

ELIZABETH H. SIMMONS
Executive Vice Chancellor, Academic Affairs
Distinguished Professor of Physics
University of California, San Diego

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Education

Ph.D., Physics (Particle Theory), Harvard University (1990).
Thesis: “Electroweak and Flavor Symmetry Breaking.”
Advisor: Prof. Howard Georgi.

A.M., Physics, Harvard University (1987).

M.Phil., Physics (Theory of Condensed Matter), University of Cambridge (1986).
Thesis: “Origins and Symmetry of Some Incommensurate Phases.”
Advisor: Prof. Volker Heine.

A.B., Physics, *magna cum laude*, Harvard University (1985).

Previous Employment

Michigan State University
Associate Provost for Faculty and Academic Staff Development (2016-17).
Dean, Lyman Briggs College (2007-17). Director, Lyman Briggs School of Science (2003-07).
Acting Dean, College of Arts & Letters (2014-15)
University Distinguished Professor (since 2013).
Professor of Physics, Dept. of Physics and Astronomy, College of Natural Science (2003-13).

Boston University
Director, BU Learning Resource Network for Pre-College Outreach (2002-03).
Associate Chair for Undergraduate Studies, Department of Physics (2001-03).
Associate Professor of Physics (1998-2003).
Assistant Professor of Physics (1993-98).

Harvard University
Postdoctoral Fellow in Theoretical Particle Physics, Department of Physics (1990–93).

Sabbatical and Visiting Positions

American Council on Education Fellow, Office of the Provost, Yale University (2013-14).
Member, Institute for Advanced Study, Princeton, NJ (2009).
Visiting Scholar, Physics Department, Harvard University (2000-02).
Bunting Fellow, Radcliffe Institute for Advanced Study, Harvard University (2000-01).

Consultant on Building Diversity in STEM

American Physical Society (2014-2017).
Fermi National Accelerator Laboratory (2015).
US. Department of Energy (2014).
Jefferson National Laboratory (2013).

Public Writing

Quora Top Writer 2017, 2016. <https://www.quora.com/profile/Elizabeth-H-Simmons>
Columnist for *Inside Higher Ed*. Career Advice: Mend the Gap. (since 2011).

Honorary Societies

Fellow, American Association for the Advancement of Science (elected 2011).
Phi Kappa Phi (elected 2011).
Fellow, American Physical Society (elected 2002).
Phi Beta Kappa (elected 1983).

Awards

Outstanding Supervisor Award, Michigan State University (2017).
Robert F. Banks Award for Institutional Leadership, Michigan State University (2013).
Women's Center of Greater Lansing Tribute to Women Award (2012).
American Physical Society CSWP Woman Physicist of the Month (February 2012).
Outstanding Referee, American Physical Society (awarded 2008).
Advanced Visiting Scholar, Tsinghua University, Beijing, China (2006-07).
ACE Michigan Distinguished Women in Higher Education Leadership Award (2005).
Committee on Institutional Cooperation Academic Leadership Program Fellow (2004-05).

Boston University Scholar/Teacher of the Year (2002).
NSF Professional Opportunities for Women in Research and Education Award (2000-02).
JSPS Invitation Fellowship for Research in Japan (1996).
DOE Outstanding Junior Investigator Award (1995-1999).
NSF Faculty Early Career Development (CAREER) Award (1995-1998).
American Association of University Women American (Curie) Fellowship (1993-94).

Superconducting Supercollider Laboratory National Research Fellowship (1990-91).
Graduate School of Arts and Sciences Merit Fellow, Harvard University (1989-90).
Robbins Prize in Physics, Harvard University (1989).
National Science Foundation Graduate Fellow (1985-89).
AT&T Bell Labs Graduate Research Program for Women Grant (1985-90).
Winston Churchill Foundation Scholar, University of Cambridge (1985-86).

Radcliffe Presidential Commendation. For outstanding contributions to Radcliffe (1985).
Joseph L. Barrett Prize. For service as a peer counselor & tutor at Harvard University (1985).
Master's Award, Dudley House, Harvard University. For service as Co-op Co-president (1985).
Radcliffe Summer Science Grants, Harvard University (1982-84).
Presidential Scholar (1981).
National Merit Scholar (1981).

ADMINISTRATION

UNIVERSITY OF CALIFORNIA, SAN DIEGO:

Executive Vice Chancellor, Academic Affairs (since 2017).

Reporting to the Chancellor, the Executive Vice Chancellor serves as the chief academic officer of the University and is responsible for policies and decisions relating to all academic programs and curriculum, and faculty appointments and performance. She is also the University's chief operating officer, the institution's second-ranking executive officer, and acts on behalf of the Chancellor in overseeing the university in his absence.

In consultation with the San Diego Division of the Academic Senate, the EVC has oversight for academic planning and programming, the development and implementation of academic policy, and the academic personnel process. The office has responsibility for General Campus academic units, on and off-campus instructional activities, and instructional support programs. The EVC and her team work to advance the goals of UC San Diego's strategic plan, which emphasizes our commitment to excellence in education, research and public service, and the pursuit of diversity, equity and inclusion.

Academic Affairs is the largest of the vice chancellor areas at UC San Diego, encompassing seven academic divisions and schools, six undergraduate colleges, the Library and University Extension. The vice chancellor area also includes Undergraduate Education, Graduate Division, and several academic support units, as well as units under the purview of the Vice Chancellors for Student Affairs and Equity, Diversity & Inclusion. Academic Affairs annually manages expenditures in excess of \$700M, 2.7M ASF of space and employs over 13,500 academic, staff and research employees. The Office of the EVC provides leadership and support to the units in Academic Affairs and is responsible for policy and procedure development, communication and implementation, resource administration, training and guidance, and professional development for administrators, faculty, and staff.

MICHIGAN STATE UNIVERSITY

Associate Provost for Faculty and Academic Staff Development (2016-17).

Created and led the Academic Advancement Network (AAN; <http://aan.msu.edu>), which supports individuals in building productive careers and promotes an inclusive, proactive culture of professional development throughout campus. The AAN works with all MSU faculty, academic staff, and academic leaders as they join the university, establish professional trajectories, and advance through stages of review, promotion, and growth. Its efforts are grounded in research and privilege innovation as a way to promote growth and development.

AAN addresses both the common issues all academics encounter and the specialized issues arising for particular disciplines, appointment types, or demographic cohorts. It is organized around four nodes spanning topics crucial in the careers of faculty and academic staff: Teaching & Learning, Research & Scholarship, Leadership, and Career Paths. The network runs programs that are best handled centrally, promotes resources offered by other internal or external organizations, and partners with campus units to launch new ventures. A set of Diversity Consultants strengthens AAN's focus on inclusion, diversity, access, and engagement, which permeates the network's activities.

Reporting to the MSU Provost, the Associate Provost's primary responsibilities included:

- Designing the structure, philosophy, and operations of the new Academic Advancement Network, building on the foundations from its predecessor, the Office for Faculty & Organizational Development.

- Recruiting and supervising a team of four Assistant Provosts, all of whom are full professors.

Recruiting and coordinating the Diversity Consultants. Managing five staff direct reports.

- Leading strategic planning and resource acquisition, allocation, and tracking for a \$900k budget.

- Sustaining signature programs, conducting needs assessments, and designing new online resources and event series aligned with the Network's mission, vision, and values.

- Meeting with the leadership teams of all major academic units, interdisciplinary centers, and governance bodies to identify stakeholders' needs and initiate active collaborations.

Dean, Lyman Briggs College (2007-17).

MSU's Lyman Briggs College (LBC; <http://www.lymanbriggs.msu.edu>) is a 4-year degree-granting residential undergraduate college devoted to studying the natural sciences in their historical, philosophical, literary and social context. Each tenure-system LBC faculty member has a 75% appointment and tenure home in LBC; to facilitate scholarship, each has a 25% joint appointment in the corresponding disciplinary department of another MSU college. Half the faculty are in STEM fields and half are in the history, philosophy, and sociology of science. Student enrollment is now 2000. The college has 60 faculty and staff, over 100 student employees, and a \$4.5M operating budget.

Reporting to the Provost and sitting on the MSU Council of Deans, the Lyman Briggs Dean serves as Chief Academic, Financial, and Advancement Officer of the College. Responsibilities include:

- Leads financial and personnel planning, and resource acquisition, allocation, and tracking.

- Supervises 12 direct reports including three associate deans, four directors, and the staff in charge of IT, Finance, HR, and Development.

- Responsible for faculty hiring, retention, professional and leadership development, annual evaluations and reappointment/tenure/promotion reviews for faculty in the sciences, mathematics, and the history, philosophy, and sociology of science.

- Facilitates academic governance within the College and participation in University governance.

