# AAU Undergraduate STEM Education Initiative
# Effective STEM Education:
# The Role of the Academic Department and Department Chair

**Speaker Bios**

**Michael Branicky**, Sc.D., is Professor of Electrical Engineering & Computer Science (EECS) at the University of Kansas (KU). He was KU's Dean of Engineering July 2013-June 2018. Before that he was professor and chair of EECS at Case Western Reserve University (CWRU), which he joined in 1996. Branicky received a B.S. (1987) and M.S. (1990) in Electrical Engineering & Applied Physics from CWRU and a Sc.D. in EECS from the Massachusetts Institute of Technology (1995). He was elected IEEE Fellow in 2016 for contributions to switched and hybrid control systems. Branicky also served a rotation as a program manager at the National Science Foundation from 2008-2010 and won the Director's Superior Accomplishment Award for his work on cyber-physical systems.

**Elise Covic**, Ph.D., is the Deputy Dean of the College for Academic Programs at the University of Chicago. In this capacity, Elise works jointly with the Dean, the five Collegiate Masters, and the College faculty and staff on the creation and daily management of the academic and para-curricular programs of the College. She is responsible for strategic implementation of policy developments in the College involving curriculum, student activities and College governance. She formerly served as the Dean of Students for the University of Chicago Medical Scientist Training Program (MSTP), the M.D.-Ph.D. program, where she was responsible for student advising, curricular development, admissions outreach, and for managing the administrative, budgetary, and academic affairs of the MSTP program. She received a Ph.D. in Computational Neuroscience from the University of Chicago, where she studied the synaptic properties of sensory corticocortical connections. Elise continued at Chicago as a Lecturer, Postdoctoral Scholar, and Director of the NIH Computational Neuroscience Undergraduate Summer Research Program. She was Co-Founder, Managing Director, and Science Policy and Outreach Director for the University of Chicago Biotechnology Association. She has been heavily involved in science education, outreach and advocacy initiatives, both locally, as a regular visiting scientist at various local and inner-city schools. Elise co-hosts and produces the GROKS Science Show, a science and technology radio show broadcast on over 30 stations on 3 continents. She is an active member of the Society for Neuroscience's Advocacy, Government and Public Policy network and the Coalition for Life Sciences. Through this service, she has been invited on several occasions to speak with members of Congress about science education, research and research funding.

**Andrea Follmer Greenhoot**, Ph.D., ("Dea") is Professor of Psychology, Director of the Center for Teaching Excellence and Gautt Teaching Scholar at the University of Kansas. Her research in psychology is on cognitive development and memory. Her work with the Center for Teaching

Excellence explores how we can transform learning experiences for university students that are both grounded in cognitive and developmental science and mindful of the challenges students will face in the future. Supported by grants from the Spencer, Teagle, and National Science Foundations, her work has examined strategies for enhancing learning and skill development in large courses, for assessing learning, and for using the evidence to improve education. Dea is also Associate Director of the Bay View Alliance (BVA), a consortium of research universities that are studying strategies to promote and support widespread faculty adoption of evidence-based teaching practices. A central goal of her work with the BVA is to address the many challenges associated with envisioning, designing and implementing transformed educational practices in a research university context. She is principle investigator of the TRESTLE (Transforming Education, Stimulating Teaching and Learning Excellence) project, an NSF-supported collaboration among BVA partners looking at department-embedded expertise and community building as mechanisms for promoting STEM course transformation and improved student learning. She is also leading the KU effort on a second BVA collaborative project, also funded by NSF, to transform the evaluation of teaching in higher education through the use of a multi-dimensional, multi-source framework.

