

Biographical Sketch: Tulika Bose

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Professional Preparation:

- St. Stephen's College, Delhi University, New Delhi (India), Physics (Honours), B.Sc. (1996).
- Cambridge University, Cambridge (U.K.), Natural Sciences Tripos, B.A. (1998).
- Columbia University, New York (USA), Experimental Particle Physics, Ph.D. (2006).
- Brown University, Providence (USA), Post-doctoral training (2008).

Professional Appointments:

- Vilas Distinguished Achievement Professor of Physics, University of Wisconsin-Madison (2024 – present)
- Professor, Physics Department, University of Wisconsin-Madison (August 20th, 2018 – 2023)
- Associate Professor, Physics Department, Boston University (May 2015 - August 2018)
- Assistant Professor, Physics Department, Boston University (2008-2015)

Honors, Awards & Appointments:

- **Member, Particle Physics Project Prioritization Panel (P5) (2023)** P5 is a scientific advisory body tasked by DOE and NSF to develop a strategic plan and vision for US particle physics for the next decade and beyond.
- **Elected Fellow, American Physical Society (2019)** “For leadership coordinating the CMS physics program and trigger system, and for contributions to the development of high level triggers and searches for heavy vector bosons and vector-like quarks.”
- **Appointed Deputy U.S. CMS Software & Computing Operations Program Manager (September 2019 – present):** The U.S. CMS Software & Computing Operations program is responsible for developing and operating the software and computing resources necessary to process data from the CMS experiment expeditiously and help enable U.S. physicists to fully participate in the physics of CMS. As Deputy Program Manager, help oversee a \$17M annual budget that funds activities at 17 different U.S. institutes.
- **Appointed CMS Physics Co-coordinator (September 2017 – August 2019):** The CMS Physics Co-Coordinator is one of two lead scientists charged with reviewing the entire scientific output of the CMS experiment. This includes defining the goals and types of research that collaborators will undertake and being responsible for organizing activities to produce and review all of the physics results. CMS scientists publish over 100 papers each year. The Physics Co-coordinator oversees all of the issues that go into ensuring that the results are correct and the best that can be produced.
- **Appointed co-convener of the CMS Beyond 2 Generations (B2G) physics analysis group (September 2016 – August 2017):** There are three primary groups within CMS conducting searches for new physics: SUSY (focusing on searches based on Supersymmetric models), B2G (searches for new physics with heavy standard model particles e.g. dibosons, new heavy quarks, resonances with top quarks etc.) and Exotica (other new physics searches that do not fall under SUSY and B2G). The B2G group conveners are responsible for coordinating and reviewing analysis efforts within their group and ensuring their timely publication.

- **Appointed Trigger Coordinator of the Compact Muon Solenoid (CMS) Experiment (September 2014 – August 2016):** CMS is a ≈ 5000 member collaboration and is headed by a group of about fifty people (CMS Management Board) responsible for directing the CMS experiment and for drawing up policy. All important matters of scientific and technical nature, safety, organization and finance are discussed by this group which is ultimately responsible for various tasks and projects within the experiment. The Trigger Coordinator and the deputy are members of this select group and oversee the activities of the CMS Trigger Studies group that is responsible for providing triggers that are tailored for the physics priorities of the experiment.
- **Recipient of the 2014 CMS Distinguished Researcher Award:** This is awarded annually by Fermi National Accelerator Laboratory (Fermilab)/Department of Energy to some of the top CMS scientists.
- **Awarded 2012 Alfred P. Sloan Research Fellowship:** “Awarded annually since 1955, the fellowships are given to early-career scientists and scholars whose achievements and potential identify them as rising stars, the next generation of scientific leaders.”
- **Appointed by the CMS Experiment as the CMS Deputy Trigger Coordinator (June 2011 – March 2013)**

Selected publications: [I have over 1500 publications. Continuously updated full list is available at <https://inspirehep.net/literature?sort=mostrecent&size=25&page=1&q=author%3AT.Bose.1%20AND%20collection%3Aciteable>. Some selected publications to which I have made several key contributions are given below:]