- Oversees the development and assessment of courses, curricula, and teaching facilities, including biology, chemistry, and physics laboratories and active-learning spaces.

- Promotes the development of a strong college research portfolio, including special focal areas.

- Plans College-wide space utilization, acquisition, and renovations.

- Leads development, communications, and alumni relations including articulation of the College's mission, vision, values, and goals to internal and external audiences. Raised \$4M for laboratory renovations and another \$4.2M as part of the current Capital Campaign, with a focus on making high-impact active and experiential learning accessible to students from backgrounds traditionally underrepresented in STEM.

- Established collaborations with 22 other academic units (spanning the humanities, social sciences, natural sciences, and professional schools) on faculty hiring and joint appointments, curriculum, governance, grant proposals, and scholarship.

Director, Lyman Briggs School (2003-07). Reported to the Dean, College of Natural Science. Served as Academic, Financial, and Operations Officer for the School, advising the Dean on all fiscal, curricular, and personnel matters for the School. Duties were similar to those articulated above,

Accomplishments as Leader of Lyman Briggs

Significant Cross-Campus Collaborations

- With the College of Engineering, created a summer bridge program for freshmen with low math placement scores, feeding into academic-year cohort programs that boost degree attainment.
- Created MSU STEM Education Alliance with Colleges of Engineering, Natural Science, and Agriculture and Natural Resources and several campus research institutes. The Alliance won an AAU STEM Initiative grant in 2013, secured grants from the Howard Hughes Medical Institute and the Herbert & Grace Dow Foundation in 2014 and is leading campus-wide efforts to reform the teaching of STEM gateway courses.
- Sponsored the new LBC-led campus research initiative Science & Society @ State (S3). This faculty collaboration generator and seed fund program, centered in Lyman Briggs and including a dozen MSU colleges, promotes interdisciplinary scholarship and grant writing in the history, philosophy and sociology of science, STEM education research, and related fields.
- Co-sponsored a new Graduate Fellows Program on Scholarship of Undergraduate Teaching and Learning together with the Graduate School. A diverse cohort of graduate students gain experience conducting mentored research on undergraduate teaching and learning; familiarity with contemporary instruction and assessment techniques; and academic career guidance.

Creation of an Inclusive College Environment

- Helped faculty establish, assess, and refine an array of programs and practices supporting persistence and graduation by students from groups traditionally under-represented in STEM fields. Secured long-term university funding once the programs' effectiveness was established.
- Improved transparency and inclusion by revising faculty recruitment, mentoring, retention, professional development, and evaluation processes. Broadened governance participation and formed a new college Standing Committee on Inclusion. The diversity of the faculty and academic staff increased markedly and the University now cites Lyman Briggs's processes as exemplars.
- The Provost awarded the College new recurring funds in recognition of these achievements and the College won an MSU Excellence in Diversity Award in 2012.

Transition of Lyman Briggs to College Status (2005-2007)

- Proposed the restoration of College status, obtaining input and widespread support from faculty, staff, students, and alumni. Obtained approval from Academic Governance and the Board of Trustees.
- Secured resources needed for full College operations, including positions in development, student recruiting, career services, communications and information technology. Established the priorities and expectations for the new positions and hired the staff.
- Supervised teams revising academic affairs, student affairs, personnel, and financial operations.
- Led the efforts to define the College's mission and values and infuse them into College processes.
- Created College procedures for reappointment, promotion, and tenure reviews, with faculty input.
- Doubled faculty grant proposals and tripled grant funding since College status was restored. Funded research spans all faculty disciplines, including the scholarship of teaching and learning.
- Established funding and award mechanisms for undergraduate research experiences, including stipends, supplies, and conference travel support. Likewise, established support for faculty scholarship including money for pilot studies and professional travel.

25% Expansion of Lyman Briggs Enrollment (2004-2007)

- Created a multi-year plan for expanding the freshman cohort to 625 students and the total enrollment to 1800+ students, with widespread support from the faculty staff, students, and alumni.
- Secured the needed faculty and staff lines, operating funds, space, and renovation funds.
- Spearheaded a \$6M renovation of the teaching laboratories, high-tech classrooms, tutoring centers, and offices. Engaged faculty and staff in the planning process. Established continuing partnerships with Physical Plant, Residential and Hospitality Services, and MSU Development.
- Hired a diverse cohort of two dozen new faculty, spanning all College disciplines and with joint appointments in a dozen disciplinary departments across the University.
- Increased curricular emphasis on cross-disciplinary teaching, inquiry-based learning and study-abroad. Expanded the History, Philosophy, and Sociology of Science (HPS) disciplinary group, thereby improving coverage of major themes in scholarship and teaching. Recruited STEM faculty to join the HPS faculty in leading senior capstone seminars bridging the STEM and HPS curricula. Encouraged cross-disciplinary team teaching and scholarly assessment of its effectiveness.

Acting Dean, College of Arts & Letters (2014-15).

Served as Acting Dean (the college's Chief Financial, Academic, and Advancement Officer) during a transitional year while an external search for a new Dean was being undertaken. Held this position concurrently with my ongoing role as Dean of Lyman Briggs College.

The College of Arts & Letters includes 8 departments and 12 academic, centers, with 52 graduate and undergraduate majors and programs and a \$40M general funds budget. College employees include 185 tenure-system faculty, 190 other faculty and academic staff, and 60 administrative and support staff. The college has 2000 primary undergraduate majors and a similar number undertaking secondary majors or minors. The graduate programs enroll 160 fully-funded Ph.D. and MFA candidates. The College contains the 1st Year Writing Program and the general education program "Integrative Studies in Arts and Humanities" taken by all MSU undergraduates, and also stewards the campus Writing Center.

Highlights of the year included

- Established a College Inclusive Practices Committee through academic governance processes.
- Secured \$3.5M in donor funding for two endowed chairs.
- Recruited an external department chair and several academic leaders from within MSU.
- Supervised 30 direct reports including twenty chairs and directors, six assistant and associate deans, and four administrative staff.
- Oversaw more than twenty reappointment, promotion, and tenure cases.
- Negotiated the move of the Performing Arts Teaching Laboratory to a new purpose-built facility.
- Revised the graduate funding model to provide stability, incentivize best practices, and improve time to degree.

Other Leadership Roles

Chair, MSU Public Art on Campus Committee (since 2016).

MSU IT Executive Steering Committee (since 2014) and MSU IT Governance Committee (since 2017).

MSU Shared Service Delivery Pilot Steering Committee (2015-16).

MSU's campus representative to the AAU Undergraduate STEM Education Initiative (2012).

Faculty Advisory Board, MSU NSF-ADVANCE program (2008-14); Board Convenor (2011-13).
MSU Academic Human Resources Advisory Committee (2008-13).
MSU Ad Hoc Committee on Work-Life Balance (2007-10).
MSU Ad Hoc Committee on Flexibility in the Tenure Process (2006-07).
MSU grant proposal writing group: NSF Research in Disability Education (2008-10).
MSU grant proposal writing group: NSF ADVANCE (2006-08).

Chair, College of Law Dean's Search and Rating Committee (2015-16).
Chair, College of Natural Science Dean's Search and Rating Committee (2006-07).
Women's Advisory Committee to the Dean, College of Natural Science (2005-07).
Diversity Committee, National Superconducting Cyclotron Laboratory (since 2006).
Tenure and Promotion Committee, National Superconducting Cyclotron Laboratory (2008).

Oversight Committee, "STEPPS" Specialization in Science, Technology, the Environment,
and Public Policy (2003-07).
Steering Committee, Residential Semester at Kellogg Biological Station (2004-09).
Advisory Committee, World View Lecture Series at Wharton Center (2005-07).
Medical Scholars Program Advisory Committee, MSU College of Human Medicine (2003-05).

BOSTON UNIVERSITY

Major Roles and Responsibilities

Founder and Scientific Organizer, Pathways Program (1994–2003).

Each year, assembled a team of over 100 volunteers and corporate funding of over \$10,000 to support a two-day workshop that brought 400 high-school girls from 40 local schools to Boston University to learn about opportunities in science, math, and engineering.

URL: www.bu.edu/lernet/pathways

Associate Chair for Undergraduate Studies in Physics (2001-03).

Recruited additional departments to participate in the interdisciplinary physics major track.

Initial advisor for prospective students, new majors and transfer students; primary advisor for physics minors; secondary advisor for Astronomy & Physics and Philosophy & Physics majors.

Ex officio member of departmental Honors and Teaching Assignment Committees.

Director, BU Learning Resource Network (LERNET) for Pre-College Outreach (2002-03).

