ENGINEERING RESEARCH FRAMEWORK VISIONING SUMMIT

ASEE

July 16 – 18, 2019
Embassy Suites, 1900 Diagonal Rd.
Alexandria, VA 22314

TUESDAY, JULY 16, 2019

6:30 PM – 8:00 PM
VIRGINIA HALL

RECEPTION (with hors d'oeuvres)

Dawn Tilbury, Assistant Director for Engineering, NSF

WEDNESDAY, JULY 17, 2019

8:00 AM – 8:30 AM

REGISTRATION (with breakfast provided by hotel)

8:30 AM – 9:00 AM
VIRGINIA BALLROOM

OPENING SESSION

Welcome and Goals for the Day

Lance Davis, former VP for R&D, Allied Signal, Co-Chair, Summit Steering Committee

Deb Crawford, VP for Research, GMU, Co-Chair, Summit Steering Committee

Norman Fortenberry, Executive Director, ASEE

Sohi Rastegar, Chair, NSF/ENG Working Group

9:00 AM – 10:00 AM
VIRGINIA BALLROOM

NATIONAL ACADEMY OF ENGINEERING GRAND CHALLENGES FOR THE 21ST CENTURY

C.D. (Dan) Mote, Jr., Past President, National Academy of Engineering

10:00 AM – 10:15 AM

NETWORKING BREAK

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10:15 AM - 11:145 AM
VIRGINIA BALLROOM

GENERAL SESSION 1: EXISTING COMMUNITY-DRIVEN RESEARCH MODELS AND CASE STUDIES

Chair: **Deb Crawford**

THE COMPUTING COMMUNITY CONSORTIUM - *https://cra.org/ccc/about/*

Ann W. Schwartz Drobnis, Director, CCC

MFORESIGHT: ALLIANCE FOR MANUFACTURING FORESIGHT

- *http://mforesight.org/about-us/#whatwedo*

Sridhar Kota, Executive Director, MForesight

BASIC RESEARCH NEEDS WORKSHOPS

- *https://science.osti.gov/bes/Community-Resources/Reports*

Michelle Buchanan, Deputy Director for Science and Technology, ORNL

11:45 AM – 12:30 PM
VIRGINIA BALLROOM

GENERAL SESSION 2: "STAYING AT THE LEADING EDGE"

Michael Gazarik, Senior Vice President of Engineering, Ball Aerospace

Alton D. Romig, Jr., Executive Officer, NAE (former Vice President and General Manager of Lockheed Martin Aeronautics Company Advanced Development Programs - the Skunkworks®)

Lisa Teague, Head, Research and Technology, Rolls Royce

12:30 PM – 12:45 PM

Q & A FOR GENERAL SESSION 2

12:45 PM – 1:45 PM
CAPRESE ROOM

WORKING LUNCH

1:45 PM – 2:00 PM

NETWORKING BREAK & TRANSITION TO BREAKOUT ROOMS

2:00 PM – 2:45 PM
BALCONY SUITES 154, 158, CARLYLE ROOM, CARTER, KING CONFERENCE 204 AND MASON B

FACILITATED BREAKOUT SESSION 1

Chair: **Norman Fortenberry**

Informed/inspired by the morning presentations, what community-driven research models might work best for the broad engineering community? Based on what design principles?

2:45 PM – 3:00 PM

NETWORKING BREAK & RETURN TO VIRGINIA BALLROOM

3:00 PM – 3:30 PM
VIRGINIA BALLROOM

BREAKOUT SESSION 1 REPORTS

3:30 PM – 3:45 PM

NETWORKING BREAK & TRANSITION TO BREAKOUT ROOMS

3:45 PM – 4:30 PM
BALCONY SUITES 154, 158, CARLYLE ROOM, CARTER, KING CONFERENCE 204 AND MASON B

FACILITATED BREAKOUT SESSION 2

Chair: **Lance Davis**

How do we ensure the incorporation of a diversity of perspectives, including but not limited to technical, organizational and societal dimensions?

