NATIONAL ACADEMIES Sciences Engineering Medicine

Exploring and Mapping the System of Undergraduate STEM Education
Roundtable on Systemic Change in Undergraduate STEM Education

Board on Science Education
Division of Behavioral and Social Sciences and Education

Speaker Biographies

ANN E. AUSTIN (Co-Chair) is the interim associate provost and associate vice president for faculty and academic staff affairs at Michigan State University, where she has been on the faculty since 1991. Within the College of Education, Dr. Austin previously served as the associate dean for research (2016-2021), the interim dean (2021-2022), and as a professor of higher, adult, and lifelong education at Michigan State, and served as a program director for the National Science Foundation. Her research concerns organizational change in higher education, faculty careers and professional development, teaching and learning in higher education, the academic workplace, doctoral education, and reform in science, engineering, and mathematics (STEM) education. She is a fellow of the American Educational Research Association (AERA), and she has been a council member for AERA. She is a past-president of the Association for the Study of Higher Education (ASHE), and she was a Fulbright Fellow in South Africa (1998). She earned a B.A in history from Bates College, an M.S. in higher/post-secondary education from Syracuse University, a M.A. in American culture from the University of Michigan, and a Ph.D. in higher education from the University of Michigan.

MARK MITSUI (Co-Chair) is the former president of Portland Community College in Portland, Oregon, having retired in July 2022. Before joining PCC, he served as president of North Seattle College in Washington State, Vice President of Student Services at South Seattle College, and Deputy Assistant Secretary for Community Colleges within the Office of Career, Technical, and Adult Education for the U.S. Department of Education. In Washington D.C., he worked to advance President Obama's community college agenda through partnerships with numerous federal agencies and national stakeholders. Mitsui also served on the US Interagency Working Group on Undergraduate STEM, co-chaired by the NSF and DOE, participated in a 2016 NASEM Panel on Online Education, and engaged in undergraduate metabolic research in exercise physiology and cardiac rehabilitation. He holds a Bachelor's degree in Physical Education from Western Washington University and a Master's of Education in Educational Leadership and Policy Studies from the University of Washington.

PANEL 1: PROFESSIONAL SOCIETY PERSPECTIVES

HARRIET B. NEMBHARD (Moderator, Roundtable Member) is dean of the College of Engineering at the University of Iowa and holds the Roy J. Carver Professorship in Engineering. As dean, Nembhard is the college's chief executive officer, providing strategic vision and oversight for its academic programs, research initiatives, and administrative infrastructure.

Prior to this appointment, she has held academic leadership positions at Oregon State University and Penn State University. Her scholarship in the areas of manufacturing and healthcare systems engineering has been recognized by election as a Fellow of the Institute of Industrial and Systems Engineers (IISE), a Fellow of the American Society for Quality (ASQ), and a Fellow of the American Institute for Medical and Biological Engineering (AIMBE). Throughout her career, she has advanced a community of inclusive excellence where diversity, equity, and opportunity create a welcoming environment that enables everyone to flourish. She has led and participated in efforts in this regard across the academy and professional societies including NSF ADVANCE, NSF LATTICE, NSF TECAID, National Academy of Engineering, and Society of Women Engineers. She earned her PhD and MS in industrial and operations engineering from the University of Michigan, BSE in industrial engineering from Arizona State University, and BA in management from Claremont McKenna College.

STEFANO BERTUZZI is the Chief Executive Officer of the American Society for Microbiology (ASM). ASM is one of the largest life science professional societies in the world with over 30,000 members and activities in 122 countries. Its mission is to promote and advance microbial sciences. Stefano was a senior scientific executive at the National Institutes of Health (NIH) in the Office of the NIH Director, where he advised Dr. Elias Zerhouni on a wide range of science policy matters. He also worked with the Obama White House to develop an information system to capture benefits of scientific investments. Most recently, Stefano has led ASM's efforts to address the SARS-CoV-2 pandemic. This included working directly with Ambassador Deborah Birx and the Trump White House COVID-19 Task Force, and working with the Food and Drug Administration (FDA) to increase access to diagnostic testing supplies and addressing roadblocks to coronavirus testing.