Planned, fundraised for, and implemented outreach programs for high- and middle-school students and teachers. Encourage additional faculty to become involved. Initiate coordination of outreach efforts among the Colleges of Allied Health Sciences, Arts & Sciences, Education, Engineering, and Medicine. URL: www.bu.edu/lernet

Member, College of Arts & Sciences Committee on Appointments, Promotion, and Tenure (2001-02).

Reviewed 19 files and made recommendations to the Dean.

Member, College of Arts & Sciences Sexual Harassment Committee (1994-2003).

Reviewed cases and made recommendations to the Dean.

Other Leadership Roles

Chair, Physics Recruiting & Outreach Committee (1997-99).

Physics Colloquium Committee (1995-98).

Physics Faculty Merit Review Committee (1998-99).

Physics Faculty Search Committees in Particle Physics and Condensed Matter Physics (1996-2000).

Physics Undergraduate Curriculum and Advising Committee (1993 - 2003).

CAS Faculty Advisor, Dean Ralph W. Taylor Academic Advising Center (2002-03).

CAS LERNet Advisory Board (1998 - 2002).

CAS Women's Studies Advisory Board (1995-2000).

University Pre-Medical Advisory Board (1996 - 2003).

University Search Committee for Dean of College of Engineering (1998-99).

University Undergraduate Research Opportunities Advisory Board (1997-2000).

GRANTS

Major Physics Research Funding

- National Science Foundation Research Grant. 5/1/15 - 4/30/18. \$510,000.
Electroweak Symmetry Breaking and Physics Beyond the Standard Model,
R.S. Chivukula (co-PI) and E.H. Simmons (co-PI).
- National Science Foundation Research Grant. 5/15/10 - 4/30/15. \$1,000,000.
QCD, Electroweak Symmetry Breaking and Physics Beyond the Standard Model,
R.S. Chivukula (co-PI) and E.H. Simmons (co-PI).
- National Science Foundation Research Grant. 11/15/04 - 10/31/10. \$720,000.
Electroweak Symmetry Breaking Beyond the Standard Model.
R.S. Chivukula (co-PI) and E.H. Simmons (co-PI).
- Department of Energy Research Grant, Task E: *Theoretical Particle Physics*. \$6,030,000.
Simmons was one of 7 Boston University Co-PIs on this grant from 2/1/95 -1/31/04.

Additional Physics Research Funding

- Radcliffe Institute for Advance Study Exploratory Seminar Grant. (2007). \$30,000.
- MSU China Development Grant (2006). \$5,000.
R.S. Chivukula (co-PI) and E.H. Simmons (co-PI).
- AAAS Women's International Scientific Collaboration Travel Grant. (2002). \$2,600.
- NSF POWRE Award. (2000-02). \$75,000.
- Radcliffe Institute for Advanced Study, Harvard University. (2000-01).
Bunting Fellowship, \$42,000.
Research Partnership Grant, \$1,400.
- JSPS Invitation Fellowship for Research in Japan. (1996). \$9,000.
- DOE Outstanding Junior Investigator Award. (1995-99). \$120,000.
- NSF Faculty Early Career Development (CAREER) Award. (1995-8). \$75,000.
- AAUW American (Curie) Fellowship. (1993-94). \$20,000.
- SSC National Research Fellowship. (1990-91). \$40,000.

Educational Research Funding

- Herbert H. and Grace C. Dow Foundation Award. 10/30/2014 – 10/31/2017. \$5,000,000.
R.S. Chivukula (co-PI), K. Renn (co-PI), E.H. Simmons (co-PI) and M. Urban-Lurain (co-PI)
Funding includes \$2,500,000 to establish an endowment for student support.
- National Science Foundation CCLI -Type 2 Grant. 6/1/2010 - 5/31/2013. \$250,000.
BRAID: Bringing Relationships Alive through Interdisciplinary Discourse.
R. Sweeder (PI), Richard Bellon (co-PI), D. Luckie (co-PI), and E.H. Simmons (co-PI)
- National Science Foundation CCLI Grant. 6/1/2007 - 5/31/2010. \$149,904.
BRAID: Bridging the Disciplines with Authentic Inquiry and Discourse.
R. Sweeder (PI), D. Luckie (co-PI), and E.H. Simmons (co-PI)

Funding for Women-in-Science and Outreach Activities

NGO funding for the Career Development Workshop for Women in Physics
at the International Centre for Theoretical Physics (ICTP), Trieste, Italy.

2017 ICTP Implementation Grant \$25,000.

2015 ICTP Implementation Grant \$25,000.

2013 ICTP Implementation Grant \$25,000.

2013 US Liaisons to the International Union of Pure and Applied Physics. \$10,000.

NSF Workshop Funding for the 2004 Workshop on Education and Outreach
at the Aspen Center for Physics, Aspen, CO. \$40,000.

Corporate Funding for Pathways Program at Boston University. (1995-2003). \$97,700.

Donors included Distrigas of MA (Cabot Corp.), Ellis L. Phillips Foundation,

EMC Corporation, GenRad Inc., Genzyme Corporation, Teradyne Inc.

Hewlett-Packard Corp./Medical Products Group, Phillips Medical Systems.

NSF Funding for ATLAS Educational Outreach at Boston University.

Subcontract: *The Quantum World of Particle Physics*. (1997). \$8,750.

Subcontract: *Exploring Particle Physics*. (1998). \$6,750.

Workshop Grants Obtained as Corporate Secretary of the Aspen Center for Physics

New Physics at the Electroweak Scale and New Signals at Hadron Colliders. (2007). \$5,000 from DOE.

Neutrinos in Physics and Astrophysics. (2007). \$5,000 from DOE.

Cosmological Probes of Baryons and Dark Matter. (2006). \$8,000 from NASA. \$5,000 from DOE.

Particle Physics at the Verge of Discovery. (2006). \$5,000 from DOE.

Spatial Effects in Signal Transduction. (2006). \$5,000 from NSF.

Planetary Formation and Detection. (2005). \$8,000 from NASA. \$3,000 from DOE.

The Highest Energy Physics. (2005). \$7,000 from DOE.

TEACHING

Research Students

Current Michigan State University doctoral student: Dennis Foren.

Michigan State University doctoral theses supervised: Pawin Ittasamai (Ph.D. 2014).

Arsham Farzinnia (Ph.D. 2012), Baradhvaj Coeleppa (Ph.D. 2009), Stefano DiChiara (Ph.D. 2009).

Boston University doctoral theses supervised: Kevin Lynch (Ph.D. 2002),

Marko Popovic (Ph.D. 2001), Yumian Su (Ph.D. 1997).

Committee member, Western Michigan University: Ramon Steven Barthelemy (Ph.D. 2014).

Visiting doctoral students supervised (staying up to one year):

Tomohiro Abe, Masafumi Kurachi, and Shinya Matsuzaki (Nagoya University, Japan),

Jing Ren (Tsinghua University, China)

Michigan State University master's theses supervised: Michael Flossdorf (M.S. 2007),

Felix Braam (M.S. 2007), Alex Blum (M.S. 2005).

Michigan State University Honors College Professorial Assistants: Anthony Incorvati (2015-16),

Kathryn Jarvis (2012-13), Drew Murray (2011-13), Alex Goodin (2010-11),

Jamie Overbeek (2008-09), Tyler Augst (2007-08), Edita Klymte (2006-07),

Garrett Warnell (2005-06), Erin Nolan (2003-04).

Boston University Undergraduate research students: Mark Stelzner (2003),

Vagish Hemmige (B.A. 2002), Jerome Jenquin (B.A. 1997), Gautam Rupak (B.A. 1995).

Course at Michigan State University

PHY 415/810: Methods of Theoretical Physics. (Fall semesters 2014-2015).

LB/PHY 415: Methods of Theoretical Physics. (Spring semesters 2005-2014).

Mathematical methods and applications to physical sciences for undergraduates (415) majoring in physics, astrophysics, or other physical sciences and for entering doctoral students (810) in physics or engineering (810). Team-taught with Prof. R.S. Chivukula.

We created this course based on a class I had taught at Boston University. We employ active and cooperative learning techniques such as weekly team-based homework workshops, group work on applications of lecture material, and analysis of demonstrations. Pedagogical techniques are updated annually based on insights from professional development seminars. Since 2007, students have created posters on scientific applications of mathematics; poster preparation involves peer critique and assessment via a standard rubric. Since 2008, written objectives for each class session (readings, concepts, skills) are provided in advance. Course resources moved online in 2009. The project rubric and revision process were honed in 2010 and workshop expectations, clarified. In 2011, concept mapping and assigned longitudinal teams were introduced. During 2012 and 2013, in-class exercises emphasizing identification of the appropriate approach to a problem were added, along with additional guidance on concept mapping. In 2014, we adapted the course to serve dual graduate and undergraduate audiences; principle enhancements were online videos reviewing introductory or advanced material and case studies for graduate and honors students.