**Kelly Hogan**, Ph.D., is a STEM Teaching Professor in the Department of Biology, Assistant Dean of the Office of Instructional Innovation and Director of the University's Quality Enhancement Plan associated with SACSCOC accreditation at the University of North Carolina, Chapel Hill. By demonstrating the effectiveness of her methods in large lecture classes, her work has received national attention in publications such as The New York Times, The Atlantic and Insight Diversity. Hogan works with many of Carolina's faculty to help them re-imagine their teaching and she has also shared her techniques with educators from institutions across the state and nation. Her teaching has also impacted a student audience far beyond those in her UNC-Chapel Hill classes. As the co-author of several biology textbooks (Campbell Biology's Concepts and Connections and Essential Biology), Hogan has reached hundreds of thousands of students globally. She has also been recognized by her students through nine different campus, state and national awards for teaching, mentoring and advising. Hogan was the commencement speaker for the University of North Carolina at Chapel Hill in 2015. She has been a driver of institutional reform within STEM to ensure that the gateway science courses are taught with high structure, active learning. Hogan completed her undergraduate degree in biology at The College of New Jersey in Ewing, New Jersey (B.S. 1996) and earned her doctorate from UNC-Chapel Hill (Ph.D. 2001).

**Matthew Kaplan**, Ph.D., has devoted over twenty years to the field of faculty development, primarily at the University of Michigan. Since 2015, Dr. Kaplan has served as the executive director of University of Michigan's Center for Research on Learning and Teaching (CRLT), the nation's first teaching center, where he oversees a staff of 40 as they conduct a wide array of programs to meet the needs of the university's instructional community. He runs the university's Provost's Campus Leadership Program for department chairs and associate deans, as well as the campus-wide New Faculty Orientation. Under his leadership, the center has been recognized as a key resource for faculty, chairs, and deans as they act upon initiatives launched by U-M's provost and president to expand engaged learning opportunities, reform foundational courses, and promote inclusive teaching. His co-edited book Advancing a Culture of Teaching on Campus: How a Teaching Center Can Make a Difference (2011) documents CRLT's strategic approach to the work of a teaching center. Dr. Kaplan received his Ph.D. at the University of North Carolina at Chapel Hill and worked for its Center for Teaching and Learning before joining CRLT.

**Peter Lepage**, Ph.D., is the Goldwin Smith Professor of Physics at Cornell University. His primary research area is in theoretical particle physics, for which he won the American Physical Society's J. J. Sakurai Prize in 2016. He chaired Cornell's Physics Department for four years, was then dean of its College of Arts and Sciences for ten years, and currently directs the university's Active Learning Initiative. He is a fellow of the American Academy of Arts and Sciences and was appointed to the National Science Board by President Obama in 2012. He co-chaired the PCAST STEM Undergraduate Education Working Group for the President's Council of Advisors on Science and Technology, leading to the White House publication *Engage to Excel* in 2012. The Association of American Universities (AAU) appointed him in 2011 to the Technical Advisory Committee for their Undergraduate STEM Education Initiative.

**Marco Molinaro**, Ph.D., is the Assistant Vice Provost for Educational Effectiveness at UC Davis where he created and oversees the Center for Educational Effectiveness (CEE). The CEE team is composed of highly specialized professionals focused on empowering instructors and staff, improving the educational system and fostering educational innovation and discovery all in service of removing disparities in undergraduate student outcomes while maximizing learning. Dr. Molinaro has over 22 years of educational experience creating and leading applications of technology for instruction, scientific visualization and simulation, tools for evidence-based instructional actions, curriculum development and evaluation, and science exhibits for students from elementary school through graduate school and for the general public. He is Co-PI of the Howard Hughes Medical Institute Inclusive Excellence project to ensure that all STEM students have the opportunity to pursue and excel in STEM fields through the efforts of dedicated and informed instructors utilizing evidence-based instructional practices. He serves on multiple national committees including: the APLU INCLUDES analytics committee on faculty diversification and chairs the AAAS analytics sub-committee of the SEA Change project that aims to enhance equity and diversity in university students and faculty. He also served on the National Academy of Sciences Committee on developing indicators for monitoring undergraduate STEM education. Molinaro is also the founder of the Tools for Evidence-based actions community, a group of researchers and administrators from over 100 universities dedicated to sharing tools and methodologies that encourage evidence-based instructional actions. His projects have been funded though the NSF, NIH and various private foundations such as Gates, Intel, the Helmsley Trust and HHMI.

