

Roundtable on Systemic Change in Undergraduate STEM Education

Board on Science Education

Day 1, NAS, Washington DC

MAY 23-24, 2022

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National Academies Policies and Procedures for Participation



Norms for Participation

- Embrace diversity
 - Differences in opinion are welcomed
 - Be open, listen respectfully
- Strive to promote an inclusive environment where everyone feels welcomed, valued, respected, and supported
 - Be constructive in your comments
 - Remember, bullying behavior will not be tolerated

Reminder: Policy on Preventing Discrimination, Harassment, and Bullying

- Maintain a work environment free of harassment and intimidation
- Shared responsibility not to commit harassing or discriminatory acts, not to tolerate or ignore those of others, and to avoid knowingly placing others in situations where they may be harassed
- Compliance required in all settings at the National Academies in which work is performed
- Report any incident of harassment, discrimination, or bullying to NASEM staff

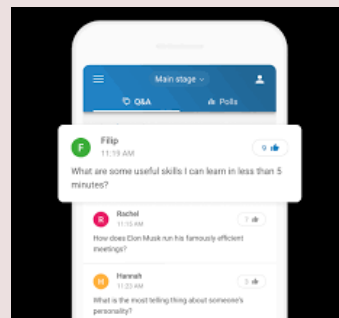
Norms for Engagement

AUDIO



Ensure you are muted
unless speaking.

SLIDO



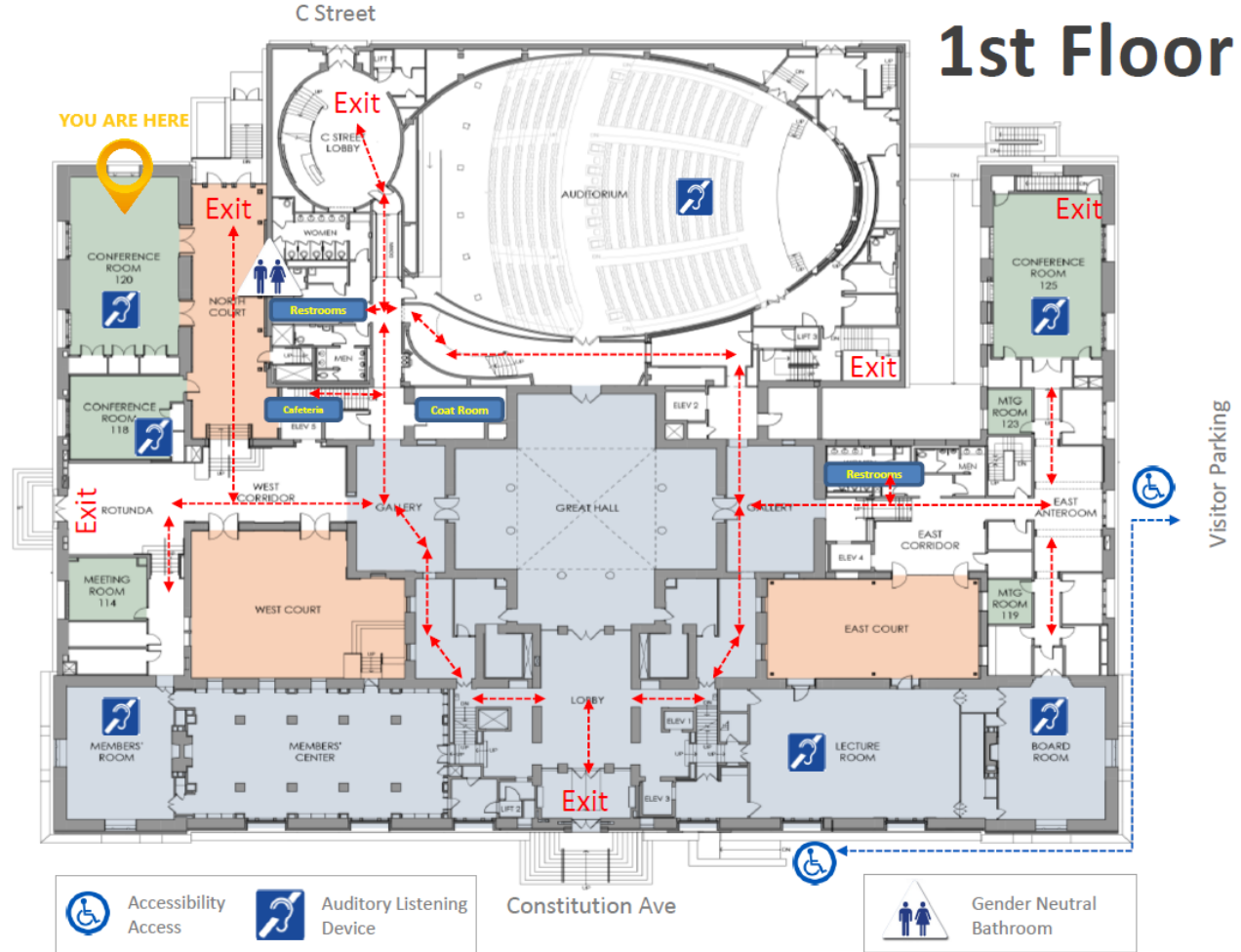
Q&A questions.