Courses at Boston University

CC105: Core Physical Science. (Fall 2002).

Physics, astronomy and earth science for freshman not planning to major in science.

PY211: General Physics I. (Fall 1997, Fall 1998, Fall 1999, Summer 2002).

Introductory calculus-based mechanics and thermodynamics for scientists and engineers.

PY212: General Physics II. (Spring 1995, Spring 1996, Spring 1997).

Introductory calculus-based electromagnetism and optics for scientists and engineers.

PY403: Methods of Theoretical Physics. (Spring 2003).

Mathematical methods class for sophomore physics majors.

PY408: Intermediate Mechanics. (Spring 1999, Spring 2000).

Newtonian and Lagrangian mechanics for junior physics majors.

PY482: Undergraduate Seminar in Particle Physics. (Spring 2002, Spring 2003).

PY491: Undergraduate Reading Course in Particle Physics. (Fall 1993, Spring 1996).

PY531: Classical Mechanics. (Fall 1993, Fall 1994, Fall 1995, Fall 1996)

Graduate core course in Lagrangian and Hamiltonian Dynamics.

PY895/896: Graduate Seminar on Theoretical Particle Physics. (Fall and Spring 1994-1998).

Teaching Innovations at Boston University

Interactive Introductory Physics Lectures.

After attending the NSF- and AAPT-sponsored New Physics Faculty Workshop in 1996, incorporated Eric Mazur's Peer Instruction and Richard Berg's Predictive Demonstration techniques into introductory physics lectures. Colleagues in the BU Physics department followed suit and began to introduce active and cooperative teaching methods.

PY482: Undergraduate Seminar in Particle Physics.

At the request of the undergraduates, initiated this seminar on current research in particle physics. Each week, faculty discussed their work on theoretical or experimental topics.

The condensed matter faculty later began offering a similar course.

PY895/896: Graduate Seminar on Theoretical Particle Physics.

Created this practicum-based course on making effective research presentations for the doctoral students in particle theory, to prepare them for defending a thesis and presenting a job seminar. Offered a condensed version to undergraduates writing senior theses.

Experience as a Graduate and Undergraduate Teaching Assistant

Teaching Fellow: Science A-17 'The Astronomical Perspective.' (1988).

Lab Instructor: Physics 12b 'Introductory Electromagnetism.' (1987).

Lab Instructor: Physics 1b 'Principles of Physics.' (1984).

Tutor: Bureau of Study Counsel, Harvard University. (1983-89).

Tutored undergraduates in science and math; helped foreign graduate students with writing skills.

Teaching Assistant: Summer Science Program, Ojai CA. (1984, 1985).

Ran the asteroid observing program including telescope, darkroom and computer labs for this enrichment program for high-school juniors. Tutored in calculus, celestial mechanics and astronomy. Gave guest lectures on linear algebra and geometrical optics. Head T.A. in 1985.

PROFESSIONAL ACTIVITIES

Major Service to Government Agencies and Universities

External Advisory Board, NSF Physics Frontiers Center. (2011-16).

Kavli Institute for Cosmological Physics, University of Chicago, Chicago, IL.

International Advisory Committee, Center for High Energy Physics. (2008-16).

Tsinghua University, Beijing, China.

Advisory Board, NSF Directorate of Mathematical and Physical Sciences (2004-07).

The MPSAC advises the MPS Director about priorities for the national program in mathematics, chemistry, physics, and astronomy.

University Research Program Panel (2006-07).

This sub-panel of the DOE/NSF High-Energy Physics Advisory Panel is charged with evaluating university research grants program and recommending improvements.

Particle Physics Project Prioritization Panel (2003-05).

This sub-panel of the DOE/NSF High-Energy Physics Advisory Panel evaluates the merits of \sim \$50M to \$600M experimental particle physics projects and recommends their priority standing in the national high-energy physics program.

SLAC Experimental Program Advisory Committee (2003-06).

The EPAC advises the Director of the Stanford Linear Accelerator Center on the selection of facilities and experiments for this national high-energy physics laboratory.

Major Service to Professional Organizations

American Physical Society: Member (since 1987) and Fellow (since 2002); Division Councilor, Division of Particles and Fields (2018-21); Chair, Founding Committee of the APS Forum on Diversity & Inclusion (2016-17). *Ad hoc* Committee on LGBT Issues (2014-16); Nominating Committee, Division of Particles & Fields (2008); DPF Executive Committee (2002-04); DPF Subcommittee on Educational Outreach (Member, 2002-07; Chair 2002-04); J.J. Sakurai Prize Committee: (Vice-Chair, 2001; Chair, 2002)

Aspen Center for Physics: General Member (since 1994), Trustee (2000-06, 2013-17), Corporate Secretary (2004-07); Asst. Corporate Secretary (2001-03; 2007-09), Asst. Scientific Secretary (2008-09); Scientific Secretary (2009-10), Committee for Participant Diversity (Member 1996-2008; Chair, 1996-2005); Nominations and Presidential Search Committees (2012-13).

American Association for the Advancement of Science: Member (since 2007) and Fellow (since 2011); Nominations Committee, Section B (2009-11).

Association of American Colleges & Universities: Member, Board of Directors (since 2014).

Summer Science Program, Inc.: Board of Trustees (Member 2006-13; Chair 2008-11 and 2012-13). Executive Committee (since 2007). Senior Vice-President (2011-12). This non-profit organization runs summer enrichment programs in astrophysics for scientifically-talented high-school students.

Conference Organization – Physics

International Advisory Committee, KMI Workshop, Nagoya University, Japan. 2-7 December 2012.

Co-Organizer, Rencontres de Blois: Particle Physics and Cosmology, Chateau de Blois, France.

24th Rencontres: Particle Physics and Cosmology, 27 May - 1 June 2012

23rd Rencontres: Particle Physics and Cosmology, 29 May - 3 June 2011.

22nd Rencontres: First Results from the LHC, 15 - 20 July 2010.

Organizer, Radcliffe Institute for Advance Study Exploratory Seminar.

Higgsless Models of Dynamical Symmetry Breaking. 31 July - 4 August 2007.

Co-organizer, Thinkshops on Top Quark Physics at Tevatron Run II.

Fermilab, Batavia, IL, 16 – 18 October 1998 and 10 – 12 November 2000.

Co-organizer, Physics Workshops at the Aspen Center for Physics.

The Flavor and Gauge Hierarchy Problems, 24 June – 21 July 1996.

Theoretical and Experimental Issues in Electroweak Dynamics. 13 July – 9 August 1998.

New Data from the Energy Frontier, 12 - 18 February 2011.

International Advisory Committee, Topical Conference Series on Hadron Collider Physics

International Advisory Committee, Aspen Winter 2003 Conference on Particle Physics

Program Committee, Annual Meeting, APS Division of Particles Fields, 4-8 April, 2003.

Conference Organization – Education & Faculty Development

Co-Organizer, Career Development Workshops for Women in Physics, International Center for Theoretical Physics, Trieste, Italy.

Third workshop: to be held 9-13 October 2017.

Second workshop: 10-16 October 2015.

First workshop: 16-19 September 2013.

Co-Organizer, Workshops on Faculty Leadership and Academic Life.

Academic Finance for Faculty Leaders, Michigan State University, 8 November 2012.

Transitioning from Faculty to Administrative Roles, Michigan State University, 29 March 2012.

Co-organizer and Moderator, Panel Sessions on Faculty Mentoring.

Evaluation of Mentoring Programs, Michigan State University, 17 April 2012.

Mentoring for Faculty Leaders, Michigan State University, 10 November 2011.

MSU Spring Institute on Teaching and Learning, 20 May 2010.

Organizer, Panel Session on Educational Outreach in the Classroom

Fermilab Users' Executive Committee Outreach Workshop, Fermilab, Batavia, IL, 5 June 2007.

Co-organizer, Parallel Session on Education and Outreach.

Joint Meeting of the American and Japan Physical Societies, Honolulu, Hawaii 30 October 2006.

Co-organizer, Workshop on Education and Outreach.

Aspen Center for Physics, Aspen, Colorado, 28 June – 11 July 2004.

Co-organizer, Focal Week on Women in Physics, Aspen Center for Physics, 4 – 10 July 1994.

Other Activities

US Department of Energy Review Panel, Graduate Fellowship Program. (2010).

University of Chicago Review Committee for High-Energy Physics at Argonne National Lab. (2004).

NSF panelist and reviewer for grants in the Particle Theory, Outreach, and ADVANCE programs.

Grant reviewer for the Chilean Research Council (FONDECYT), the Commonwealth

of Virginia, the DOE and NSF programs in high-energy physics, and Research Corporation.