LATRESE GARRISON is the Chief Operating Officer of the American Chemical Society, received her BS in chemistry from Howard University and completed her MBA degree at Strayer University where her research focused on succession planning for the non-profit organization. She received her certificate in diversity and inclusion from Cornell University. She joined ACS in 1992 as a Program Assistant for Chemical & Engineering News magazine. In 1996 she moved to the Education Division where she held several positions including Senior Program Manager of Undergraduate Programs. In 2005 Ms. Garrison was appointed to the position of Special Assistant to the Director of the Education Division. She previously served as the Assistant Director of the Member Communities/ Department of Volunteer Support and Director of the Administrative and Programmatic Technology group and the Professional Advancement Team. LaTrease was the Executive Vice President for Education from 2016—2020 and Executive Vice President for ACS Education, Membership and Scientific Advancement from 2020-2022. She has served as staff liaison to various ACS Committees and Task Forces and is a trained facilitator for courses within the ACS Leadership Development System. In her current role LaTrease provides strategic direction and oversight for the Human Resources function; the Office of Philanthropy; ACS Membership; ACS Education; and ACS Scientific Advancement. LaTrease is a Co-Principal Investigator, NSF INCLUDES Alliance: Inclusive Graduate Education Network (NSF 1834545) where the ACS Bridge Project was established to increase the number of underrepresented students receiving PhDs in the chemical sciences. She is a member of Alpha Kappa Alpha Sorority, Inc., the American Chemical Society, th National Organization for the

Professional Advancement of Black Chemists and Chemical Engineers and an active volunteer at her church.

KAREN SAXE has served as Associate Executive Director of the American Mathematical Society and Director of the Office of Government Relations since 2017. After 28 years of working with fantastic colleagues and amazing students at Macalester College in St Paul, Minnesota, DeWitt Wallace Professor Emerita Karen Saxe accepted an opportunity to serve the larger mathematics and higher education community. At Macalester, she helped grow the Department of Mathematics, Statistics and Computer Science significantly including by hiring several new faculty members in diverse mathematical sciences fields and was instrumental in launching a Statistics Major and a Data Science Minor. In her current role, she represents the 30,000 AMS members in science policy discussions at the federal level and connects the math community to decision-makers in Washington, DC. Her work includes organizing briefings in Congress, which illustrate how federal investment in basic research in math and science pays off for American taxpayers and helps the nation remain a world leader in innovation. She continues to take joy in mentoring students and early-career mathematicians, in part through her work running DC-based fellowship opportunities to improve public understanding of science and technology. Karen earned her Ph.D. in 1988 at the University of Oregon, working in functional analysis. Her later research focused on redistricting. She is proud to have been awarded an Honorary Doctorate from her undergraduate alma mater Bard College. Karen serves on the board of Transforming Post-Secondary Education in Mathematics. She has been a Vice President of the Mathematical Association of America and is author of their *Common Vision* report. She served as an AAAS Congressional Fellow during 2013-14, working in the Senate.

PANEL 2: CREATING BETTER POSTSECONDARY STEM LEARNING ENVIRONMENTS

ANDREA FOLLMER (GREENHOOT) (Moderator, Roundtable Member) is Professor of Psychology, Director of the Center for Teaching Excellence and Gautt Teaching Scholar at the University of Kansas. She also directs the Bay View Alliance (BVA), a consortium of research universities that are studying strategies to promote widespread adoption of evidence-based pedagogy in higher education. Her research focuses on memory and cognitive development and on strategies for advancing transformed teaching and learning, informed by cognitive and developmental science. She is principle investigator of TRESTLE, an NSF-supported BVA collaboration exploring department-embedded expertise and community building as mechanisms for transforming STEM teaching and learning. She also co-leads TEval, another NSF-funded collaboration that aims to transform the evaluation of teaching in higher education. Dr. Follmer Greenhoot was on the executive committee of the Developmental Psychology division of the American Psychological Association for six years, and has consulted on legal cases involving children's memory and testimony. She received a bachelor's degree in psychology from Dartmouth College and a doctorate in psychology from the University of North Carolina at Chapel Hill. She was on the planning committee for the September 2019 NASEM Workshop on Recognizing and Evaluating Teaching and the January 2020 National Dialogue on Transforming STEM Teaching Evaluation.

