

DR. SUNIL BANSAL

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UIET, Panjab University
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POSITIONS

Assistant Professor (Physics) <i>UIET, Panjab University, Chandigarh, India</i>	<i>2014 - Present</i>
DST Inspire Faculty <i>UIET, Panjab University, Chandigarh, India</i>	<i>2014 - Present</i>
PostDoctoral Fellow (CMS Experiment) <i>University of Antwerpen, Antwerpen, Belgium</i>	<i>2011 - 2014</i>
Visiting Scientist (CMS Experiment) <i>FNAL, Chicago, USA</i>	<i>Feb 2010 - June 2010</i>

EDUCATION

Doctorate of Philosophy (Ph.D.) in Experiment High Energy Physics <i>Panjab University, Chandigarh, India</i>	<i>2006 - 2010</i>
Master of Science (M. Sc.) Hons. Physics with Specialization in Electronics 82% <i>Panjab University, Chandigarh, India</i>	<i>2004 - 2006</i>
Bechalar of Science (B. Sc.) 79% <i>FGM College (Kurukshetra University), Haryana, India</i>	<i>2001 - 2004</i>

RESEARCH FIELD

Experiment High Energy Physics

RESEARCH COLLABORATION

CMS Collaboration, CERN, Geneva	<i>2006-present</i>
DUNE Collaboration, FNAL, USA	<i>2015-present</i>

RESEARCH PROJECTS

- Compact Muon Solenoid (CMS) Upgrade, Operation and Utilization** by DST, duration 2016-2019, Research Grant Rs. 58 lakhs.
- Study of the Higgs properties and multiple parton interactions using CMS experiment at the Large Hadron**, DST Inspire Faculty Award, duration 2014-2019, Research Grant Rs. 35 lakhs.
- Study of High PT Particle Production from Multiple Parton Scattering**, UGC Start-up Award, duration 2017-2019, Research Grant Rs. 6 lakhs.

MANAGEMENT RESPONSIBILITIES IN CMS COLLABORATION

L3 convener of Soft QCD and MPI/Small-x subgroup of FSQ PAG	<i>Sept. 2015 - March 2017</i>
L3 convener of Soft QCD and MPI of FSQ PAG	<i>Jan. 2013 - Jan. 2014</i>
Trigger Contact of FSQ PAG	<i>Jan. 2011 - Jan. 2013</i>
Member of Analysis Review Committee of CMS Collaboration <i>PLB 735, Pages 204-225, CMS-PAS-TOP-15-017</i> <i>CMS-PAS-SMP-16-014</i>	<i>2012 - present</i>

RESEARCH SUPERVISION

Ph.D. (completed)	0
Ph.D. (ongoing)	3
Project student (ongoing)	2
Master (ongoing)	0
Master (completed)	1

ACADEMIC/SCIENTIFIC SOCIETIES

Member of IAB of International Workshop on MPI@LHC	2017 - Present
Member of Indian Association of Physics Teachers	2015 - Present

AWARDS

DST INSPIRE Faculty Award, India	2014
Senior Research Fellow (SRF), CSIR-India	2008 - 2010
Junior Research Fellow (JRF), CSIR-India	2006 - 2008
National Eligibility Test (NET-CSIR), India	2005
Graduate Aptitude Test in Engineering (GATE) AIR-100, India	2006
Joint Entrance Screening Test (JEST) AIR-29, India	2006