Manuscript referee for Computer Physics Communications, European Physical Journal C,

Europhysics Letters, Journal of High-Energy Physics, Journal of Physics G, Modern Physics ,

Letters A, Nuclear Physics B, Physical Review D, Physical Review Letters, and Physics Letters B.

Member, American Association of Physics Teachers. (Since 1996).

Member, Sigma Xi. (Since 2007).

WORK ON GENDER & SCIENCE AND EDUCATIONAL OUTREACH

Gender & Science

Chair, Founding Committee of the APS Forum on Diversity & Inclusion. (Since 2016).

The formation of an APS Forum on Diversity and Inclusion was recommended in the report on the LGBT Climate in Physics. This committee is charged with drafting bylaws, gathering signatures of prospective members, and making the case to the APS governing council.

Member, American Physical Society *ad hoc* Committee on LGBT Issues (2014-16).

This committee was charged with researching the status of LGBT physicists in the US and recommending how the APS can become more inclusive. The final report is available at <http://www.aps.org/programs/lgbt/> .

Member, Organizing Board, *lgbt+ physicists*. (Since 2012).

This grass-roots organization promotes awareness and inclusion through a web presence (<http://lgbtphysicists.org>), surveys, talks, a Best Practices Guide for department chairs, and an Out List that LGBT+ physicists or allies can join.

Organizer & presenter, ICTP Workshops on Career Development for Women in Physics (2013, 2015).

U.S. Delegate to the International Conference on Women in Physics. (2008, 2011).

Hands-on presenter, Spartan Science Day at Lyman Briggs. (2006, 2007, 2008, 2009).

Hands-on presenter, MI Girls Math/Science Conference. (2004, 2006, 2007, 2008, 2009).

Founder and Scientific Organizer, Pathways Program (1994–2003) [www.bu.edu/lernet/pathways].

Pathways encouraged high-school girls to pursue studies and careers in STEM fields.

An annual two-day workshop brought 400 students and teachers from 40 local schools to BU for an intensive program of mentoring groups, tabletop experiments, lab tours, career tables, and lectures. Over 100 women scientists and engineers from academe and industry volunteered as presenters and mentors.

Co-organizer, Focal Week on Women in Physics, Aspen Center for Physics, 4 – 10 July 1994.

Due to reforms suggested by the Focal Week, women's participation in the scientific programs and governance of the ACP has more than doubled.

Mentor, Radcliffe College Alumnae Mentoring and Externship Programs. (1995–2003).

Panelist, Women's Leadership Conference, Institute of Politics, Harvard University (1998, 1999).

Scholarship Judge, Women's Initiative for Technology Leadership, Boston. (2000).

Panelist, FIRST Women in Science and Technology Forum, University of New Hampshire. (2001).

Coordinator, "Women in Mathematical and Physical Sciences",
an organization for Harvard graduate students, research staff, and faculty. (1987-89).

Member, Association for Women in Science. (Since 1992).

Member, American Association of University Women. (Since 1993).

Educational Outreach

Advisory Board, the QuarkNet national outreach program in high-energy physics. (2005-13).

Presenter at educational outreach programs including Visiting International Professionals

Program at MSU (2006, 2007, 2008, 2009, 2010); BBQ For Kids at the Aspen Center for Physics (2005, 2008, 2015); Grandparents University at MSU (2007, 2008, 2010); Physics and Astronomy REU Program (2009, 2010, 2011). ICWIP Outreach event in South Africa (2011). MSU Frontiers in the Physical Sciences for high-school teachers (2011). MSU GCAL workshops for Korean

High-School Students (spring and fall 2011). Girls to Women workshop for Lansing-area female students (2012).

Organizing Committee Member and Presenter, Einstein Day at MSU, 10 March 2005.

This event for the World Year of Physics brought 180 high-school students and teachers to MSU's Department of Physics and Astronomy for tours, talks, and demonstrations.

Co-organizer, Workshop on Education and Outreach.

Aspen Center for Physics, Aspen, Colorado, 28 June – 11 July 2004.

Physicists and educators met to exchange ideas and form collaborations. Outcomes are described in my talks at the APS Division of Particles and Fields 2004 Meeting and the September 2004 High-Energy Physics Advisory Panel Meeting, and in my January 2005 invited article in *Physics Today*.

Chair, Snowmass 2001 Education & Outreach Committee.

Organized a 3-week program of public outreach in Snowmass, CO in connection with the Summer Study on the Future of Particle Physics, June 30 - July 21, 2001.

The program of science camps for children, public lectures, star-gazing sessions, panel discussions, on-line exhibits, and a two-day interactive science fair on the pedestrian mall of Snowmass Village was run by a team of 100 volunteers and attended by over 1500 people.

Co-organizer, Saturday Science Lab on Particle Physics. (1998-2003).

With 5 faculty colleagues, developed and presented a half-day particle physics program for 30-40 high-school students once each semester.

ATLAS Team Leader, Quantum World Day. (1997).

Organized a group of BU scientists to develop an interactive web site and hands-on experiments about particle physics for the Quantum World Day event at Boston University.

MEDIA COVERAGE

Careers, Gender and Science

Presentation at press conference on ‘Women in Physics: Increasing Interest, Expansion and Equality,’ held at the American Physical Society April Meeting, 17 April 2016.

Quoted in the article “Jeff Lab Female Physicists try to plug the ‘leaky pipeline’ of women in physics,” published on *dailypress.com*, 8 May 2015.

Featured on AAAS Member Spotlight (membercentral.aaas.org), 24 July 2014.

Featured in the exhibit *STEMinists: Michigan Women in STEM*

at the Michigan Women’s Historical Center and Hall of Fame, Lansing, MI, March 2013 - February 2014.

Interviewed about the STEMinists exhibit

on *Current State*, WKAR, East Lansing, MI, 12 March 2013,

by the *Detroit Free Press*, Detroit, MI, 10 March 2013.

Featured in the article “Love in the Lab,” published in Science Careers, *Science*, 8 February 2013.

Particle Physics

Interviewed about the 2012 discovery of the Higgs Boson at CERN

on *Current State*, WKAR, East Lansing, MI, 18 March 2013,

on *Aspen Radio Physics*, 13 December 2012,

by the *Aspen Sojourner* on 10 July 2012,

by Aspen’s *Grassroots TV* on 6 July 2012,

by *Science News* on 4 July 2012,

by *Aspen Public Radio* on 4 July 2012.

My 2012 public dialog about the Higgs Boson discovery was covered

by the *Aspen Daily News* on 8 July 2012.

Interviewed about my 2008 Aspen, CO public lecture on the LHC

by *Grassroots TV* on 8 August 2008;

the lecture was filmed and streamed by *Grassroots TV* on 13 August 2008.

Interviewed about my 2008 Aspen, CO children’s science outreach event

by Michael Conniff on Con Games, *KNFO Radio* on 6 August 2008;

the event was filmed and streamed by *Grassroots TV* on 6 August 2008.

My 22 June 2005 children’s outreach event on particle physics in Aspen, CO was filmed

by *Grassroots TV* and rebroadcast throughout that summer.

My 4 February 2004 public lecture about particle physics was broadcast

by *Grassroots TV*.

Interviewed about the discovery of the top quark

by Barry Nolan on *Comcast’s Nite Beat* 27 May 2003.

INVITED PRESENTATIONS

(since 2003)

Physics Department Colloquia

‘Moving Toward Gender Equity in STEM.’

Department of Physics, University of Notre Dame, South Bend, IN, 16 March 2016.

‘Electroweak Symmetry Breaking Meets the LHC.’

Department of Physics, Westminster College, New Wilmington, PA, 11 April 2013.

‘Electroweak Symmetry Breaking without a Higgs Boson... Meets the LHC.’

Department of Physics, University of Arizona, Tucson, AZ, 20 April 2012.

Department of Physics, Wayne State University, Detroit, MI, 10 November 2011.

‘Electroweak Symmetry Breaking without a Higgs Boson.’

Department of Physics, University of Cincinnati, Cincinnati, OH, 22 April 2010.

Physics Department, Brookhaven National Laboratory, Upton, NY, 20 April 2010.

Department of Physics, University of Kentucky, Lexington, KY, 4 September 2009.

Department of Physics, University of South Florida, Tampa, FL, 3 April 2009.

Weihai Forum on the Frontiers of High-energy Physics, Weihai, China, 9 July 2008.

Tsinghua University, Beijing, China, 14 December 2006.

‘Women in Physics in the United States: Numbers, Causes, and Solutions.’

Marquette University, Milwaukee, WI, 6 September 2012.

Jefferson National Laboratory, Newport News, VA, 5 April 2012.

Nagoya University, Nagoya, Japan, 7 December 2009.

‘Theoretical Particle Physics: Electroweak Symmetry Breaking.’