KADIAN CALLAHAN is Assistant Dean for Faculty and Student Success in the College of Science and Mathematics (CSM) and Professor of Mathematics Education at Kennesaw State University (KSU). She earned a B.S. in Mathematical Sciences/Minor in Computer Information Systems from Florida A&M University - Tallahassee in 1998. Her M.S. and Ph.D. degrees are in Mathematics Education, respectively, from Indiana University - Bloomington (2002) and the University of Maryland - College Park (2006). Kadian is involved in several student success initiatives in the CSM and collaborates with faculty and administrators across KSU units and across higher educational institutions to promote continuous improvement of undergraduate Science, Technology, Engineering, and Mathematics (STEM) education. Her research examines strategies for improving teaching and learning in science and mathematics courses and programs and STEM institutional change efforts to transform teaching, learning, and the student experience. Kadian is involved with several national efforts seeking to improve undergraduate STEM education, including the *Association of Public and Land-grant Universities' (APLU's)* "Envisioning and Enacting an Inclusive and Diverse STEM Professoriate" conference series and Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL), the *Association of American Colleges & Universities (AAC&U)* Project Kaleidoscope, and the *Accelerating Systemic Change Network (ASCN)*.

JEFFREY M. OSBORN is Provost and Vice President for Academic Affairs at The College of New Jersey. His primary scientific research addresses questions about plant evolutionary biology, studying both fossil and living plants and considering evolutionary questions about pollen development, character evolution, and pollination biology in seed plants. Osborn's higher education research foci include undergraduate research, leadership of organizational and cultural change, teacher-scholar role of faculty, faculty workload models, and the integration of high-impact educational practices into the curriculum. His work has been funded by the Howard Hughes Medical Institute, National Science Foundation, J. William Fulbright Foundation, Natural Sciences and Engineering Research Council of Canada, among others sources. He has served as President of the Council on Undergraduate Research (CUR), led a number of institutional and multi-institutional programs to support the institutionalization of undergraduate research and the advancement of undergraduates and faculty who have traditionally underserved by higher education and STEM. Through these efforts, Osborn has worked with over 400 colleges and universities across the U.S. His work has been recognized by the AAAS Fellows Award, CUR Fellows Award, Centennial Award from the Botanical Society of America, and the Antarctica Service Medal of the United States of America from the National Science Foundation. Among other roles, he serves as an Associate Editor for the American Journal of Botany and on the External Advisory Committee for the State of Oklahoma's NIH-INBRE program. He holds B.S. and M.S. degrees from Texas State University and a Ph.D. from Ohio State University.

VIJI SATHY is a Professor in Psychology & Neuroscience at the University of North Carolina at Chapel Hill. She is passionate about student success, equity, and inclusion. She has published a book with her colleague Kelly Hogan, Inclusive Teaching, Strategies for Promoting Equity in the Classroom. Together they founded inclusifiED.com. They have shared their expertise with faculty through hands-on workshops at hundreds of institutions nationally and internationally. Their work has been featured in publications such as The Chronicle of Higher Education, NPR,

the New York Times and Science Magazine. Dr. Sathy is also the Associate Dean for Evaluation and Assessment and Director of the Townsend Program for Education Research in the Office of Undergraduate Education, both of which use data-driven approaches to advancing student success and the scholarship of teaching and learning. For her effectiveness in teaching large classes, she has won several teaching awards including "Best Professor at UNC" and the American Psychological Association's Society for Teaching of Psychology's Promoting Diversity, Equity, and Inclusion Award. Her research involves evaluating the impact of innovative teaching techniques and broadening participation in STEM. She directs evaluations of educational programs and curricula such as the Chancellor's Science Scholars Program. Prior to her position at UNC, she worked at the College Board conducting research on the SATs and non-cognitive predictors of college success. She completed her undergraduate and graduate degrees at the UNC-Chapel Hill (B.S. Psychology 1996; Ph.D. Psychometrics 2003). She was born in India but grew up in a small town in NC. She is a proud recipient of a K through Ph.D. public education in NC.