4:30 PM – 4:45 PM

NETWORKING BREAK & TRANSITION TO VIRGINIA BALLROOM

4:45 PM – 5:15 PM
VIRGINIA BALLROOM

BREAKOUT SESSION 2 REPORTS

5:15 PM – 5:30 PM
VIRGINIA BALLROOM

GENERAL SESSION 3: FINAL COMMENTS FOR DAY 1 AND CHARGE FOR DAY 2

Assignment for attendees: Based on what we've discussed and learned today, be prepared to discuss possible implementation strategies tomorrow, including operating schemes/ oversight and management approaches, and how to ensure technical breadth and inclusivity.

Sohi Rastegar, NSF

5:30 PM

ADJOURN FOR DAY

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THURSDAY, JULY 18, 2019

8:00 AM – 8:30 AM

REGISTRATION (with breakfast provided by hotel)

8:30 AM – 9:00 AM
VIRGINIA BALLROOM

GENERAL SESSION 4: SUMMARY OBSERVATIONS FROM DAY 1/CHARGE FOR DAY 2

Deb Crawford, VP for Research, GMU, Co-Chair, Summit Steering Committee

Lance Davis, former VP for R&D, Allied Signal, Co-Chair, Summit Steering Committee

9:00 AM – 9:45 AM
BALCONY SUITES 154, 158, CARLYLE ROOM, CARTER, KING CONFERENCE 204 AND MASON B

FACILITATED BREAKOUT SESSION 3

Chair: **Sohi Rastegar**

How best do we validate model(s) we've identified with the engineering community at large?

9:45 AM – 10:15 AM
VIRGINIA BALLROOM

BREAKOUT SESSION 3 REPORTS

10:15 AM – 10:30 AM

NETWORKING BREAK & TRANSITION TO BREAKOUT ROOMS

10:30 AM – 11:15 AM
BALCONY SUITES 154, 158, CARLYLE ROOM, CARTER, KING CONFERENCE 204 AND MASON B

FACILITATED BREAKOUT SESSION 4

Chair: **Deb Crawford**

How best do we pursue implementation of the model(s)?

11:15 AM – 11:30 AM

NETWORKING BREAK & RETURN TO VIRGINIA ROOM

11:30 AM – 12:00 PM
VIRGINIA BALLROOM

BREAKOUT SESSION 4 REPORTS

12:00 PM – 12:15 PM
VIRGINIA BALLROOM

CLOSING SESSION: FINAL REFLECTIONS AND NEXT STEPS

Deb Crawford, VP for Research, GMU, Co-Chair, Summit Steering Committee

Lance Davis, former VP for R&D, Allied Signal, Co-Chair, Summit Steering Committee

Sohi Rastegar, Chair, NSF/ENG Working Group

12:15 PM

ADJOURN

Box lunch served

SPEAKER BIOS

MICHELLE V. BUCHANAN

DEPUTY DIRECTOR FOR SCIENCE AND TECHNOLOGY
OAK RIDGE NATIONAL LABORATORY

As Deputy for Science and Technology, Dr. Buchanan oversees one of the nation's most extensive portfolios of research and development, spanning physical and materials sciences, energy and engineering sciences, computing and computational sciences, biological and environmental sciences, neutron sciences, and global security, for the U.S. Department of Energy and other sponsors. Before assuming her current position in October 2017, Dr. Buchanan was the Associate Laboratory Director for Physical Sciences for more than a decade. She served as director of the ORNL Chemical Sciences Division from October 2000 to November 2004 and as associate director of the ORNL Life Sciences Division from January 1999 to September 2000. She initiated the Center for Structural Molecular Biology at ORNL, serving as its director from 1999 to 2003, and led the Organic and Biological Mass Spectrometry Group in the Chemical and Analytical Sciences Division (now the Chemical Sciences Division) from 1986 to 1999. She joined ORNL in 1978 after earning a B.S. in chemistry from the University of Kansas in Lawrence, Kansas, and a Ph.D. in chemistry from the University of Wisconsin in Madison, Wisconsin.