1st Global COE Winter School, Aqua Villa, Ise-Shime, Japan, 19 February 2009.

‘Educational Outreach in Physics.’

University of Illinois, Champaign, IL, 8 November 2007.

Brown University, Providence, RI, 22 October 2007.

Western Michigan University, Kalamazoo, MI, 15 October 2007.

Indiana University, Bloomington, IN, 20 September 2006.

Fermi National Accelerator Laboratory, Batavia, IL, 22 March 2006.

Michigan State University, East Lansing, MI, 29 September 2005.

Northwestern University, Evanston, IL, 13 May 2005.

‘Why Is This Quark Different From All Other Quarks?’

Florida State University, Tallahassee, FL, 31 March 2005.

Lawrence University, Appleton, WI, 6 April 2004.

Williams College, Williamstown, MA, 16 May 2003.

Michigan State University, East Lansing, MI, April 2003.

University of North Carolina at Wilmington, 28 March 2003.

Particle Physics – Invited Lectures at Graduate Summer Schools

‘Top Quark and Electroweak Phenomenology.’

Two lectures. Theoretical Advanced Study Institute in Particle Physics,

University of Colorado, Boulder, CO, 19 & 20 June 2013.

‘Higgsless and Technicolored Strong Dynamics.’

Two lectures at the Pan-American Advanced Studies Institute: Exploring the Terascale and Beyond. University of Buenos Aires, Buenos Aires, Argentina, 8-9 March 2012.

‘Higgsless Electroweak Symmetry Breaking at the LHC.’

Tsinghua University Summer School, Beijing, China, 20 August 2010.

‘Dynamical Electroweak Symmetry Breaking and the Top Quark.’

Tsinghua University Summer School, Beijing, China, 18 August 2010.

‘Higgsless Electroweak Symmetry Breaking.’

1st Global COE Winter School, Aqua Villa, Ise-Shime, Japan, 20 February 2009.

‘Electroweak Symmetry Breaking and Flavor Physics.’

Three lectures. International Summer Symposium on Frontiers in Particle Physics:

Beyond the Standard Model. Tsinghua University, Beijing, China, 7-11 August, 2006.

‘Dynamical Electroweak Symmetry Breaking Theory and Models.’

Two lectures. Theoretical Advanced Study Institute in Particle Physics,

University of Colorado, Boulder, CO, June 2004.

Particle Physics – Conference Talks

‘Simplified Limits on Resonances at the LHC.’

DPF 2017, Fermi National Accelerator Laboratory, Batavia, IL, 2 August 2017

PHENO Symposium 2017, University of Pittsburgh, Pittsburgh, PA, 8 May 2017

New Physics Interpretations Workshop, Argonne National Laboratory, Argonne, IL, 7 April 2017

‘Model-Independent Simplified Limits on Resonances at the LHC.’

XIIth Quark Confinement and the Hadron Spectrum, Thessaloniki, Greece, 1 September 2016.

‘Diphoton Resonance as Evidence for an Extended Color Sector.’

PHENO Symposium 2016, University of Pittsburgh, Pittsburgh, PA, 9 May 2016.

‘Separating Dijet Resonances using the Coloron Discriminant Variable at LHC.’

PHENO Symposium 2015, University of Pittsburgh, Pittsburgh, PA, 4 May 2015.

SCGT 2015, Nagoya University, Nagoya, Japan, 6 March 2015.

‘A Flavorful Coloron Model.’

Workshop: Towards the Construction of the Fundamental Theory of Flavour, Technical University of Munich Institute for Advanced Study, Munich, Germany, 10 December, 2013.

‘Identifying Colorons at the LHC.’

SCGT14Mini, Nagoya University, Nagoya, Japan. 5 March 2014.

LHC: The First Part of the Journey, Kavli Institute for Theoretical Physics,

Santa Barbara, CA, 10 July 2013.

‘Coloron Models and LHC Phenomenology.’

KMI-GCOE Workshop on Strong Coupling Gauge Theories in the LHC Perspective (SCGT12), Nagoya University, Nagoya, Japan, 5 December 2012.

‘Coloron Models and LHC Phenomenology [and also the Conference Summary Talk].’

Conference on LHC Physics, Tsinghua University, Beijing, China, 14 November 2012.

‘Topcolor: An Update.’

Origin of Mass 2012, Nordita, Stockholm, Sweden. 6 June 2012.

‘Strong Dynamics in Electroweak Physics.’

PHENO Symposium 2012, University of Pittsburgh, Pittsburgh, PA, 7 May 2012.

‘Strong Top Dynamics in Light of LHC Data.’

Strong Coupling Gauge Theories (SCGT12Mini), Nagoya University, Nagoya, Japan, 18 March 2012.

‘Topcolor in the LHC Era.’

- Kobayashi-Maskawa Institute Inauguration Conference (KMIIN), ‘Quest for the Origin of Particles and the Universe,’ Nagoya University, Nagoya, Japan, 26 November 2011.
- ‘Recognizing Higgsless Physics at the LHC.’
Particle Physics Workshop, University of Wisconsin, Madison, WI, 8 May 2011.
- ‘Higgsless Model Phenomenology at LHC: New Fermions Decaying to W or Z .’
Topical Program on LHC Physics: W , Z , and Beyond, National Center for Theoretical Sciences
National Tsing Hua University, Hsinchu, Taiwan, 26 October 2010.
- ‘The Top Triangle Moose: Combining Higgsless and Topcolor Mechanisms for Mass Generation.’
2009 International Workshop on Strong Coupling Gauge Theory,
Nagoya University, Nagoya, Japan, 9 December 2009.
- ‘Higgsless Electroweak Symmetry Breaking.’
DEWSB Workshop, University of Southern Denmark, Odense, Denmark, 13 September 2008.
- ‘Electroweak Symmetry Breaking and the Top Quark Mass: Hypercharge-Universal Topcolor.’
Kavli Institute for Theoretical Physics China, Beijing, China, 2 July 2008.
- ‘Phenomenology of a Three Site Higgsless Model.’
Workshop on Collider Physics, Argonne National Laboratory, Argonne, IL, 9 May 2006.
- ‘Two Sketches: Higgsless and Z' Models.’
Workshop on Monte Carlo for Physics Beyond the Standard Model (MC4BSM),
Fermilab, Batavia, IL, 21 March 2006.
- ‘Higgsless Models: Lessons from Deconstruction.’
Workshop on Flavor Physics Beyond the Standard Model, Ochanomizu University,
Tokyo, Japan, 13 December 2005.
- Xth Mexican Physical Society Workshop on Particles and Fields, Morelia,
Michoacan, Mexico, 10 November 2005.
- KAIST/KIAS Advanced Workshop on Particle Physics, Seoul, Korea, 12 October 2005.
- ‘Dynamical Electroweak Symmetry Breaking Theory and Models.’
KEK Theory Meeting on Particle Physics Phenomenology,
KEK National Laboratory, Tsukuba, Japan, 4 March 2005.

Particle Physics – Research Seminars

- ‘Identifying Dijet Resonances at the LHC.’
University of Notre Dame, South Bend, IN, 15 March 2016.
- TOTW Seminar, Fermi National Accelerator Laboratory, Batavia, IL, 27 May 2015.
- ‘Identifying Colorons at the LHC.’
University of Chicago, Chicago, IL, 15 November 2013.
- Yale University, New Haven, CT, 26 September 2013.
- ‘Strong Top Quark Dynamics in the LHC Era.’
Jefferson National Laboratory, Newport News, VA, 4 April 2012.
- ‘Dynamical Symmetry Breaking in the LHC Era.’
Kobayashi-Maskawa Institute, Nagoya University, Nagoya, Japan, 31 October 2011.
- ‘LHC Phenomenology of The Top Triangle Moose.’
Fermi National Accelerator Laboratory, 11 August, 2011.
- ‘Axiguons vs. Asymmetry.’
Poster presentation at 4th IUPAP Int’l. Conf. on Women in Physics,
Stellenbosch, South Africa, 8 April 2011.