Slido

Join at
slido.com
#0540 166



NAS Building Diagram



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Overview of Roundtable on Systemic Change in Undergraduate STEM Education



Roundtable Members

Ann Austin (Co-Chair)
Mark Mitsui (Co-Chair)
Leanne Avery
Andrea Beach
Terry Brown
Marielena DeSanctis
Levon Esters
Mica Estrada
Noah Finklestein
Andrea Follmer-Greenhoot
Norman Fortenberry
Ann Gates
Howard Gobstein
Rosalyn Hobson Hargraves
Ellen Hause
Archie Holmes
Cassandra Horii
Aileen Huang-Saad
Tasha Inniss
Collins Jones
Mark Lee
Patty Lopez
Kelly Mack

Michigan State University
Portland Community College
SUNY Oneonta
Western Michigan University
American Association of State Colleges and Universities
Community College of Denver
Purdue University
University of California San Francisco
University of Colorado Boulder
University of Kansas
American Society for Engineering Education
The University of Texas at El Paso
Association of Public and Land-Grant Universities
National Science Foundation
American Association of Community Colleges
University of Texas System
Stanford University
Northeastern University
Spelman College
Montgomery College
Spelman College
New Mexico State University
American Association of Colleges and Universities

Anita Stone Marshall
Emily Miller
Susan Musante
Chandra Myrick
Harriet Nembhard
Courtney Ngai
Cordelia Ontiveros
Annette Parker
Johnny Poolaw
Linda Powell
Chris Rasmussen
Kacy Redd
Kimberly Riegel
Barbara Schaal
Eric Schulze
Susan Singer
April Strom
Kyle Swanson
Jim Swartz
Charles Sweet
Dale Winkler
Christina Yao
Lynette Yarger
Travis York

University of Florida
Association of American Universities
Howard Hughes Medical Institute
The University of Tennessee Knoxville
University of Iowa
Colorado State University
Cal Poly Pomona
South Central College
American Indian Science and Engineering Society
Community College of Philadelphia
San Diego State University
Association of Public and Land-Grant Universities
Queensborough Community College
Washington University in St. Louis
Memphis Meats
Rollins College
Chandler Gilbert Community College
Metropolitan State University
Grinnell College
Naval Academy
Southern Regional Education Board
University of South Carolina
Penn State University
American Association for the Advancement of Science

Mission

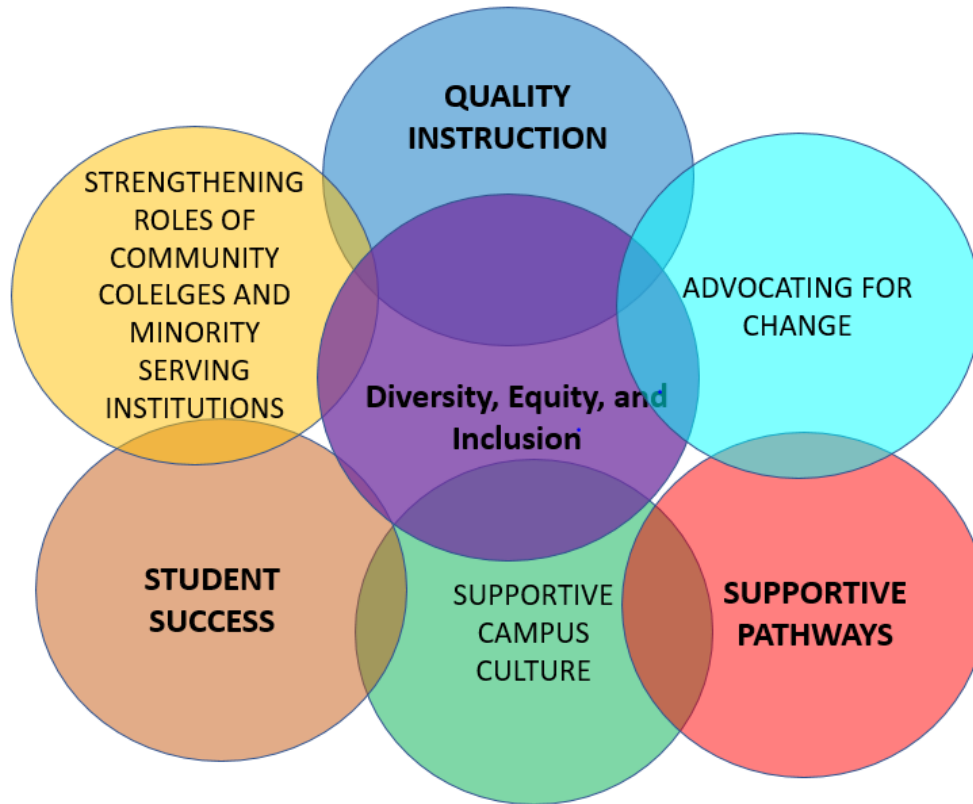
With an intentional focus on diversity, equity, and inclusion, the Roundtable on Systemic Change in Undergraduate STEM Education works to advance efforts to improve undergraduate STEM education. The Roundtable helps the field anticipate how best to serve learners in light of the rapidly changing social and economic environment, including dramatic shifts in student demographics, modes of learning, technology, STEM knowledge, commitments to equity and inclusion, and how we think about work.