- CMS Collaboration, “Measurement of Higgs boson production in the decay channel with a pair of τ leptons in proton-proton collisions at $\sqrt{s} = 13$ TeV, arXiv:2204.12957, Eur. Phys. J. C 83 (2023) 562.
- T. Bose et al., “Report of the Topical Group on Physics Beyond the Standard Model at Energy Frontier for Snowmass 2021”, arXiv: 2209.13128
- M. Narain et al., “The Future of US Particle Physics – The Snowmass 2021 Energy Frontier Report”, arXiv:2211.11084
- CMS Collaboration, “Measurement of the inclusive and differential Higgs boson production cross sections in the decay mode to a pair of τ leptons in pp collisions at $\sqrt{s} = 13$ TeV”, Phys. Rev. Lett. 128 (2022) 081805.
- CMS Collaboration, “Search for dark matter produced in association with a single top quark or a top quark pair in proton-proton collisions at $\sqrt{s} = 13$ TeV,” JHEP 03 (2019) 141.
- CMS Collaboration, “Search for heavy resonances decaying to a top quark and a bottom quark in the lepton+jets final state in proton-proton collisions at 13 TeV”, Phys. Lett. B 777 (2018) 39.
- CMS Collaboration, “Search for top-quark partners with charge 5/3 in the same-sign dilepton final state”, Phys. Rev. Lett. 112 112 171801 (2014).
- CMS Collaboration, “Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC”, Phys. Lett. B 716 (2012) 30.

- L. Agostino et al., “Commissioning of the CMS High Level Trigger”, JINST 4:P10005, 2009.

Research Interests & Recent Positions of Responsibility:

- Co-organizer USCMS Program for Undergraduate Research SUMMER Experience (PURSUE) (2022 – present) [This is a 10-week paid internship program that seeks to address the under-representation of women and minoritized students in STEM fields by providing internship opportunities to 20 students from non-R1 institutes]
- Deputy US CMS Software & Computing Project Manager (2019 – present)
- Co-convener of the Snowmass 2021 EF09 group (2020 – 2022)
- CMS Physics Co-coordinator (2017 – 2019)
- Co-convener of the “Trigger & DAQ (including Machine Learning)” group for the DOE Basic Research Needs Study (2019 – 2020)
- CMS B2G (Beyond 2 Generations) Physics Group Co-convener (2016 – 2017)
- CMS Trigger Co-coordinator (2014 – 2016)
- USCMS Physics Liaison (2013 – 2014)
- Co-convener of the Resonances group within the CMS Beyond Two Generations physics analysis group (2012 – 2014)
- CMS Deputy Trigger Coordinator (2011 – March 2013)
- Member of EXO/B2G Publication Committee (PubCom) (2013 – 2014)
- Co-convener of the CMS Electroweak Di-boson (WW, WZ, ZZ) group (2011)
- Co-convener of the CMS Trigger Menu Integration group (2007 – 2011)
- Lead developer and initiator of the CMS Exotica hotline. This was a novel effort designed to create a “hotline” for exotic events (2010 – 2011)
- L1 Trigger liaison for the Hadron Calorimeter (HCAL) group and developer of the HCAL L1 trigger emulation (2006 – 2010)

International/National Committee Memberships:

- Member of P5 (Particle Physics Project Prioritization Panel) (2023)
- Elected Secretary/Treasurer of the APS Division of Particles and Field (DPF) Executive Committee (2022 - 2024);
- Elected member and Vice-Chair, AURA Management Council for the Vera C. Rubin Observatory (AMCR) (07/2022 - 06/2025);
- Elected member-at-large of the American Physical Society (APS) Division of Particles and Field (DPF) Executive Committee (2017 – 2019);
- Member of the Fermilab LHC Physics Center Management Board (2014 – 2016);

- Member of the CMS Management Board (2014 – 2016);
- Member of the U.S. LHC Users Association Executive Committee (2014 – 2015);
- Elected member of the Fermilab User’s Committee (2013 – 2014);
- Member of the committee to select the recipient of the Alvin Tollestrup award for outstanding postdoctoral research (2013 – 2014);
- Elected member of the committee to select the Fermilab LHC Physics Center Coordinator (2012);
- Member of the committee to select Guests and Visitors for the LHC Physics Center at Fermilab (2013 – 2014);
- Member of the CMS Extended Executive Board (2011 – 2013).

Peer/Book Review Activities:

- Associate Editor for European Journal of Physics (EPJC): 2019-present;
- Served as reviewer for: Department of Energy, National Science Foundation, Physics Letters B, Journal of High Energy Physics, Cambridge University Press, European Research Council, Netherlands Organisation for Scientific Research (NWO, the Dutch research council).

Conference/workshop Organization:

- Deputy Chair, LHCP International Advisory Committee (2022 - 2023)
- Chair, LHCP International Advisory Committee (2021 - 2022).
- LHCP International Co-chair (2019 - 2021).
- CIPANP 2021 Organizing Committee member.
- International Advisory Committee member LISHEP2021.
- LHCP 2019 Program Committee member.
- Co-convener of “Higgs and Electroweak Symmetry Breaking” sessions at the 2017 DPF meeting, July 2017.
- Co-convener of Higgs and Beyond the Standard Model sessions at the 2017 APS meeting, January 2017.
- Organizer of the CMS Beyond Two Generations Run 2 Preparation Event, Fermilab, October 2014.
- Co-convener of the Higgs/Electroweak sessions at LHC Physics (LHCP) Conference 2013;
- Program Committee member and organizer of the 2011 Particles and Nuclei International Conference (PANIC);
- Organizer of the “Computing in High Energy Physics Symposium” held during ICCMSE 2009 at Rhodes, Greece.