**Erin Sanders O'Leary**, Ph.D., is an accomplished leader in the development and assessment of innovative strategies for undergraduate STEM education both in the classroom and laboratory. Dr. Sanders earned her B.S. in Chemistry from DePaul University in Chicago, IL in 1998 and her Ph.D. in Biological Chemistry from UCLA in 2005. Her research interests and experience span a variety of life sciences disciplines including molecular systematics of plastid genes in green algae, mechanisms of site-specific DNA recombination in bacteria, and composition studies of bio-energy relevant microbial communities. As a faculty member in UCLA's Department of Microbiology, Immunology, and Molecular Genetics (MIMG), Dr. Sanders pioneered the development of an innovative curriculum for MIMG undergraduates and coordinated the creation of new upper division courses that provide course-based research experiences (CUREs) and apprentice-based research experiences for all MIMG majors. Dr. Sanders is the author of a textbook for the microbiology CURE, has published on her assessment-informed curricular reform efforts, and is a recognized scholar in STEM education. As the founding director of UCLA's Center for Education Innovation and Learning in the Sciences (CEILS), Dr. Sanders works directly with faculty, university leadership, and cross-

campus units to coordinate CEILS activities to meet the needs and interests of departments and interdisciplinary programs responsible for instruction of undergraduate courses in the Life and Physical Sciences. Through these efforts, Dr. Sanders helps promote and support education and diversity initiatives that strengthen the teaching community at UCLA.

**Viji Sathy**, Ph.D., is a Teaching Associate Professor in the Department of Psychology and Neuroscience, Special Projects Assistant to the Senior Associate Dean of Undergraduate Education and Program Evaluator of the Chancellor's Science Scholars at the University of North Carolina, Chapel Hill. Sathy is actively involved in instructional innovation and assisting colleagues in promoting evidence-based educational practices. She speaks to many groups nationally on the flipped classroom in higher education. Her research involves evaluating the impact of innovative teaching techniques as well as retention in STEM courses. Sathy is also the Program Evaluator of the Chancellor's Science Scholars an adaptation of the Meyerhoff Scholarship at the University of Maryland Baltimore County that has successfully increased representation of underrepresented students in STEM Ph.Ds. She teaches quantitative courses: statistical principles in psychological research and research methods. She is the recipient of numerous teaching awards, including the Tanner Award for Excellence in Undergraduate Education and the campus' Student's choice for Best Professor at UNC. Prior to her current position at UNC, she worked at the College Board conducting research on the SATs and non-cognitive predictors of college success. Sathy completed her undergraduate degree in psychology at the University of North Carolina at Chapel Hill, NC (B.S. 1996). Based largely on the experience she had in her undergraduate statistics course, she went on to earn her doctorate in psychometrics from UNC-Chapel Hill (Ph.D. 2003).

**Brian Sato**, Ph.D., is an Associate Teaching Professor in the Department of Molecular Biology and Biochemistry at University of California, Irvine. In this role he teaches a wide variety of undergraduate courses and conducts biology education research. Dr. Sato also serves as the Interim Associate Dean for the Division of Teaching Excellence and Innovation, which is responsible for faculty and future faculty professional development as well as rigorous assessment of educational activities across campus. Most recently, he became director of the newly established UCI Education Research Initiative, whose mission is to form a network of individuals interested in conducting research on teaching and learning and implementation of this research into practice.

**Ray Vadnais** is a Senior User Experience Architect, Division of Academic Web Technologies in the Office of Information Technology at University of California, Irvine. Ray has been working in higher education IT since graduating from UCI with a B.S. in Information and Computer Science in 2005. He has led user experience design for the campus learning management systems and supporting tools for the past decade. Since 2016, as the descriptive analytics lead for Compass, he has led business analysis and reports implementation for the Compass project, which focuses on providing timely, actionable data to support student success at UCI.