- The roundtable focuses on the future of undergraduate STEM teaching and learning and helps drive a national discussion on how best to educate learners to be informed members of society and/or participate in the future STEM workforce.
- The roundtable considers the system involved in undergraduate STEM education including students, faculty, department chairs, campus leaders, campus administrators, university systems administrators, education researchers, funders, professional societies in the STEM disciplines, associations of colleges and universities, STEM employers, policy makers, influencers, and the general public.
- Roundtable work draws upon and connect existing efforts in order to help the community as a whole identify gaps and to build momentum for action by stakeholders.

Context and Challenges

- Industry & technology trends reshaping higher education (e.g. AI)
- Changing nature of work and changing role of STEM in work
- Changing demographics of students
- Changing demographics of educators
- Changing expectations of educators
- Changes to the communities in which higher education institutions are situated
- Changing relationships of institutions of higher education and their communities
- Expanding knowledge of learning processes – connecting research to pedagogy
- How to leverage small scale projects to create large scale change
- How to link and coordinate multiple actors and organizations working toward improvement
- How to respond to short-term needs and anticipate long-term changes and needs

Potential Priorities of the Roundtable



Agenda

Day 1

Connect stakeholders in education, government agencies, and professional societies to explore how the changing landscape of the workplace and the workforce has implications for reform of undergraduate STEM education.

10:00am – 4:00pm

Public Sessions

- 10:15am Future Needs for the Workforce and the Implications for Educating Undergraduates
- 11:05am Workforce Policy
- 01:00pm Partnerships between Higher Education, Industry, Government and Communities
- 02:00pm Efforts by Disciplinary Societies to Support a Diverse Workforce
- 03:00pm Commentary panel and wrap up

4:00pm – 6:00pm

Closed Session

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Panel Discussions



What are the Future Needs for the Workforce and the Implications for Educating Undergraduates

Panelists:

Maricla Pirozzi Quartey, Associate Co-op Coordinator and Director of Multidisciplinary Masters Co-op Programs, Northeastern University

William Tyson, Associate Professor, University of South Florida

Jayshree Seth, Corporate Scientist and Chief Science Advocate, 3M

Moderator:

Patty Lopez, Intel Encore Computer Science Fellow in Residence, New Mexico State University

Workforce Policy

Panelists:

Amanda Winters, Program Director, National Governors Association

Dale Winkler, Vice President, Southern Regional Education Board

Patsy Richards, Director of Long-Term CareWorks, RISE Partnership

Kenneth Gibbs, Chief of the Undergraduate and Predoctoral Cross-Disciplinary Training Branch, National Institute of General Medical Sciences

Moderator:

Mark Mitsui, President, Portland Community College

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Lunch and Networking



Lunch Session

Choose the Topic of your Interest

- **TOPIC A-Role of Government**
Mark Mitsui and Beth Cady
NAS 120 (stay in main meeting room)
- **TOPIC B-Role of Industry**
Patty Lopez and Kerry Brenner
Members Room
- **TOPIC C-Community-based and Community-relevant Initiatives related to STEM education**
Patsy Richards and Star Sharp
Right side of terrace (rain location=NAS 118)
- **TOPIC D-Share New Developments related to Institutional Initiatives in Undergraduate STEM education**
Ann Austin and Janet Gao
Left side of terrace (rain location=NAS 114)
- Quiet Room (NAS 250, 280)

Lunch & Network

We will return to the full group at
1:00 pm EDT.