DEBORAH (DEB) CRAWFORD

VICE PRESIDENT FOR RESEARCH
GEORGE MASON UNIVERSITY

Deborah Crawford has served as Vice President for Research at George Mason University since April 2016, and is responsible for coordinating and overseeing the full range of the university's research activities. She joined Mason from the International Computer Science Institute, an independent, non-profit research organization affiliated with the University of California Berkeley, where she served as President and Executive Director. Prior to that, she served as Senior Vice Provost for Research at Drexel University. She has worked at the National Science Foundation (NSF) in executive and program management positions in the Directorates for Computer and Information Science and Engineering, Education and Human Resources, and engineering. She also worked in the Office of the Director, while also serving as NSF's liaison to the National Science and Technology Council, the Office of Science and Technology Policy, and the National Institutes of Health.

Deborah was recognized by the President of the United States for her contributions to science and science policy, receiving a Presidential Rank Award in 2006 and in 2010.

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LANCE DAVIS

SENIOR ADVISOR
NATIONAL ACADEMY OF ENGINEERING

Lance A. Davis is Senior Advisor at the National Academy of Engineering. He previously served as Executive Officer. Under Congressional charter, the Academy provides advice to the Federal government, when requested, on matters of science and technology. As Executive Officer, Dr. Davis is the chief operating officer of the Academy, responsible for the program, financial and membership operations of the Academy, reporting to the President.

Prior to joining the Academy, Davis served as Deputy Director, Defense Research and Engineering (Laboratory Management and Technology Transition) at the Pentagon from 1994 to 1999. In this capacity, he exercised oversight responsibility for the $11B DOD laboratory system and the dual use and technology transfer activities of the DOD. He chaired the Lab Consolidation Working Group charged with restructuring the DOD lab system and the Affordability Task Force charged with balancing the cost/performance equation in Defense Science and Technology. Other major activities included the Quadrennial Defense Review, Lab Quality Improvement Program, Lab Diversification Program, Small Business Innovation Research, Industry IR&D, Manufacturing Science and Technology, and the Defense Technical Information Center.

ANN SCHWARTZ DROBNIS

DIRECTOR OF THE COMPUTING COMMUNITY CONSORTIUM
COMPUTING RESEARCH ASSOCIATION

Ann Schwartz Drobnis is the Director of the Computing Community Consortium at the Computing Research Association where she helps the computing research community to catalyze and the pursuit of innovative, high impact research by leading visioning activities for the broad community. Previously, she was a Fellow at NSF working on education and workforce development for the CISE Directorate. Prior, she taught high school computer science and math at Thomas Jefferson High School for Science and Technology.

NORMAN FORTENBERRY

EXECUTIVE DIRECTOR
AMERICAN SOCIETY FOR ENGINEERING EDUCATION

Norman L. Fortenberry is the executive director of the American Society for Engineering Education (ASEE), a global society of individual, institutional, and corporate members founded in 1893. ASEE advances innovation, excellence, and access at all levels of education for the engineering profession. ASEE is broadly concerned with instruction, research, public service, professional practice, and societal awareness. Previously, Fortenberry served as the founding Director of the Center for the Advancement of Scholarship on Engineering Education (CASEE) at the National Academy of Engineering (NAE). He served in various executive roles at the National Science Foundation (NSF) including as senior advisor to the NSF Assistant Director for Education and Human Resources and as director of the divisions of undergraduate education and human resource development. Fortenberry has also served as executive director of the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (The GEM Consortium) and as a faculty member in the department of mechanical engineering at the Florida A&M University – Florida State University College of Engineering. Dr. Fortenberry was awarded the S.B., S.M., and Sc.D. degrees (all in mechanical engineering) by the Massachusetts Institute of Technology.