LIST OF SELECTED PUBLICATIONS

- S. Bansal et. al, “New observables for multiple-parton interactions measurements using Z+jets processes at the LHC”, *Phys. Rev. D* **93** (2016) no.5, 054019 , 2016.
- CMS Collaboration, “Measurement of the underlying event using the Drell-Yan process in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *CMS Physics Analysis Summary CMS-PAS-FSQ-16-008*, 2016.
- CMS Collaboration, “Observation of the rare $B_s^0 \rightarrow \mu^+ \mu^-$ decay from the combined analysis of CMS and LHCb data”, *Nature* **522**, 68-72, 2015.
- CMS Collaboration, “Underlying Event Measurements with Leading Particles and Jets in pp collisions at $\sqrt{s} = 13$ TeV”, *CMS Physics Analysis Summary CMS-PAS-FSQ-15-007*, 2015.
- CMS Collaboration, “Evidence for the direct decay of the 125 GeV Higgs boson to fermions”, *Nature Physics* **10**, 557-560, 2014.
- CMS Collaboration, “Performance of quark/gluon discrimination using pp collision data at $\sqrt{s} = 8$ TeV”, *CMS Physics Analysis Summary CMS-PAS-JME-13-002*, 2013.
- CMS Collaboration, “Search for the standard model Higgs boson produced through vector boson fusion and decaying to $b\bar{b}$ ”, *Phys. Rev. D* **92**, 032008, 2014.
- CMS Collaboration, “Study of double parton scattering using W + 2-jet events in proton-proton collisions at $\sqrt{s} = 7$ TeV”, *JHEP* **03** (2014) 032, 2014
- CMS Collaboration, “A New Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider”, *Science*, Vol. 338, Issue 6114, pp. 1569-1575, 2012.
- CMS Collaboration, “Measurement of the underlying event in the Drell-Yan process in proton- proton collisions at $\sqrt{s} = 7$ TeV”, *Eur. Phys. J. C* **72** (2012) 2080, 2010.
- CMS Collaboration, “Measurement of the underlying event activity at the LHC with $\sqrt{s} = 7$ TeV and comparison with $\sqrt{s} = 0.9$ TeV”, *J. High Energy Phys.* **09**, 109, 2011.
- CMS Collaboration, “Measurement of the underlying event activity in proton-proton collisions at 0.9 TeV”, *Eur. Phys. J. C* **70**, 555, 2010.
- CMS Collaboration, “Performance of the CMS Level-1 Trigger during Commissioning with Cosmic Ray Muons and LHC beams”, *J. Instrum.* **5** (2010) T03002, 2010.

S. Bansal et. al, “Measurement of $Z \rightarrow \tau\tau \rightarrow e\mu$ inclusive process at Large Hadron Collider”, *PRAMANA Journal of Physics*, Vol. 75, No. 3, pp. 439-448, 2010.

S. Bansal et. al, “Search for invisibly decaying Higgs boson at Large Hadron Collider”, *PRAMANA Journal of Physics*, Vol. 74, No. 2, pp. 231-246, 2010.

CONFERENCE/WORKSHOP/SYMPOSIUM PRESENTATIONS AND EXTENSION LECTURES

Underlying Event Measurements @ LHC, *invited talk in Discussion meeting on Jets@LHC 21-28 Feb. 2017, ICTS, Bangalore, India.*

Study of Multiple Partonic Interactions at the Large Hadron Collider, *poster presentation in XXII DAE High Energy Physics Symposium, Delhi University, 12- 16 December 2016, India.*

Expert Lectures on “Collider Physics”, *28-29 April and 5-6 May 2016, DAV College, Sector 10, Chandigarh, India*

Evolution of multiple parton interactions with the centre-of-mass energy of hadron collisions, *poster presentation, 10th CHASCON 29 Feb. - 2 March 2016, Chandigarh, India.*

Discriminator for Quark and Gluon Jets for CMS Experiment, *poster presentation, 9th CHASCON 25-27 Feb 2015, Chandigarh, India.*

Study of the multiple parton interactions using CMS detector, *invited talk at IISER Mohali, 2 September 2014, India.*

Study of the multiple parton interactions using CMS detector, *invited talk at TIFR Mumbai, 3 March 2014, India.*

Measurement of double parton scatterings in W + 2-jet events with the CMS detector *planery talk at MPI@LHC 2013, 2-6 December 2013, Antwerp, Belgium.*

Recent CMS results on soft QCD and multi-parton interactions, *plenary talk at LOW X 2012, 27-30 June, 2012, Cyprus.*

Underlying event, minimum bias and forward energy flow measurements with CMS”, *plenary talk at MPI 2011, 21-25 November 2011, Germany.*

Measurement of Underlying Events using Drell-Yan Process, *poster presentation at EPS-HEP 2011, 21-27 July 2011, France.*

Particle-level-corrected UE data from CMS, *plenary talk at MBUEWG 2011, 17 June 2011, Switzerland.*

Search for Invisible Higgs in CMS, *poster presentation at HCP 2009, 16-20 November 2009, France.*

Search for invisible Higgs at CMS, *parallel talk at XVIII DAE HEP symposium, December 2008, Varanasi, India.*

CONFERENCE PROCEEDINGS

Assembly and characterization of gaseous particle detector: Resistive plate chambers, DOI: 10.1109/RAECS.2015.7453365.