Partnerships Between Higher Education, Industry, Government, and Communities

Panelists:

Celeste Carter, Lead Program Director of Advanced Technological Education Program,
Division of Undergraduate Education, National Science Foundation

Kathleen Plinske, President, Valencia Community College

Clayton Yates, Professor, Department of Biology and Center for Cancer Research,
Tuskegee University

Moderator:

Susan Singer, Vice President for Academic Affairs and Provost, Rollins College

Efforts by Disciplinary Societies to Support a Diverse Workforce

Panelists:

Pamela Padilla, President of SACNAS and Professor of Biology, University of North Texas

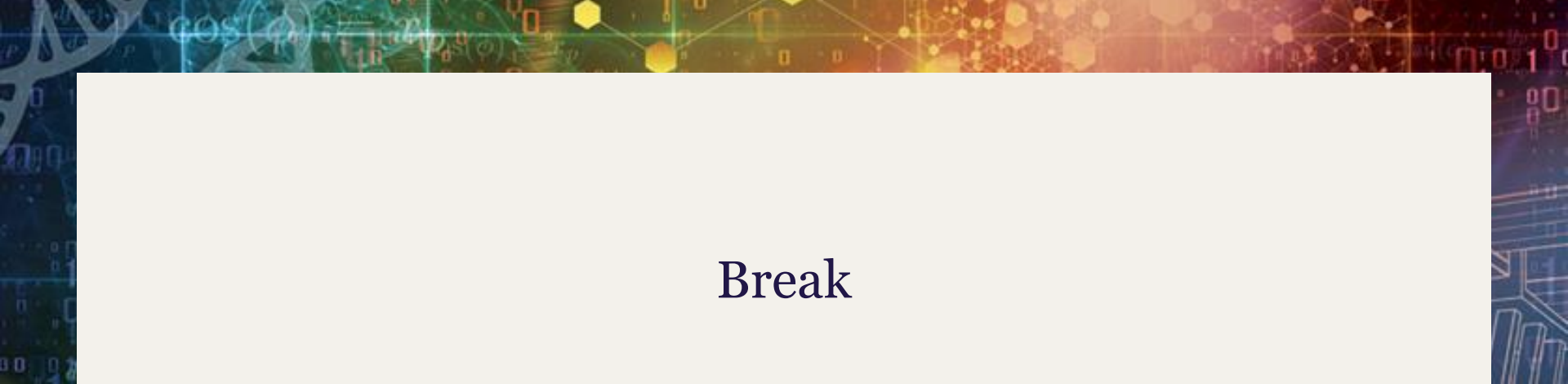
Terri Chambers, Senior Director of Education, American Chemical Society

Irene Hulede, Director of Education, American Society for Microbiology

Kathryne Woodle, Senior Program Manager, American Physical Society

Moderator:

Norman Fortenberry, Executive Director, American Society for Engineering Education

The header features a complex, colorful background with mathematical symbols like $\cos(\phi)$, $\ln$, and ψ , along with binary code (0s and 1s) and molecular structures. The colors transition from blue on the left to orange and red on the right.

Break

We will return at
3:00 pm EDT.

Commentary and Wrap-Up

Panelists:

Howard Gobstein, Senior Vice President for STEM Education and Research Policy,
Association of Public and Land-grant Universities

Harriet Nembhard, Dean and Professor, University of Iowa College of Engineering

Mark Lee, Associate Professor Biology, Spelman College

Moderator:

Ann Austin, Professor and Interim Dean, Michigan State University College of Education

Public Meeting Adjourn

Members will return at
4:00 pm EDT.

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Work Group Time



Virtual Workgroup Session

Check your email for the link that we sent.

You will be moved to appropriate break-out room for you workgroup.

When you enter the virtual room, you will receive instructions from your group's co-lead on next steps and timing.

In-person Workgroup Session

- Group 1: **Leadership** – NAS 120
- Group 2: **Culture of STEM** – Members' Room (1st Floor)
- Group 3: **Data Smart for Equity** – NAS 280
- Group 4: **Holistic Education** – NAS 250
- Group 5: **Instructional Workforce** – NAS 118
- Group 6: **Transitions and Transfer** – NAS 114

Instruction

- Ensure goals for your work group are clear (revise language in your google docs as necessary)
- In the google slide deck (link in chat), prepare one slide for your group that includes a 1-2 sentence description of your group and a 1-2 sentence description of your high level plans. This is for use tomorrow as we think about overlap and coordination between groups.
- Discuss actions necessary to make progress on your goals. Which actions have you already agreed on? Which are still to be determined?
- Save details about who will do what and when until tomorrow

Work Group Time in Break out Rooms

We will return to the full group (Room 120
or Main Zoom Room) at
5:55 pm EDT.

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Wrap up and Plans for Tomorrow



Dinner and Networking

- Find somebody new to you and discuss the most important issue related to undergraduate STEM education that you each think the Roundtable should explore in more detail.

NAS West Court

6:15pm – 8:00pm EDT

Thank you for your continued participation!!
See you all tomorrow!