MIKE GAZARIK

VICE PRESIDENT OF ENGINEERING
BALL AEROSPACE

Mike Gazarik joined Ball Aerospace in March of 2015 from NASA where he was the Associate Administrator for the Space Technology Mission Directorate at NASA headquarters. As the vice president of engineering, he provides overall strategic and operational leadership of the organization, which includes all disciplines of engineering as well as manufacturing, test, supply chain management, and facilities. Prior to this position, he served as Technical Director where he worked to align Ball's technology development with business development and growth strategies. He has over 25 years' experience in the design, development, and deployment of spaceflight systems. He has contributed to the development of technology with application to NASA's exploration, space operations and science missions. In standing up the Space Technology Mission Directorate at NASA headquarters, he led NASA's rapid development and incorporation of transformative technologies that enable the Agency's missions, and address the Nation's aerospace community's most difficult challenges. Gazarik earned a B.S. in Electrical Engineering from the University of Pittsburgh in 1987 and was a General Motors Scholar. He earned an M.S. in 1989 and a Ph.D. in 1997, both in electrical engineering, from the Georgia Institute of Technology.

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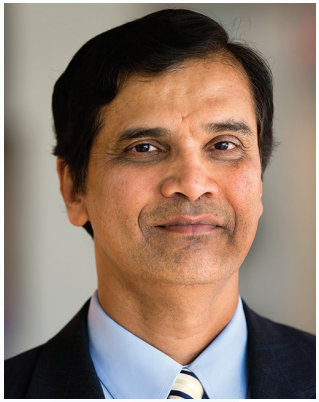
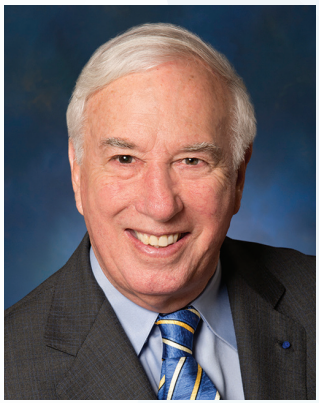


SRIDHAR KOTA

HERRICK PROFESSOR OF ENGINEERING
PROFESSOR OF MECHANICAL ENGINEERING
UNIVERSITY OF MICHIGAN

Sridhar Kota is the Herrick Professor of Engineering, Professor of Mechanical Engineering at the University of Michigan, and the founding Executive Director of MForesight: Alliance for Manufacturing Foresight, a national consortium on emerging technologies and advanced manufacturing. Between 2009-2012 Prof. Kota served as the Assistant Director for Advanced Manufacturing at the White House Office of Science and Technology Policy. He played an instrumental role in conceptualizing and championing the establishment of the national manufacturing innovation institutes. He also orchestrated implementation of the National Robotics Initiative and the National Digital Engineering and Manufacturing Initiative. Dr. Kota has authored over 200 technical papers, and has 30 patents on mechanical and bio-inspired engineering systems. He is the recipient of the American Society of Mechanical Engineers Machine Design Award, Leonardo da Vinci Award, the Outstanding Educator Award, University of Michigan Regents Award for Distinguished Public Service, and the Distinguished University Innovator Award. He is the founder and CEO of FlexSys, Inc., which developed and flight tested the world's first modern aircraft with shape-changing wings demonstrating significant reduction in noise and fuel consumption.



C. D. (DAN) MOTE, JR.

IMMEDIATE PAST PRESIDENT
NATIONAL ACADEMY OF ENGINEERING

Clayton Daniel Mote, Jr. is the immediate Past President of the National Academy of Engineering, and Regents Professor on leave from the University of Maryland where he served as its President, 1998-2010. Mote is recognized for impacts he has made as a scholar, inventor, educator, mentor, and as a leader who has advanced higher education, innovation and the engineering profession. He is the recipient of the ASME Medal, the NAE Founders Award, and the Humboldt Prize of the Federal Republic of Germany. He has authored/co-authored over 300 publications, and holds four patents. Mote is an honorary fellow of ASME, honorary member of ASEE, a fellow of: American Academy of Arts and Sciences, American Academy of Mechanics, ASA, and the American Association for the Advancement of Science. He was elected to membership in the NAE in 1988 and as President in 2013. Mote was elected to the Chinese Academy of Engineering, and as honorary academician of the Academia Sinica, Taiwan. In 2017, he was elected a Fellow of the National Academy of Inventors.