Service to University/Physics Department:

- University of Wisconsin-Madison:
 - VCRGE Fall Research Competition Committee (2021, 2022, 2023)
 - Chair, Climate & Diversity Committee (2021 – present)
 - Physics Majors Advisor (2021 – present)
 - Faculty Senator (2021 – present)
 - Mentoring Committee (Asst. Prof. Muenchmeyer) (2021 – present)
 - Service Courses Committee (2020 – 2022)
 - Chair, Outreach Committee (2020 – 2021)
 - Colloquium Committee (2020 – 2021)
 - Student Awards Committee (2020 – 2021)
 - Faculty Search Committee (Cosmology) (2019 – 2020)
 - Staff Recognition and Salaries (2019 – 2020)
- Boston University:
 - Admissions Committee: 2008 – 2009, 2009 – 2010, 2011 – 2012, 2012 – 2013
 - Chair’s Advisory Committee: 2013 – 2014, 2016 – 2017
 - Colloquium Committee: 2008 – 2009, 2009 – 2010, 2012 – 2013, 2013 – 2014
 - Comprehensive Examination Committee: 2010 – 2011, 2011 – 2012
 - Conversion Committee: 2009 – 2010, 2010 – 2011, 2012 – 2013, 2013 – 2014, 2016 – 2017
 - Diversity Committee: 2015 – 2016
 - Geneva Undergraduate Physics Program Committee: 2009 – 2010, 2010 – 2011, 2011 – 2012, 2012 – 2013, 2014 – 2015
 - High Energy Experiment Seminar Series (**chair**): 2013 – 2014, 2014 – 2015
 - Long-term Planning Committee: 2013 – 2014
 - Merit Committee: 2015 – 2016, 2016 – 2017 (**chair**)
 - Studio Teaching and RULE Grant Committee: 2010 – 2011
 - Faculty Search Committees: Collider (**chair**) [2017 – 2018], Neutrino [2015 – 2016], High Energy Theory [2014 – 2015]
 - WISE (Women in Science and Engineering) at Warren Committee: 2009 – 2013

Current Grant Funding:

- TAC-HEP: Training to Advance Computational HEP in the Exascale Era, DOE, \$ 3,968,790.00, 2022–2027, **PI**
- RENEW-HEP: U.S.CMS SPRINT-A Scholars Program for Research INTernship, DOE, \$40000.00, 2023–2024, **PI**
- USCMS Common Projects, DOE/Fermilab, \$45360.00, 2020–2023, **PI**
- LHC Physics Center, DOE/Fermilab, \$107800.00, 2023, **PI**

- High Energy Physics Research: Experimental & Theoretical, DOE, \$4,100,000.00, 2023–2025, **co-PI** w/ Profs. Dasu, Black, Herndon:
- USCMS Software & Computing, DOE/Fermilab, \$343,572.00, 2021–2024, **co-PI** w/ Prof Dasu:

Teaching:

- UW-Madison:
 - PHY107 (Ideas of Modern Physics, 2 times);
 - PHY 207 (General Physics, 6 times);
 - PHY 301 (Physics Today, once);
- Boston University:
 - PY212 (General Physics II, 3 times);
 - PY551 (Introduction to Particle Physics, 4 times);
 - PY898 (Special Topics in Experimental Physics: LHC Physics, once);

Graduate Advisor: Evans, Hal (Indiana U.);

Postdoctoral Sponsors: Cutts, Dave (Brown U.), Landsberg, Greg (Brown U.).

Advisees:

Postdoctoral (4 total):

- Koraka, Charis: 2021-current (UW);
- Pinna, Deborah: 2018-current (UW);
- Avetisyan, Aram: 2011-2017 (Imagine Software);
- Carrera, Edgar: 2009-2010 (faculty at National Polytechnic School, Ecuador).

Graduate Students (10 total):

- Chavez, Elise (UW);
- Nelson, Trevor (UW);
- Parida, Ganesh (UW);
- Shang, Victor (UW);
- Thakore, Mitanshu (UW);
- Loeliger, Andrew: PhD 2022 (postdoc at Princeton);
- Rankin, Dylan: PhD 2018 (faculty at University of Pennsylvania);
- Richardson, Clint: PhD 2017 (Tamr);

- Fantasia, Cory: PhD 2014 (Ab Initio);
- Sperka, David: PhD 2014 (faculty at Boston University).

