

# 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:

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

## Awards:

- **Appointed Trigger Coordinator of the Compact Muon Solenoid (CMS) Experiment for a two year term starting September 2014:** 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:**

- Elected by the U.S. CMS collaboration to serve as the U.S. CMS Physics Liaison (2013 – present);
- Co-convener of the Resonances group within the CMS Beyond Two Generations (B2G) physics analysis group (2012 – present);
- CMS Deputy Trigger Coordinator (2011 – March 2013);
- Member of the CMS Exotica/B2G Publication Committee (2013 – present);
- 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:**

- Member of the U.S. LHC Users Association Executive Committee (2014 – 2016);
- 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-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.

• **Outreach:**

- 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);

## Recent Presentations and Talks:

### Conference Talks:

- “Searches for non-resonant new phenomena at the Tevatron and LHC”, plenary talk presented at LHCP 2013: Large Hadron Collider Physics Conference, Barcelona, Spain, 13th May 2013.
- “Searches for technicolor at the LHC”, invited plenary talk at the Lattice Meets Experiment workshop, University of Colorado, Boulder, 26th October, 2012.
- “Review of LHC Summer2012 results”, Fermilab Wine & Cheese: Fermilab Joint Experimental-Theoretical Seminar (In conjunction with HCP Summer School), Fermilab, Batavia, August 17th, 2012.
- “Searches with top quarks at the LHC (ATLAS+CMS)”, plenary talk at BSMVietNam: Beyond The Standard Model of Particle Physics, International Centre for Scientific Research and Education, Quy Nhn (Viet Nam), July 15th, 2012.
- “Recent Results from CMS”, plenary talk at 45th Annual Fermilab Users’ Meeting, Fermilab, Batavia, IL, June 12th, 2012.
- “Search for W’ bosons at CMS”, talk at the Meeting of the Division of Particles and Fields of the American Physical Society (DPF 2011), Providence, August 12th, 2011.
- “Dibosons at CMS”, plenary talk at Hadron Collider Physics Symposium (HCP 2011), Paris, November 15th, 2011.
- “Status of the CMS Experiment and First Results”, plenary talk at LHC@Brookhaven Joint Theory/Experiment Workshop on Early Physics at the LHC, Brookhaven National Laboratory, February 8th, 2010.
- “Direct and Indirect Probes for New Heavy Fermions at D0”, plenary talk at Second Workshop on Beyond 3 Generation Standard Model, Taipei, Taiwan, January 16th, 2010.

- “Prospects for Searches for New Heavy Quarks with CMS”, plenary talk at Second Workshop on Beyond 3 Generation Standard Model, Taipei, Taiwan, January 16th, 2010.
- “Experimental prospects for strong dynamics at the LHC”, invited talk at the Lattice Gauge Theory for LHC Physics workshop, Boston, November 6th, 2009.
- “Review of Analysis Techniques in High Energy Physics”, International Conference of Computational Methods in Sciences and Engineering (ICCMSE 2009), Rhodes, Greece, September 30th, 2009.
- “Status of the CMS Experiment”, invited talk at US LHC Users Meeting at Lawrence Berkeley National Lab, Berkeley, September 26th, 2009.
- “Exotic searches with complex final states”, invited talk at the Meeting of the Division of Particles and Fields of the American Physical Society (DPF 2009), Detroit, July 31st, 2009.

#### **Colloquia/Seminars:**

- “The Discovery of a new boson at the LHC”, Colloquium at Boston University, together with Kevin Black, September 11th, 2012.
- “Searches for new heavy gauge bosons at CMS”, Seminar at University of Massachusetts, Amherst, May 4th, 2012.
- “Triggering on Exotica with the CMS Detector”, Colloquium at University of Alabama, April 12th, 2010.
- “The Large Hadron Collider Startup: the exotic journey begins”, Colloquium at Northeastern University, April 8th, 2010.
- “Triggering on Exotica with the CMS Detector”, Seminar at Harvard University, Cambridge, October 21st, 2009.
- “Triggering on Exotica with the CMS Experiment”, Colloquium at Northwestern University, Evanston, October 16th, 2009.
- “Search for charged massive stable particles at D0”, Seminar at University of Wisconsin-Madison, Madison, February 16th, 2009.
- “Status of the CMS Experiment”, Seminar at University of Chicago, November 3rd, 2008.

#### **Other Talks/ Panel discussions:**

- “Overview of U.S. CMS Physics Activities and Support”, invited talk at U.S. CMS Operations Review, Columbia University, New York, March 19th, 2014.
- “Physics at the LHC”, invited lecture to high school students, Summer Pathways, Boston University, July 2013.
- American Physical Society (APS) 2011 March meeting, Panel member: “Experiences and Issues for Young Physicists in the International Arena: Impact on the Future of Physics”, Detroit, March 25th, 2011.
- American Physical Society (APS) 2011 March meeting, invited talk: “Perspectives from an International Female Physicist in Academia”, Detroit, March 25th, 2011.

- “Women in Physics Lunch forum” Meeting of the Division of Particles and Fields of the American Physical Society, DPF 2011 roundtable, Providence, Aug 12th, 2011.
- “Angels and Demons at the LHC”, Summer Pathways, Boston University, July 12th, 2010.
- “Physics in Collision at the Large Hadron Collider”, Physics Day, Boston University, May 12th, 2010
- “A journey in search for new physics: from India to the LHC”, invited talk at the Boston University Women in Physics Luncheon, May 27th, 2009.

#### Media Productions:

- “Equal and Opposite Forces”, interview for Boston University 2014 Research Magazine, <http://www.bu.edu/research/magazine/2013/dialogues/equal-opposite-forces/index.shtml>.
- Interview/film production for Boston University Abroad program, May 2013.
- Interview/film production for Boston University Admissions, January 2013.
- “CERN people films”: Part of a documentary feature project for Films of Record, directed by Liz Mermin. The film crew followed a handful of people from CERN over a period of one year documenting their work/progress.
- “Dark Matter and Supersymmetry”, BBC interview, March 30th, 2010.

#### Selected publications:

I have a total of 661 publications of which 611 have been published in refereed journals. The full list is available at [http://inspirehep.net/search?ln=en&ln=en&p=find+a+bose%2C+t&of=hb&action\\_search=Search&sf=&so=d&rm=&rg=100&sc=0](http://inspirehep.net/search?ln=en&ln=en&p=find+a+bose%2C+t&of=hb&action_search=Search&sf=&so=d&rm=&rg=100&sc=0). Some selected publications to which I have made key contributions are given below:

- CMS Collaboration, “Search for  $W$  to  $t\bar{b}$  decays in the lepton + jets final state in  $pp$  collisions at  $\sqrt{s} = 8$  TeV”, arXiv:1402.2176, accepted by JHEP.
- CMS Collaboration, “Search for top-quark partners with charge  $5/3$  in the same-sign dilepton final state”, arXiv:1312.2391, accepted by Phys. Rev. Lett.
- 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.