

# TULIKA BOSE

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## Professional Preparation:

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

## Professional Appointments:

- Associate Professor, Physics Department, Boston University (since May 2015)
- Assistant Professor, Physics Department, Boston University (September 2008 – April 2015)
- Post-doctoral Research Associate, Brown University (2006 – 2008)
- Graduate Research Assistant, Columbia University (1998 – 2005)

## Awards:

- **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-convenor 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  $\approx 5000$  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, organisation 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.

- **Hind Rattan (Jewel of India) Award:** Chosen by the Non-Resident Society of India to receive the 2015 Hind Rattan Award on January 25th, 2015 for “outstanding services, achievements and contributions for keeping the Flag of India high”.
- **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)**

#### Professional Service:

- **Leadership Positions:**
  - Appointed CMS Physics Co-coordinator (2017 – 2019)
  - CMS Beyond 2 Generations (B2G) physics group co-convener (2016 – 2017)
  - CMS Trigger Coordinator (2014 – 2016)
  - Elected by the U.S. CMS collaboration to serve as the U.S. CMS Physics Liaison (2013 – 2014);
  - Co-convener of the Resonances group within the CMS Beyond Two Generations (B2G) physics analysis group (2012 – August 2014);
  - CMS Deputy Trigger Coordinator (2011 – March 2013);
  - Member of the CMS Exotica/B2G Publication Committee (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 is 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:**
  - Elected member of the 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:**

Served as reviewer for:

- Department of Energy
- Physics Letters B
- Journal of High Energy Physics
- Cambridge University Press
- Netherlands Organisation for Scientific Research (NWO, the Dutch research council).

- **Conference/workshop Organization:**

- Co-convenor of “Higgs and Electroweak Symmetry Breaking” sessions at the 2017 DPF meeting, July 2017.
- Co-convenor 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-convenor 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.

- **Outreach:**

- “Into the darkness”, video interview on HBO/Vice, March 2017.
- “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>
- 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 – present).
- Participate in the Summer Pathways program organized at Boston University for high school women students (2010 – present).
- 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): [http://www.bbc.co.uk/worldservice/news/2010/03/100330\\_mcgrath\\_bose1\\_nh\\_sl.shtml](http://www.bbc.co.uk/worldservice/news/2010/03/100330_mcgrath_bose1_nh_sl.shtml);  
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](http://www.fnal.gov/pub/today/archive_2011/today11-08-12_HeavyCousinsReadMore.html);

### Selected publications:

I have a total of 935 publications. The full list is available at [http://inspirehep.net/search?ln=en&ln=en&p=find+a+bose%2C+t+AND+collection%3Aciteable&of=hb&action\\_search=Search&sf=&so=d&rm=&rg=250&sc=0](http://inspirehep.net/search?ln=en&ln=en&p=find+a+bose%2C+t+AND+collection%3Aciteable&of=hb&action_search=Search&sf=&so=d&rm=&rg=250&sc=0). Some selected publications to which I have made several key contributions are given below:

- CMS Collaboration, “Search for single production of a heavy vector-like T quark decaying to a Higgs boson and a top quark with a lepton and jets in the final state”, Submitted to Phys. Lett. B, arXiv:1612.00999.
- CMS Collaboraion, “Search for massive resonances decaying into WW, WZ or ZZ bosons in proton-proton collisions at  $\sqrt{s}=13$  TeV”, arXiv:1612.0915.
- CMS Collaboration, “Search for single production of vector-like quarks decaying to a Z boson and a top or a bottom quark in proton-proton collisions at  $\sqrt{s}=13$  TeV”, arXiv:1701.07409.
- CMS Collaboration, “The CMS Trigger system”, JINST 12 (2017) no.01, P01020, arXiv:1609.02366 [physics.ins-det].
- CMS Collaboration, “Search for W’ to tb in proton-proton collisions at  $\sqrt{s} = 8$  TeV”, arXiv:1509.06051 [hep-ex].
- CMS Collaboration, “Search for monotop signatures in proton-proton collisions at  $\sqrt{s}=8$  TeV”, Phys. Rev. Lett. 114 (2015) 10, 101801.

- CMS Collaboration, “Search for new resonances decaying via WZ to leptons in protonproton collisions at  $\sqrt{s}= 8$  TeV”, Phys. Lett. B 740 (2015) 83.
- CMS Collaboration, “Search for pair production of excited top quarks in the lepton+jets final state”, JHEP 06 125 (2014).
- CMS Collaboration, “Search for W’ to tb decays in the lepton + jets final state in pp collisions at  $\sqrt{s} = 8$  TeV, JHEP 05 108 (2014).
- 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, “Inclusive search for a vector-like T quark with charge 2/3 in pp collisions at  $\sqrt{s} = 8$  TeV”, Phys. Lett. B 729 149 (2014).
- CMS Collaboration, “Searches for long-lived charged particles in pp collisions at  $\sqrt{s} = 7$  and 8 TeV”, JHEP 07, 122 2013.
- CMS Collaboration, “Searches for new physics using the  $t\bar{t}$  invariant mass distribution in pp collisions at  $\sqrt{s}=8$  TeV”, Phys. Rev. Lett. 111 (2013) 211804.
- CMS Collaboration, “Search for a Higgs boson decaying into a Z and a photon in pp collisions at  $\sqrt{s} = 7$  and 8 TeV”, Phys. Lett. B 726 (2013) 587.
- CMS Collaboration, “Search for a W’ boson decaying to a bottom quark and a top quark in  $pp$  collisions at  $\sqrt{s} = 7$  TeV”, Phys. Lett. B 718 (2013) 1229.
- 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.
- CMS Collaboration, “Combined results of searches for the standard model Higgs boson in  $pp$  collisions at  $\sqrt{s} = 7$  TeV”, Phys. Lett. B 710 (2012) 26.
- CMS Collaboration, “Search for a  $W'$  or Techni- $\rho$  Decaying into  $WZ$  in  $pp$  Collisions at  $\sqrt{s} = 7$  TeV”, Phys. Rev. Lett 109 (2012) 071803.
- CMS Collaboration, “Search for a W’ boson decaying to a muon and a neutrino in pp collisions at  $\sqrt{s} = 7$  TeV”, Phys. Lett. B 701 (2011) 160.
- CMS Collaboration, “Search for Heavy Stable Charged Particles in  $pp$  collisions at  $\sqrt{s} = 7$  TeV”, JHEP 03, 024, 2011.
- CMS Collaboration, “Commissioning of the CMS High-Level Trigger with Cosmic Rays”, JINST 5:T03005, 2010.
- L. Agostino et al., “Commissioning of the CMS High Level Trigger”, JINST 4:P10005, 2009.
- D0 Collaboration, “Search for Long-Lived Charged Massive Particles with the D0 Detector”, Phys. Rev. Lett. 102 (2009) 161802.
- D0 Collaboration, “Search for  $W'$  Boson Resonances Decaying to a Top Quark and a Bottom Quark”, Phys. Rev. Lett. 100 (2008) 211803.
- D0 Collaboration, “The Upgraded D0 detector”, Nucl. Instrum. Meth. A 565 (2006) 463.

- D0 Collaboration, “First direct two-sided bound on the  $B_s^0$  oscillation frequency”, Phys. Rev. Lett. 97 (2006) 021802.