Undergraduate (10 total):

- UW-Madison: Roderick, Jenna Marie; Talbi, Nadia; Petruska, Eloise; Venkatasubramaniam, Nikhilesh (now student at Brown), Silveus, Matthew
- Boston University: Bouchamaoui, Hichem (Princeton Univ.); Cheung, Elim (Univ. of Maryland); Dimitriyev, Michael (Florida Tech.); Lewin, Sylvia (Berkeley); Necib, Lina (faculty at MIT).

Recent Invited Presentations, Colloquia and Seminars:

- Colloquium, Indiana University, March 2024
- Invited seminar, Colliders of Tomorrow, Fermilab, Dec 2023
- Invited talk, Leon Lederman Seminar Series, Universidad de Guanajuato, Guatemala, June 2023
- Invited talk, "CMS Physics", Meenakshi Narain Memorial Symposium, Fermilab, March 2023
- Invited talk, "Recent LHC Results", PHENO 2021, May 2021
- Invited talk, "Existing ATLAS and CMS Anomalies", Kavli Institute for Theoretical Physics, UC Santa Barbara, May 2021
- Invited talk, "Recent LHC Dark Sector Results", TeVPA2021, October 2021
- Invited seminar, "Breaking boundaries at the Energy Frontier in the search for new physics", October 2020
- Colloquium, University of Toronto, November 2019
- Invited seminar, "Searching for new physics at CMS – with precision and innovation", Joint Theoretical-Experimental Physics Seminar, Fermilab, August 2019.
- LHC Experimental Summary and Outlook, Aspen 2019 Winter Conference, March 2019
- Moriond QCD Experimental Summary, Recontres du Moriond, La Thuile, Italy, March 2018.

Outreach:

- Advisory Board member for Symmetry Magazine (2020 – present)
- Co-organizer of U.S. CMS - PURSUE (Program for Undergraduate Research SUMmer Experience) <https://inspirehep.net/literature/2154635> (2022-present)
- "Effective Collaboration in Research", expert panel member, Nature Masterclasses <https://masterclasses.nature.com/online-course-effective-collaboration-in-research/17078834>
- "The unseen progress of the LHC", Symmetry magazine article, May 2019 <https://www.symmetrymagazine.org/article/the-unseen-progress-of-the-lhc>

- “Into the darkness”, video interview on HBO/Vice, March 2017 <https://www.youtube.com/watch?v=Ky1YTEDYkCw>
- “Cosmic Connections BU”, outreach event organized at the Boston University Physics Department for middle school students (Science Solstice program), December 2016.
- “The 2016 Large Hadron Collider Update”, interview for Science for the public, Nov. 7th, 2016 <http://www.scienceforthepublic.org/cosmos/the-2016-large-hadron-collider-update/>
- “How to design an experiment for the LHC”, interview for Discovery News, June 23rd 2016, <http://www.seeker.com/how-to-design-an-experiment-for-the-lhc-1878142241.html/>
- “What’s up at the Large Hadron Collider”, public lecture at the Robbins Library, Arlington sponsored by Science for the Public, October 27, 2015: <http://www.forum-network.org/lectures/whats-2015-large-hadron-collider/>
- “Cosmic Connections BU”, outreach event organized at the Boston University Physics Department for high school seniors and juniors, Spring 2015: <http://www.bu.edu/cas/2015/03/23/cosmic-connectionsbu-shows-students-a-day-in-the-life-of-a-physicist/>
- “Great Expectations: The Large Hadron Collider 2015”, video interview for Science for the Public program “Contemporary Science Issues and Innovations”, November 5, 2014: <http://www.scienceforthepublic.org/cosmos/great-expectations-the-large-hadron-collider-2015>.
- Help organize and participate in activities coordinated through the Boston University Undergraduate Physics Society, Women in Physics and the Women in Science and Engineering society (2008 – 2018).
- Participate in the Summer Pathways program organized at Boston University for high school women students (2010 – 2018).
- Organized an LHC outreach event as part of “Physics Day” aimed at Boston-area public school students (2010).
- Interact with journalists, science writers and film makers to help disseminate information about high energy physics research to a broader audience (2006–Present).
Featured in a series of short documentary films directed by Liz Mermin: “CERN people”.
BBC interview during the startup of the LHC 7 TeV run (March 30th, 2010):
Interview and Symmetry magazine article: <http://www.symmetrymagazine.org/breaking/2010/06/24/cms-exotica-hotline-leads-hunt-for-exotic-particles/>;
Fermilab Today CMS Result of the month article: http://www.fnal.gov/pub/today/archive_2011/today11-08-12_HeavyCousinsReadMore.html;