td>NAS Building</td>
</tr>
<tr>
<td>NAS Building</td>
<td>JW Marriott</td>
</tr>
<tr>
<td>NAS Building</td>
<td>JW Marriott</td>
</tr>
</tbody>
</table>

**Monday, October 2**
- Departs at 6:45 a.m. as directed, last bus departs at 12:30 p.m.
- Departs at 1:15 p.m. and every 15 minutes, last bus departs at 1:45 p.m.
- Departs at 4:00 p.m. and every 15 minutes, last bus departs at 5:30 p.m.
- Departs at 4:00 p.m. and every 15 minutes, last bus departs at 5:30 p.m.

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>JW Marriott</td>
<td>NAS Building</td>
</tr>
<tr>
<td>NAS Building</td>
<td>Keck Center</td>
</tr>
<tr>
<td>NAS Building</td>
<td>JW Marriott</td>
</tr>
<tr>
<td>Keck Center</td>
<td>JW Marriott</td>
</tr>
</tbody>
</table>

### Guest Tour Transportation

**Monday, October 2**
- Departs at 9:45 a.m.
- Departs at 9:45 a.m.
- Departs at 11:45 a.m.
- Departs at 11:45 a.m.
- Departs at 1:45 p.m.

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS Building</td>
<td>Hirshhorn Museum</td>
</tr>
<tr>
<td>NAS Building</td>
<td>Kennedy Center</td>
</tr>
<tr>
<td>Kennedy Center</td>
<td>The Capital Grille</td>
</tr>
<tr>
<td>Hirshhorn Museum</td>
<td>The Capital Grille</td>
</tr>
<tr>
<td>The Capital Grille</td>
<td>JW Marriott/NAS Building</td>
</tr>
</tbody>
</table>

### Locations and Pick-up/Drop-off points:

- **The National Academies (NAS Building)**
  2101 Constitution Avenue, NW
  Washington, DC 20418

- **The National Academies (Keck Center)**
  500 Fifth Street, NW
  Washington, DC 20001

- **The National Cathedral**
  3101 Wisconsin Avenue, NW
  Washington, DC 20016

- **The Hirshhorn Museum**
  Independence Avenue, SW & 7th Street, SW
  Washington, DC 20560

- **John F. Kennedy Center for the Performing Arts**
  2700 F Street, NW
  Washington, DC 20566

- **The Capital Grille**
  601 Pennsylvania Avenue, NW
  Washington, DC 20004
At last year's Annual Meeting, the National Academy of Engineering (NAE) launched a landmark $100 million fundraising effort with the Campaign for Leadership in a World of Accelerating Change.

As the NAE prepares to celebrate six decades of excellence, innovation, and progress next year, we invite you to be a part of the journey through four new giving challenges.

- 60 New Curie, Franklin, or Lincoln Society Members
- 60 New Named or Endowed Funds
- 60 Planned Gifts
- 60% Participation Rate

These challenges are not just about giving; they're about leaving an indelible mark on the future as we pave the way for the next 60 years of transformative change through the Campaign for Leadership in a World of Accelerating Change.

Learn more at www.nae.edu/acceleratingchange.
### Saturday, September 30

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00–11:30 am</td>
<td>New Member Orientation</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>11:30 am–1:00 pm</td>
<td>Lunch - Council &amp; New Members</td>
<td>West Lawn</td>
</tr>
<tr>
<td>1:00–3:00 pm</td>
<td>The Big Picture: Program and Activity Expo</td>
<td>Great Hall and West Court</td>
</tr>
<tr>
<td>6:00–9:30 pm</td>
<td>New Member Reception and Dinner</td>
<td>National Cathedral</td>
</tr>
</tbody>
</table>

### Sunday, October 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am–2:00 pm</td>
<td>Registration</td>
<td>NAS 120</td>
</tr>
<tr>
<td>10:00–11:45 am</td>
<td>Brunch</td>
<td>West Lawn</td>
</tr>
<tr>
<td>10:00–11:30 am</td>
<td>URMNAE Business Meeting and Brunch</td>
<td>Lecture Room &amp; East Court</td>
</tr>
<tr>
<td>10:00–11:30 am</td>
<td>Planned Giving Seminar and Brunch</td>
<td>Members’ Room</td>
</tr>
<tr>
<td>11:45 am–1:15 pm</td>
<td>Class of 2023 Induction</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>1:15–2:00 pm</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>2:00–3:15 pm</td>
<td>Special Lecture on Engineering and Society</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>3:15–4:00 pm</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>4:00–5:30 pm</td>
<td>Celebration of Life for Wm. A. &quot;Bill&quot; Wulf</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>5:30–6:30 pm</td>
<td>Reception</td>
<td>West Lawn</td>
</tr>
<tr>
<td>6:30–9:30 pm</td>
<td>Golden Bridge Society Dinner <em>(invite only)</em></td>
<td>Great Hall</td>
</tr>
<tr>
<td>6:30–9:30 pm</td>
<td>Section Dinners/Reception <em>(if your section is hosting event)</em></td>
<td>Off Site</td>
</tr>
</tbody>
</table>

### Monday, October 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am–2:00 pm</td>
<td>Registration</td>
<td>NAS 120</td>
</tr>
<tr>
<td>7:15–8:15 am</td>
<td>International Secretary's Meeting/Breakfast <em>(invite only)</em></td>
<td>Members’ Room</td>
</tr>
<tr>
<td>7:15–8:15 am</td>
<td>Continental Breakfast</td>
<td>West Lawn</td>
</tr>
<tr>
<td>8:15–9:00 am</td>
<td>Plenary Speaker</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>9:00–9:45 am</td>
<td>Awards Presentation</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>9:15 am–2:00 pm</td>
<td>Guest Tours – Kennedy Center &amp; Hirschhorn Museum</td>
<td>NAS Great Hall</td>
</tr>
<tr>
<td>9:45–10:30 am</td>
<td>Break</td>
<td>West Lawn</td>
</tr>
<tr>
<td>10:30 am–12:30 pm</td>
<td>Forum - Engineering the Future for Sustainability</td>
<td>Kavli Auditorium</td>
</tr>
<tr>
<td>12:30–1:30 pm</td>
<td>Lunch</td>
<td>West Lawn</td>
</tr>
<tr>
<td>12:30–1:30 pm</td>
<td>Women of the NAE Meeting and Lunch</td>
<td>Lecture Room &amp; East Court</td>
</tr>
<tr>
<td>2:00–5:00 pm</td>
<td>Section Meetings</td>
<td>NAS &amp; Keck</td>
</tr>
<tr>
<td>7:30–midnight</td>
<td>Reception and Dinner Dance</td>
<td>JW Marriott Grand Ballroom</td>
</tr>
</tbody>
</table>