- University of Michigan, Ann Arbor, MI, 19 November 2010.
- ‘Deconstructed Higgsless Models at the LHC.’
22nd Rencontres de Blois, Blois, France, July 2010.
- ‘The Top Triangle Moose: Combining Higgsless and Topcolor Mechanisms for Mass Generation.,’
Boston University, Boston, MA, 22 February 2010.
- ‘Hypercharge-Universal Topcolor’
Fermi National Accelerator Laboratory, 11 March 2009.’
- ‘Higgsless Models of Electroweak Symmetry Breaking in the LHC Era.’
Particles and Nuclei in Collision 2008, Eilat, Israel, 11 November 2008.
- ‘Phenomenology of the Three-Site Higgsless Model.’
Poster Presentation at the 3rd IUPAP International Conference on Women in Physics,
Seoul, Korea, 9 October 2008.
PHENO Workshop 2008, University of Wisconsin, Madison, WI, 28 April 2008.
Kavli Institute for Theoretical Physics, Santa Barbara, CA, 11 March 2008.
University of Illinois, Champaign, IL, 8 November 2007.
- ‘A Three-Site Higgsless Model.’
PHENO Workshop 2007, University of Wisconsin, Madison, WI, 7 May 2007
Institute of Theoretical Physics / Chinese Academy of Sciences, Beijing, China, 13 December 2006.
University of Wisconsin, Madison, WI, 10 November 2006.
Joint Meeting of Pacific Region Particle Physics Communities, Honolulu, HI, 30 October 2006.
- ‘The Meaning of “Higgs”: $\tau\tau$ and $\gamma\gamma$ at Hadron Colliders.’
Fermi National Accelerator Laboratory, 23 March 2006.
- Higgsless Models: Lessons from Deconstruction.’
Tohoku University, Sendai, Japan, 16 December 2005.
- ‘The Structure of Precision Electroweak Corrections in Extended Gauge Models.’
University of Michigan, Ann Arbor, MI, 29 March 2004.
Argonne National Laboratory, Argonne, IL, 8 March 2004.
University of Maryland, College Park, MD, November 2003.
- ‘Particle Physics Project Prioritization Panel: Deliberations and Conclusions.’
University of Michigan, Ann Arbor, MI, 29 March 2004.
Michigan State University, October 2003.
- ‘Flavor, Composite Higgs, and Theory Space.’
Ohio State University, Columbus, OH, October 2003.
Massachusetts Institute of Technology, 19 May, 2003.

Particle Physics – Public Lectures

- ‘News Flash: CERN Reports on the Higgs Boson.’
University of Colorado, Boulder, CO, 20 June 2013.
Woods Lecture, Westminster College, New Wilmington, PA, 11 April 2013.
Public Presentation to the Michigan State University Board of Trustees,
East Lansing, MI, 26 October 2012.
Public Dialog, Aspen Center for Physics, Aspen, CO, 6 July 2012.
- ‘Physics at the Energy Frontier: The Quest to Uncover the Origin of Mass.’
After Hours Talk Series, Institute for Advance Study, Princeton, NJ, 19 October 2009.
- ‘What’s coming at the Large Hadron Collider?’

Talk and panel discussion, Paepcke Auditorium, Aspen, CO, 13 August 2008.
'Tritium, Chocolate, and Ping-Pong Balls.'

Aspen Center for Physics, Physics BBQ Series, Aspen, CO, 6 August 2008.
'Sub-atomic Mystery Particles.'

Aspen Center for Physics, Physics BBQ Series, Aspen, CO, 20 July 2005.
'Fundamental Particles, Fundamental Questions.'

Lawrence University, Appleton, WI, 5 April 2004.

Aspen Center for Physics Winter Lecture Series, 4 February 2004.

Michigan State University, East Lansing, MI, January 2003.

Particle Physics – Talks for Students and Teachers

'Discovering New Forces at Particle Colliders.'

LBC Women in Science, Michigan State University, East Lansing, MI, 3 February 2015.

'Fundamental Particles, Fundamental Questions.'

Global Center for Advanced Learning (addressing students from Korea)

Michigan State University, 11 February 2011 and 15 November 2011.

Frontiers in Physical Science program for High-school Science Teachers,

Michigan State University, 12 November 2011.

MSU REU program, Michigan State University, 13 June 2011, 30 July 2010, and 4 June 2009.

Introductory Physics (LB272), Michigan State University,

22 April 2011 and 16 April 2010.

Visiting International Professional Program, Michigan State University.

Summers of: 2010, 2009, 2008, 2007, and 2006.

Society of Physics Students, Michigan State University, 23 March 2009.

The Summer Science Program, New Mexico Tech, Socorro, NM 19 June 2008.

'Light and Atoms.'

Physics Day, Renish High School, Stellenbosch, South Africa, 9 April 2011.

'Physics in Winterson's *Gut Symmetries*' [Classroom discussion].

Topics in the History of Science (LB330), Michigan State University, 30 March 2011.

'Electroweak Symmetry Breaking Without a Higgs Boson.'

Visiting International Professional Program, Michigan State University. 29 July 2010.

'Quantum Concepts.' [Classroom discussion].

Topics in the History of Science (LB330), Michigan State University, 16 April 2010.

'Atoms and Nuclei.'

Visiting International Professional Program, Michigan State University. 2008 and 2009.

Science and Society

'C.P. Snow's Two Cultures... and Dan Brown's *Angels & Demons*,'

Conference on C.P. Snow and the Two Cultures, Michigan State University, 28 May 2009.

'How Do We Know?'

Phi Beta Kappa Oration, Michigan State University Induction Ceremony, 13 April 2008.

Lyman Briggs College Commencement Gathering, Michigan State University, 6 December 2008.

Gender and Science

‘Diversity and Inclusion in Physics.’

Plenary talk, DPF 2017, Fermi National Accelerator Laboratory, 2 August 2017.

‘Shaping a Life in Physics.’

Keynote address, Conference for Undergraduate Women in Physics,
Wayne State University, Detroit, MI, 14 January 2017.

‘Promoting Gender Equity in STEM: Theory and Applications.’

Society for Women in Physics and Astronomy, Michigan State University, 11 November 2016.

Colloquium, Center for Gender in Global Context, Michigan State University, 16 September 2016.

American Physical Society April Meeting, Salt Lake City, UT, 17 April 2016.

‘Sexual and Gender Diversity Issues in Physics C-LGBT Ad Hoc Committee Report.’ [panel presentation]

American Physical Society April Meeting, Salt Lake City, UT, 16 April 2016.

‘Moving toward Gender Equity in the STEM Workforce.’

ICTP Workshop on Career Development for Women Physicists, Trieste, Italy, 10 October 2015.

Fermi National Accelerator Laboratory, Batavia, IL, 26 May, 2015.

US Department of Energy Diversity and Inclusion Network, Washington, DC, 30 September 2014.

Jefferson National Laboratory, Newport News, VA, 22 March 2013.

‘Toward Gender Equity in Physics.’

Invited presentation at CSWP Networking Luncheon, APS April Meeting, Denver, CO, 14 April 2013.

‘Women in Physics in the United States: An Update.’ [Poster presentation].

4th IUPAP International Conference on Women in Physics, Stellenbosch, South Africa, 7 April 2011.

‘Perspective of a Woman Leader in Science.’ [Panel presentation].

Celebrating Women as Community Leaders, Niagara Foundation, Lansing, MI, 17 March 2011.

‘Gender and Science.’ [Classroom panel presentations].

‘Leaky Pipeline’ Graduate Seminar (NEU 992),

Michigan State University, East Lansing, MI, 28 April 2010.

Undergraduate History of Science Class (LB 330), Michigan State U., East Lansing, MI, 16 April 2009.

‘Women in Physics in the United States: Numbers, Causes, and Solutions.’

Presentation and Discussion, Women in Physics Group, University of Cincinnati,
Cincinnati, OH, 22 April 2010.

Women in Science Organization, Brookhaven National Laboratory, Upton, NY, 20 April 2010.

‘Women in Higher Education Leadership: Lessons Learned.’

Women in Science and Engineering, Boston University, Boston, MA, 22–23 February 2010.

Panel Presentation at the American Council on Education’s Annual

Michigan Leadership Conference, East Lansing, MI, 12 June 2007.

‘Women in Physics in the United States.’ [Poster presentation].

3rd IUPAP International Conference on Women in Physics, Seoul, Korea, 8 October 2008.

‘Pathways into Science for High-School Girls.’

March Meeting of the American Physical Society, Montreal, CA, 24 March 2004.

‘Really?... You Don’t Look Like a Physicist! : Tales From the Leaky Pipeline.’

Lyman Briggs School, Michigan State University, East Lansing, MI, September 2003.

Educational Outreach

‘Educational Outreach in the United States.’ [Panel presentation via EVO].

Communicare Fisica III, Frascati, Italy, 14 April 2010

‘A Playful Approach to Physics (the serious business of educational outreach).’

Minute Particulars and Hidden Symmetries, a Symposium Honoring Chris Quigg.

Fermi National Accelerator Laboratory, 14 December 2009.

‘Student-Led Outreach: Spartan Science Day.’

3rd IUPAP International Conference on Women in Physics, Seoul, Korea, 8 October 2008.

Fermilab Users Executive Committee Outreach Workshop, Batavia, IL, 5 June 2007.

Joint Meeting of Pacific Region Particle Physics Communities, Honolulu, HI, 30 October 2006.