Dr. Mote is committed to ensuring highly competitive talent in the US engineering workforce, facilitating public understanding of engineering, demonstrating how engineering creates a better quality of life.

SOHI RASTEGAR

SENIOR ADVISOR AND HEAD OF THE OFFICE OF THE EMERGING FRONTIERS AND MULTIDISCIPLINARY ACTIVITIES (EFMA)
NATIONAL SCIENCE FOUNDATION

Sohi Rastegar is a Senior Advisor and the Head of the Office of Emerging Frontiers and Multidisciplinary Activities (EFMA) at the US National Science Foundation (NSF), Engineering Directorate. He joined NSF in November 2003 following fifteen years of academic and administrative service at Texas A&M University, Virginia Commonwealth University, and the Johns Hopkins University. He has been an Invited Professor at the Swiss Institute of Technology in Lausanne (EPFL), Switzerland. He earned his B.S. (Highest Honors) and M.S. in Aerospace Engineering, and his Ph.D. in Biomedical Engineering at the University of Texas at Austin. He has published over 150 scientific publications and presentations and co-founded BioTex, Inc., a medical device company based in Houston, Texas. He has been active in the American Society of Mechanical Engineers (ASME), the Optical Society of America (OSA), and a fellow of the American Institute of Medical and Biological Engineering (AIMBE). Dr. Rastegar is the recipient of awards and honors including the Select Young Faculty Award from the Texas Engineering Experiment Station and the NSF Director's Superior Accomplishment Award.

ALTON (AL) D. ROMIG, JR.

EXECUTIVE OFFICER
NATIONAL ACADEMY OF ENGINEERING

Alton D. Romig, Jr. is the executive officer of the National Academy of Engineering. Under Congressional charter, the Academy provides advice to the federal government, when requested, on matters of engineering and technology. As executive officer, Dr. Romig is the chief operating officer responsible for the program, financial, and membership operations of the Academy, reporting to the NAE president. He was previously vice president and general manager of Lockheed Martin Aeronautics Company Advanced Development Programs, better known as the Skunk Works®. He spent the majority of his career at Sandia National Laboratories, operated by the Lockheed Martin Corporation, having joined Sandia 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 graduated from Lehigh University in 1975 with a BS in Materials Science and Engineering. He received his MS and PhD in Materials Science and Engineering from Lehigh University in 1977 and 1979, respectively.

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LISA TEAGUE

HEAD RESEARCH & TECHNOLOGY
ROLLS-ROYCE INDIANAPOLIS

After obtaining bachelor's and master's degrees in Mechanical Engineering from NC State University, Lisa Teague joined Detroit Diesel Allison (now Rolls-Royce Corporation) in Indianapolis in 1983. From her first role as a stress analyst, she moved on to a variety of technical and managerial positions in Design and Project Engineering. She and her family spent 2 years in the United Kingdom on assignment with Rolls-Royce, where she performed a coordination role in Engineering. In her current role as Head, Research & Technology – Indianapolis, she is responsible for the planning and execution of Research &Technology activities in Indianapolis, coordinating with global counterparts in the UK and Germany. Through a network of technology specialists, her group matures technologies for future gas turbine engine products and services. Her group also leads coordination of university research activities, and she is also involved in STEM outreach. Lisa is a member of ASME and AIAA.