NANCY ZIMPHER is currently serving as Senior Fellow at the National Association of System Heads, leading the NASH Transformation Agenda called, The Power of Systems: Advancing Prosperity for the Nation. Dr. Zimpher is Chancellor Emeritus of The State University of New York (SUNY) and from 2009 to 2017, served as SUNY's twelfth chancellor, the nation's largest comprehensive system of public higher education. Prior to SUNY, she served as president of the University of Cincinnati, chancellor of the University of Wisconsin-Milwaukee, and executive dean of the Professional Colleges and dean of the College of Education at The Ohio State University. Throughout her career, Dr. Zimpher has embraced the expansive responsibilities of public higher education in the 21st century. "To educate more people and to educate them better" is at the center of her collective-impact theory of action: to drive regional and local economic development; to create seamless cradle-to-career education pipelines in every community; and systemically transform teaching and learning for students in our urban and rural school settings. Dr. Zimpher is co-founder of StriveTogether, a national network of innovative partnerships that holistically address challenges across the education pipeline, and served as chair of the National Association of System Heads, the Association of Public and Land-grant Universities, the New York Academy of Sciences, CEOs for Cities, and the Coalition of Urban Serving Universities. She is a board member of the national College Promise, co-chair of the Knight Commission on Intercollegiate Athletics, and co-director emeritus of the Association of Governing Boards' Institute for Leadership and Governance in Higher Education. Dr. Zimpher holds a BS in English Education and Speech, an MA in English Literature, and a PhD in Teacher Education and Higher Education Administration, all from The Ohio State University.

PANEL 3:THINKING BROADLY ABOUT STEM SKILLS IN THE WORKFORCE AND PREPARING STUDENTS

PATTY LOPEZ (Moderator, Roundtable Member) is currently an Intel Encore Computer Science Fellow in Residence at New Mexico State University (NMSU), where she is working to broaden participation in computing. Previously, she was as a Senior Platform Applications

Engineer within the Datacenter Platforms Group at Intel Corporation. Prior to joining Intel in 2008, she spent 19 years as an Imaging Scientist for Hewlett Packard, creating and transferring technology into imaging products. She holds seven imaging patents. She has spent over two decades as a change agent, studying, understanding, and addressing the impact of organizational culture on the recruitment, retention, and progression of women and historically excluded groups in STEM careers. She has extensive experience across all stages of the STEM pipeline, including K-12, academia, industry, and industry/government labs. Her volunteer efforts are focused on building the STEM pipeline for K-12 and beyond and creating an inclusive work culture. Among other notable national board service work with NASEM, CRA-WP, and CAHSI, she is a founding member of Latinas in Computing. A first-generation college student, she earned her BS (with honors), MS, and Ph.D. in Computer Science from NMSU.

NICK MOORE serves as the director of the Governor's Office of Education and Workforce Transformation (GOEWT) under the leadership of Alabama Governor Kay Ivey. Moore is focused on aligning Alabama's education and workforce programs, implementing Alabama's state longitudinal database system, establishing Alabama's non-degree credential quality and transparency system, and curating a competency-based education and skills-based hiring system in Alabama. Under Nick's leadership, the GOEWT is working to establish a learning and employment record, a skills-based job description generator, and a human-centered public workforce system designed to assist Alabamians with overcoming benefits cliffs and other barriers to entering the workforce.

SANJAY RAI, senior vice president for academic affairs at Montgomery College, is a champion of innovations that advance community college student success in academic, career, technical, and workforce development programs. Prior to serving as the College's chief academic officer, he served as the vice president and provost for STEM and the Germantown Campus. In that role, Dr. Rai led the creation of the Hercules Pinkney Life Sciences Park Foundation, supporting the Life Sciences Park providing an integrated academic, business, and research environment. In addition, the Paul Peck Academic and Innovation Building was completed, addressing the burgeoning life science industry with 25 start-up companies working on projects and providing learning opportunities for our faculty and students. He also led the construction of Holy Cross Hospital, the first hospital on a community college campus. He currently serves on the Montgomery County Economic Development Corporation and Maryland Tech Council, and has repeatedly been appointed to the governor's Life Sciences Advisory Board.

KIMBERLY RIEGEL (Roundtable Member) is an assistant professor in the physics department at Farmingdale State College. Prior to joining the FSC faculty, she was an assistant professor in the physics department at Queensborough Community College. She primarily studies sonic boom propagation and urban noise and its impact on communities. Before coming to Queensborough Community College she worked as an acoustical engineer in Houston, TX and New York City, working to ensure quiet communities and protecting the hearing of workers. After she completed her PhD at Penn state in acoustics working on the sonic boom propagation, she was a Consortium for Faculty Diversity Postdoctoral Fellow at Vassar College in the physics department studying the acoustical properties of fractal surfaces. She is a member of the Acoustical society of America, the American Association of Physics Teachers, a member and a

former board member of the Institute of Noise Control Engineering and a former board member of the Council for the Accreditation of Occupational Hearing Conservationists.