‘Popularizing Particle Physics.’ [Invited plenary lecture].

Meeting of the APS Division of Particles & Fields, Riverside, CA, August 2004.

‘Education and Outreach: Results of Aspen Education & Public Outreach Workshop.’

Presentation to the High-Energy Physics Advisory Panel, Washington D.C., 24 September 2004.

‘The World of Subatomic Particles: HEP High-School Outreach.’

Meeting of the APS Division of Particles & Fields, Philadelphia, PA, 5 April 2003.

Academic Leadership and Faculty Development

‘Career Development for Graduate Students in High-Energy Physics,’

Special Session, PHENO Symposium 2017, University of Pittsburgh, Pittsburgh, PA, 8 May 2017.

‘Supporting Academic Staff: Perspectives from a Dean and Associate Provost,’

Academic Specialist Professional Development Forum, Michigan State University, 7 February 2017.

‘Moving the Needle through Professional Development with ACE Programs.’ [panel presentation]

MI-ACE Womens Network Annual Conference, Lansing, MI, 7 June 2016.

‘Academic Work Life Compatibility: Opportunities, Challenges, and Possibilities.’ [panel presentation]

WorkLife Symposium, Michigan State University, 1 April 2016.

‘Leading Change to Minimize the Impact of Implicit Bias.’

LEAD Workshop on Implicit Bias, Michigan State University, 2 February 2016.

‘Perspectives of an Academic Leader.’ [Q&A format]

Big Ten Academic Alliance Leadership Fellows, Michigan State University, 24 April 2017

New Chairs’ Workshop, Michigan State University, 1 December 2016.

New Deans’ Academy, Michigan State University, 2 December 2016 and 9 October 2015.

Leadership Learning Community, Michigan State University, 15 January 2016 and 24 March 2015.

CIC Academic Leadership Program,

University of Wisconsin, Madison, MI, 6 November 2015

University of Michigan, Ann Arbor, MI, 3 November 2012.

CIC Academic Leadership Fellows, Michigan State University, 19 March 2015

‘Starting Your Faculty Career.’ [Q&A format]

New Faculty Orientation, Michigan State University, 23 August 2016 and 25 August 2015.

‘Survive and Thrive in the Tenure System: Administrative Perspective.’ [panel presentation].

Workshop, Michigan State University, 23 February 2017

also on 19 February 2015, 21 February 2013, 13 October 2011, and 16 October 2008.

‘Thriving by 35: Family Planning as a Young Professional.’ [panel presentation]

Women’s Resource Center, Michigan State University, 6 November 2014.

‘Women in Leadership: Pathways and Problem-Solving.’ [panel presentation]

WFLAL workshop, Michigan State University, , 28 March 2013.
'Supporting and Rewarding STEM Teaching Innovation.'
AAC&U conference on Next Generation STEM Learning, Kansas City, MO, 9 November 2012.
'College Budgeting and Financial Planning.'
WFLAL workshop, Michigan State University, 8 October 2012.
'Transitioning from Faculty to Administrative Roles.'
WFLAL workshop, Michigan State University, 29 March 2012.
'Using the results of Physics Education Research in college teaching.'
4th IUPAP Int'l. Conference on Women in Physics, Stellenbosch, South Africa, 8 April 2011.
'Evaluation of Teaching in Lyman Briggs College... and Beyond.' [Panel presentation].
The Evaluation of Teaching: New Models, New Requirements, New Opportunities.'
Michigan State University, 29 March, 2011.
'Handling Joint Appointments: Tips for New Administrators.' [Panel presentaiton]
Michigan State University, 29 March 2010.
'Faculty Mentoring in Lyman Briggs.' [Panel presentations].
LEAD Workshop, Michigan State University, 21 May 2009.
MULTI Workshop, Michigan State University, 22 November 2005.
'The Best of Both Worlds.'
APS March Meeting (New Faculty Workshop Session), Pittsburgh, PA, 16 March 2009.
'Fresh Perspectives on Academic Careers in the Sciences.' [Panel presentation].
Graduate Women in Science, Michigan State University, 13 November 2006.
'Science Educators in STEM Disciplinary Groups at the Lyman Briggs School.'
Panel Presentation, Workshop on Education Research Positions in STEM Disciplinary
Departments, National Academies of Science, Washington DC, 5 December 2005.
'Progressing Toward Tenure.'
April Meeting of the American Physical Society, Albuquerque, NM, 20 April 2002.

Issues in Higher Education

'Bridging the STEM Diversity Gap [invited panel presentation].'
U.S. News STEM Solutions 2017. San Diego, CA. 25 May 2017.
'Information Technology's Role in Academe [panel presentation].'
LEAD Workshop, Michigan State University, East Lansing, MI, 11 November 2015.
'The Role of Residential Colleges.'
RHS Professional Development Program, Michigan State University, 11 November 2015.
'Information Technology and the Lyman Briggs Vision.'
IT Leadership Council, Michigan State University, 11 July 2014.
'From Asteroid Orbits to the Higgs Boson: Why Your Undergraduate Research is Important'
West Michigan Regional Undergraduate Research Conference,
Van Andel Research Institute, Grand Rapids, MI, 17 November 2012.
'How Lyman Briggs College Prepares STEM Students for the Careers of the Future'
Agricultural Leaders of Michigan, Meeting on Workforce Development
Lansing, MI, 15 August 2012.
'Helping Diverse STEM Students Succeed in Lyman Briggs College'
Annual Retreat of the MSU Board of Trustees. Michigan State University, MI, 20 June 2012.
'Diary of a Leadership Journey.'

Information Technology Leadership Program

Michigan State University, 11 June 2012.

‘Themes Pointing the Way Forward.’

3rd Annual STEM Symposium: The Impact of Low Mathematics Preparation on STEM Curricula

Michigan State University, 18 October 2011.

‘A Faculty Ally’s Perspective.’ [Panel presentation]

Faculty Coming Out Panel, hosted by The Queer Students Alliance and the GLFSA,

Michigan State University, 12 October 2011.

Careers in Science (for K-12 students)

‘University Careers in Science’ [panel presentations]

Career Day, The Pingry School, Martinsville, NJ, 29 January 2016.

‘Studies and Careers in Science’ [panel presentation]

Girls to Women Conference, Lansing, MI, 12 June 2012.

‘Physics in Your Future.’

Science Club, Okemos High School, Okemos, MI, 14 March 2012.

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4. Direct Search Implications for a Custodially-Embedded Composite Top,’ with R.S. Chivukula, D. Foren, and R. Foadi. *Physical Review* **D94**, 014002, 2016 (8 pages).
5. Diphoton Resonances in the Renormalizable Coloron Model,’ with R.S. Chivukula, A. Farzinnia, and K.A. Mohan. *Physical Review* **D94** 035018, 2016 (12 pages).
6. ‘Color Discriminant Variable and Scalar Diquarks at the LHC,’ with R.S. Chivukula, P. Ittisamai, and K.A. Mohan. *Physical Review* **D92** 075020, 2016 (12 pages).
7. ‘Vacuum Stability and Triviality Analyses of the Renormalizable Coloron Model,’ with R.S. Chivukula and A. Farzinnia. *Physical Review* **D92** 055002, 2015 (17 pages).
8. ‘Distinguishing Di-jet Resonances at the LHC,’ with R.S. Chivukula and Natascia Vignaroli, *Physical Review* **D91** 055019, 2015 (11 pages).
9. ‘Distinguishing Flavor Non-universal Colorons from Z' Bosons at the LHC,’ with R.S. Chivukula and Pawin Ittisamai. *Physical Review* **D91** 055021, 2015 (16 pages).
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11. ‘Constraints on the Scalar Sector of the Renormalizable Coloron Model,’ with R.S. Chivukula, A. Farzinnia and J. Ren. *Physical Review* **D88**: 075020, 2013 (20 pages).
12. ‘Distinguishing Color-Octet and Color-Singlet Resonances at the Large Hadron Collider,’ with A. Atre, R.S. Chivukula, and P. Ittisamai. *Physical Review* **D88**: 055021, 2013 (24 pages).
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14. ‘Hadron Collider Production of Massive Color-Octet Vector Bosons at Next-to-Leading Order,’ with R.S. Chivukula, A. Farzinnia, and J. Ren. *Physical Review* **D87**: 094011, 2013. (22 pages).
15. ‘A Flavorful Top-Coloron Model,’ with R.S. Chivukula and N. Vignaroli. *Physical Review* **D87**: 075002, 2013. (18 pages).
16. ‘Discovering Strong Top Dynamics at the LHC,’ with R.S. Chivukula, B. Coleppa, P. Ittisamai, H.E. Logan, A. Martin, and J. Ren. *Physical Review* **D86**: 095017, 2012. (25 pages).
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