DAWN TILBURY

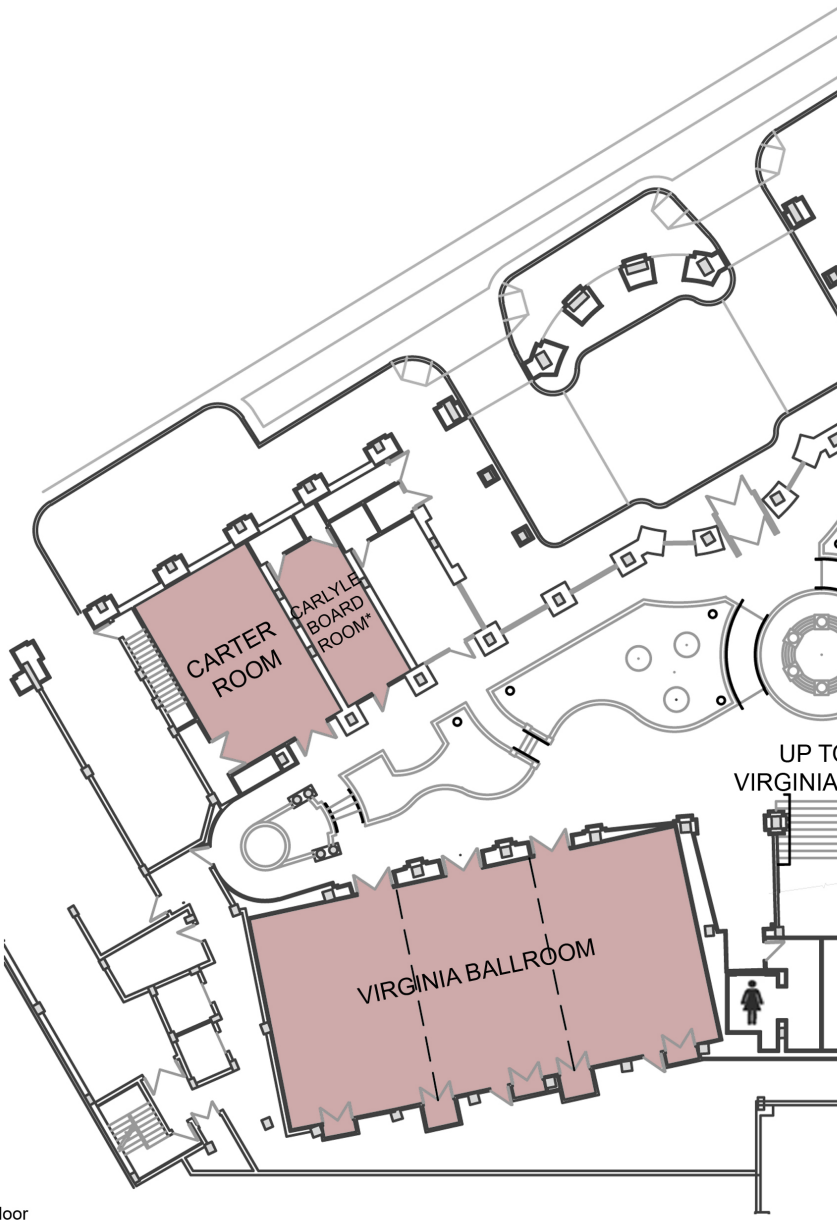
ASSISTANT DIRECTOR OF THE DIRECTORATE FOR ENGINEERING
NATIONAL SCIENCE FOUNDATION

Dawn M. Tilbury received the B.S. degree in Electrical Engineering, *summa cum laude,* from the University of Minnesota in 1989, and the M.S. and Ph.D. degrees in Electrical Engineering and Computer Sciences from the University of California, Berkeley, in 1992 and 1994, respectively. In 1995, she joined the Mechanical Engineering Department at the University of Michigan, Ann Arbor, where she is currently Professor, with a joint appointment as Professor of EECS. Her research interests lie broadly in the area of control systems, including applications to robotics and manufacturing systems. She has published more than 150 articles in refereed journals and conference proceedings. She was elected Fellow of the IEEE in 2008 and Fellow of the ASME in 2012, and is a Life Member of SWE. Since June 2017, she has been the Assistant Director for Engineering at the National Science Foundation. Dr. Tilbury leads NSF's Directorate for Engineering in its mission to support engineering research and education critical to the nation's future and foster innovations to benefit society. The Engineering Directorate provides about 32 percent of the federal funding for fundamental research in engineering at academic institutions and distributes about 1,600 research awards each year.