PANEL 4: INTEGRATING COURSE BASED UNDERGRADUATE RESEARCH EXPERIENCES INTO THE CURRICULUM - A CASE STUDY OF CHANGE IN POSTSECONDARY LEARNING AT AN HBCU

MARK LEE (MODERATOR, Roundtable Member) is an associate professor in the biology department at Spelman and is committed to STEM education for underrepresented groups, especially women scientists. He was a scientist at Emory University School of Medicine in the Winship Cancer Center (1996-1999) before joining the research faculty in the pathology and laboratory medicine department (1999-2002) where his basic science research was funded by the National Institutes of Health and the National Cancer Institute. Dr. Lee joined the Spelman biology department in 2002, and he served as chair from 2009 - 2016. In the science education community at large, Dr. Lee has collaborated with the Emory Fellowships in Research and Science Teaching (FIRST) Program, Albany State University, Michigan State University, Atlanta Public Schools, the American Association of Colleges and Universities (AAC&U), Project Kaleidoscope (PKAL), New York University Faculty Resource Network, Quality Education for Minorities (QEM) Network, Stanford Asilomar Conference for Online Education, and the National Academies Summer Institutes for Science Education. His science education research is currently funded by the National Science Foundation, and he is a member of the American Association of Physics Teachers, and the American Society for Biochemistry and Molecular Biology. Dr. Lee has a B.S. in chemistry from Morris Brown College and a Ph.D. in biochemistry from Clark Atlanta University.

CHIMDIMNMA ESIMAI is the Course-based Undergraduate Research Experience (CURE) Coordinator in the Department of Natural Sciences at Bowie State University. Dr. Esimai has participated in multiple biological and multi-disciplinary research activities and has been instrumental in fostering and nurturing vibrant research communities at the undergraduate and graduate levels. Dr. Esimai is dedicated to building sustainable STEM communities of scholarship and excellence. Dr. Esimai is also credited with going above and beyond with helping students soar within and outside the classroom, helping them chart their trajectory for future success through personal development and career mentorship. Dr. Esimai received her undergraduate degree in Engineering Sciences at Harvard University and her doctorate degree in Bioengineering at the Georgia Institute of Technology.

GEORGE UDE is a tenured full Professor in the Department of Natural Sciences at Bowie State University is the recipient of the University of Maryland's 2016 Wilson H. Elkins Professorship which honors recipients for teaching, research and service.Dr. Ude has established collaboration with internationally regarded research entities such as the DNA Learning Center at Cold Spring Harbor Laboratory, NY, the NIH, and the USDA. These efforts are geared toward diversifying the experiences of students in the STEM disciplines, and provide them opportunities to learn from world class scientists. His most recent grant received from NSF has enabled him to establish a new Applied Biotechnology Course, and also provide international research

opportunities to students. In the latter effort, Dr. Ude travels to Nigeria with several students to conduct DNA-Barcoding research, in partnership with Cold Spring Harbor and the Godfrey Okoye University at Enugu, Nigeria. The effort has led to the hosting of two international workshops on DNA barcoding in Nigeria and the US. Over the past several years, Dr. Ude has conducted the very popular Biotech Summer Institute, to provide hands on experience in molecular biology to college students, high school students, and high school teachers from various parts of the country. Testimonials from participants show that the program has enhanced the teaching and learning of biology, and aided some in gaining admission to graduate programs. His annual Biotechnology Symposium offers students the opportunity to make professional presentations to the public. Dr. Ude is the faculty coordinator of the Undergraduate Research Program at Bowie State. In 2015, Dr. Ude lead the departmental effort to host the first HBCU Course-Based Undergraduate Research Experience (CURE) at Bowie State, attended by about 40 professors from more than 20 HBCUs around the country. Another creative effort geared towards facilitating student learning of biology is the BioMusic project he initiated in 2010. The goal of the effort was to interest the youth in science by communicating in accessible format, by setting biological concepts and process to rap music.

Full Biographies for all members of the
Roundtable on Systemic Change in Undergraduate STEM Education can be found online:
https://www.nationalacademies.org/our-work/roundtable-on-systemic-change-in-undergraduate-stem-education