Study of the Double Parton Scattering via W + 2-Jet Process Using the CMS Detector at LHC, DOI: 10.1007978-3-319-25619-1.23.

Underlying event, minimum bias and forward energy flow measurements with CMS, DOI:
10.3204/DESY-PROC-2012-03/2.

Measurement of the underlying event activity in the Drell-Yan process in proton-proton
collisions at $\sqrt{s} = 7$ TeV, PoS EPS-HEP2011 (2011) 445.

Search for invisible Higgs in CMS, PoS HCP2009 (2009) 063.

CONFERENCE/WORKSHOP/SYMPOSIUM/ACADEMIC EVENTS ATTENDED

International Conference in Nuclear Physics with Energetic Heavy Ion beams <i>PU, Chandigarh, India</i>	<i>15-18 March 2017</i>
Faculty Development Programme on Effective Teaching <i>UIET, PU, Chandigarh, India</i>	<i>9-14 January 2017</i>
XXII DAE-BRNS HEP Symposium <i>DU, Delhi, India</i>	<i>12-16 December 2016</i>
10th CASCON <i>PU, Chandigarh, India</i>	<i>29 Feb-2 March 2016</i>
72nd Refresher course in experimental physics <i>PU, Chandigarh, India</i>	<i>16 June -1 July 2015</i>
Workshop on High Performance Computing <i>PU, Chandigarh, India</i>	<i>16-17 March 2015</i>
9th CASCON <i>PU, Chandigarh, India</i>	<i>25-27 Feb. 2015</i>
Workshop on Multi-Parton Interactions at the LHC <i>Antwerp, Belgium</i>	<i>2-6 December 2013</i>
LOW X 2012 worksop <i>Paphos, Cyprus</i>	<i>27-30 June 2012</i>
Workshop on Multi-Parton Interactions at the LHC <i>Hamburg, Germany</i>	<i>21-25 November 2011</i>
International Europhysics Conference on High Energy Physics <i>Grenoble, France</i>	<i>21-27 July 2011</i>
Minimum Bias and underlying event working group meeting <i>Geneva, Switzerland</i>	<i>17 June 2011</i>
XXth Hadron Collider Physics Symposium <i>Evian, France</i>	<i>16-20 November 2009</i>
LHC Physics Workshop <i>TIFR, Mumbai, India</i>	<i>21-27 October 2009</i>
3rd Linear Collider Physics School <i>The University of Cumbria Ambleside campus, UK</i>	<i>17-23 August 2009</i>
VII SERC school on Experimental High Energy <i>IIT, Mumbai, India</i>	<i>9-27 Feb. 2009</i>
XVIII DAE-BRNS High Energy Physics Symposium <i>BHU, Valanasi, India</i>	<i>14-18 December 2008</i>
CTEQ - MCnet Summer School <i>Debrecen, Hungary</i>	<i>8-16 August 2008</i>
LHC08: Early Physics at LHC with CMS Detector <i>TIFR, Mumbai, India</i>	<i>26-29 March 2008</i>
IX International Workshop on RPC and Related Detectors <i>TIFR, Mumbai, India</i>	<i>13-16 Feb. 2008</i>
Topical Meeting on Physics at the LHC <i>HRI, Allahabad, India</i>	<i>16-22 December 2006</i>
EU-IndiaGrid Workshop <i>TIFR, Mumbai, India</i>	<i>1-4 December 2006</i>
Workshop on LHC Physics <i>TIFR, Mumbai, India</i>	<i>4-8 September 2006</i>