EMBASSY SUITES HOTEL®

Embassy Suites - Alexandria, VA

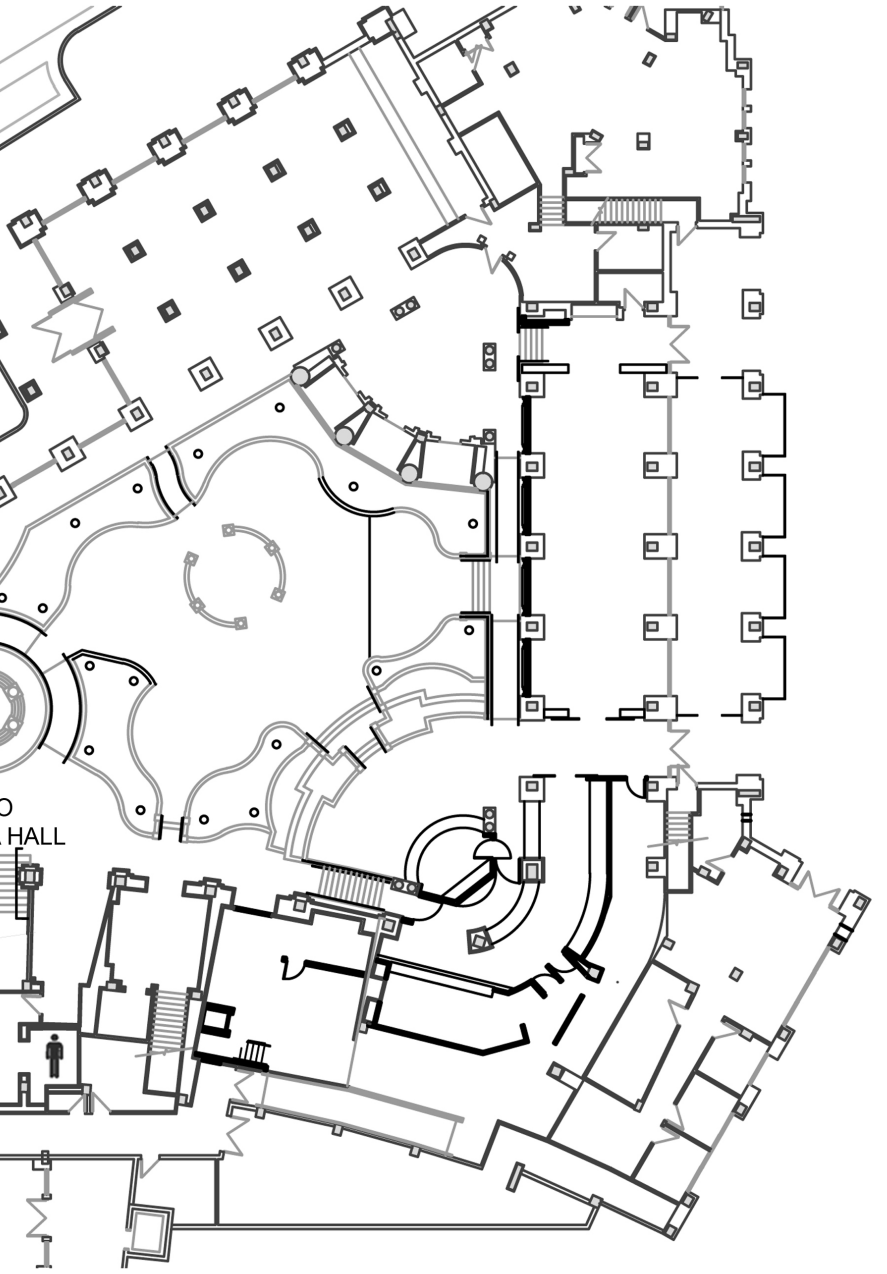
GROUP & MEETING SPACE



*Similar Board, Maymont located on 2nd floor

HOTEL MAP

LOBBY LEVEL



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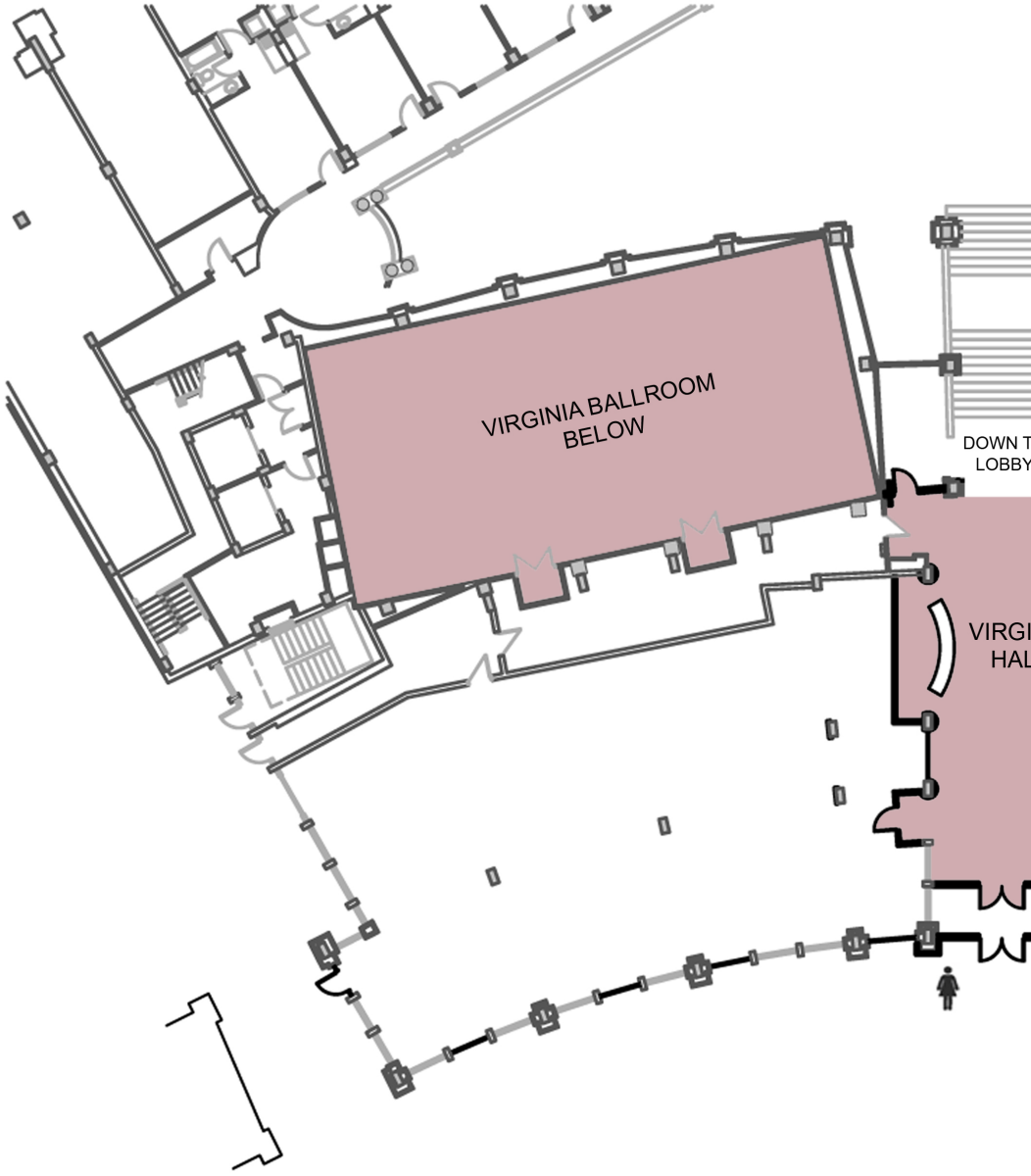
GROUP & MEETING SPACE



HOTEL MAP

MEZZANINE LEVEL

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