

CV: Prof. Bedangadas Mohanty

Name : Bedangadas Mohanty
Affiliation : National Institute of Science Education and Research Bhubaneswar
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Telephone : +918895584872
Nationality : Indian
Date of Birth : 8th April 1973
Date of Degree of PhD : July 2002
Discipline : Physical Science
Field of Specialization : Experimental High Energy Physics

Employment History:

S.N	Period	Employer	Designation
1	January 2004 to July 2008	Variable Energy Cyclotron Centre, Kolkata	Scientific Officer-D
2	August 2008 to June 2012	Variable Energy Cyclotron Centre, Kolkata	Scientific Officer-E
3.	August 2009 – July 2012	Homi Bhabha National Institute, Mumbai	Assistant Professor
4.	July 2012 – June 2016	Homi Bhabha National Institute, Mumbai	Associate Professor
5.	August 2016 till date	Homi Bhabha National Institute, Mumbai	Professor
6.	June 2012 – June 2016	National Institute of Science Education and Research, Bhubaneswar	Associate Professor
7.	July 2016 – till date	National Institute of Science Education and Research, Bhubaneswar	Professor

Educational Qualification:

S.N	Degree	Institute/University	Year	Specialization	Division
1	B.Sc	Utkal University	1994	Physics	1 st (Best Graduate)
2	M.Sc	Utkal University	1996	Physics	1 st (Gold Medalist)
3	PhD	Institute of Physics	2002	Experimental High Energy Physics	Awarded best thesis by Indian Physics Association
4	Post-Doc	Variable Energy Cyclotron Centre, Kolkata	2002-03	Experimental High Energy Physics	Department of Atomic Energy K. S. Krishnan Fellow
		Lawrence Berkeley National Laboratory	2006-07		Offered Staff position - Declined

Awards and Recognitions:

- Year 2017: Awarded Prestigious **J C Bose National Fellow**, Department of Science and Technology, Govt of India, New Delhi
- Year 2017: Elected **Fellow of National Academy of Sciences India (NASI)**, Allahabad
- Year 2017: Elected **Fellow of Indian Academy of Sciences (IAS)**, Bangalore
- Year 2017: Awarded **Utkalmani Yuva Prativa Samman-2017 in the field of Education** by 'The Samaja', a Premier Odia Daily.
- Year 2017: **Editor of International Journal of Modern Physics E** (World Scientific Publishing)
- Year 2016: Elected **Fellow of Indian National Science Academy (INSA) New Delhi** (effective from 1st January 2017) *Citation: For his influential contributions and leadership in the international STAR collaboration on the phase diagram of strongly interacting nuclear matter and for his collaborative work with theorists to help pinpoint the critical point of this phase diagram from experimental measurements of heavy ion collisions.*
- Year 2015: **Shanti Swarup Bhatnagar Prize (Highest scientific prize in India)**. *Citation: For his outstanding contributions and leadership role in determining the QCD crossover temperature, a fundamental parameter of strong interaction physics and discovery of the heaviest anti-matter nuclei, with implications for the fields of nuclear physics, astrophysics and cosmology.*
- Year 2014 Onwards: Elected member of Editorial Board ALICE experimental at the Large Hadron Collider Facility, CERN, Geneva.
- Year 2011-2014 : Deputy Spokesperson STAR Experiment at Relativistic Heavy Ion Collider Facility at Brookhaven National Laboratory, New York, USA
- Year 2010-2011 : **SwarnaJayanti Fellowship**- Department of Science and Technology, Govt. of India.
- Year 2010: Outstanding Research Investigator award- **DAE-Science Research Council Fellowship**- Govt. of India. (Council Membership: Prof. C. N. R Rao, Prof. P. Rama Rao, Prof. R. Chidambaram, Prof. Obaid Siddiqui, Dr. R. Grover, AEC Chairman and Director BARC)
- Year 2008-2011 : Physics Coordinator STAR Experiment, Brookhaven National Laboratory, New York, USA
- Year 2006 : Young Scientist award – Department of Atomic Energy, Govt of India
- Year 2003: **Associate of Indian Science Academy**, Bangalore
- Year 2003: **INSA Young Scientist Medal** – Indian National Science Academy, New Delhi
- Year 2002: Best thesis award in nuclear physics, Indian Physics Association.
- Year 2002: Dr. K.S. Krishnan Fellowship – Department of Atomic Energy and Board of Research in Nuclear Sciences, Govt. of India (*At that time the highest paid RA position in India*)
- Year 1997: L.K. Panda Award, Institute of Physics, Bhubaneswar
- Year 1997: Junior Research Fellowship in Physical Sciences, by CSIR New Delhi and eligibility for lectureship by UGC, New Delhi
- Year 1996: **University Gold Medal**, Utkal University, Bhubaneswar
- Year 1994: Best Graduate Trophy for all streams in Bachelor program, Utkal University

Supervised 6 PhD students for degree:

1. Md. Nasim, Currently postdoctoral fellow at UCLA, USA
2. Chitrasen Jena, postdoctoral fellow at University of Padova, Italy, and then **Faculty at Indian Institute of Science Education Research, Tirupati**
3. Ranbir Singh, visiting scientist at University of Catania, Italy and then **Scientist at NISER**

4. Subhash Singha, postdoctoral fellowship at KSU, USA stationed at BNL, USA.
5. Md. Rihan Haque, postdoctoral fellow at University of Utrecht, Netherlands
6. Sabita Das, postdoctoral fellow at CCNU, Wuhan, China

Supervised Masters Thesis for six students:

1. Ms. Roli Esha, currently graduate student at UCLA, USA (*Best MSc Thesis Award*)
2. Mr. Evan John Phillip, currently graduate student at University of Stony Brook, USA
3. Mr. Arabinda Behera, currently graduate student at University of Stony Brook, USA (*Best MSc Thesis Award*)
4. Mr. Himangshu Neog, currently graduate student at Texas A&M University, USA
5. Mr. Amit Nanda, offered graduate studentship at SUNY, Purdue and University of Minnesota, USA
6. Mr. Rohith Saradhy, currently graduate student at University of Minnesota, USA

Supervised 9 Postdoctoral Fellows:

1. Dr. Victor Roy, Postdoctoral Fellow 2012, then was Alexander von Humboldt fellow FIAS, Frankfurt, Germany, currently **Faculty at NISER**
2. Dr. Anirban Lahari, Postdoctoral Fellow 2013, Currently Postdoctoral Fellow at TIFR, Mumbai
3. Dr. Sandeep Chatterjee, Postdoctoral Fellow 2014, Currently Postdoctoral Fellow at Warsaw
4. Dr. Sabyasachi Ghosh, Postdoctoral Fellow 2015, Currently D. S. Kothari Fellow at University of Calcutta
5. Dr. Ajay Dash, Postdoctoral Fellow since 2015
6. Dr. Purba Bhattacharya Postdoctoral Fellow 2015, Currently Postdoctoral Fellow at Weisemann Institute.
7. Dr. Meghna K K Postdoctoral Fellow since 2016
8. Dr. Ram Chandra Baral, Postdoctoral Fellow since 2017
9. Dr. Subhasis Samanta, Postdoctoral Fellow science 2017

Teaching:

Teaches undergraduate at NISER, Bhubaneswar, core courses of Quantum Mechanics, Nuclear and Particle physics, Relativity, Laboratory courses related to Modern Physics, Nuclear Physics, Solid State Physics and Optics, has been lecturer at various international schools abroad (Tokyo Institute of Technology, **Japan**, Institute of Particle Physics, Wuhan, **China** and **Peking University, China**) and **SERC schools** (SERC School in theoretical high energy physics, SERC schools in experimental high energy physics) in India.

Academic/Scientific/Administrative Positions

Currently:

1. Member INDIA-CERN Task Force set up by DAE and DST to monitor all aspects of Indian participation at CERN
2. Member Institutional Advisory Board/Departmental Advisory Board, NCERT, New Delhi
3. Member Board of Studies for Physical Sciences, HBNI, Mumbai (Demmed University)
4. Member Senate of IISER, Berhampur
5. Member Board of Governors, NISER
6. Chairperson, School of Physical Sciences, NISER (Since 2013)
7. Dean of Faculty Affairs, NISER (Since 2013)
8. Member STAR Experiment Council, BNL, USA (Since 2012)
9. Member Collaboration Board, ALICE, LHC, CERN (Since 2013)
10. Member ALICE experiment Editorial Board, LHC, CERN (Since 2014)
11. Member of Council of Super CDMS (Dark Matter experiment) (Since 2015)
12. Member Subject Research Committee of P.G. Department of Physics, Utkal University (Since 2012)

13. Member Academic Council, NISER (Since 2012)
14. Member Committee on Formulation of Academic Master Plan for Second Campus of Ravenshaw University
15. Life member of Indian Physics Association; Member of American Physical Society; Member of National Academy of Sciences, India.
16. Member Planning Committee of Experimental High Energy Physics SERC Schools, Department of Science and Technology, Govt. of India (Since 2015).
17. Member of Committee to evaluate the institutional developmental plans for higher education in Odisha, Govt. Of Odisha and World Bank joint program.

Previously:

1. Deputy Spokesperson, STAR Experiment, BNL USA (2011-2014).
2. Physics Analysis Coordinator, STAR Experiment, BNL, USA (2008-2011).
3. Co-convenor of Spectra Physics Working Group, STAR Experiment, BNL, USA (2006-2008).
4. Coordinator ALICE-India light flavour spectra group and Chair ALICE-India Physics Analysis task force
5. Chairman Post Graduate Council of Schools, NISER
6. Member Disciplinary Action Committee, NISER
7. Member of STAR Experiment Decadal Plan Committees for future physics prospects and programs of STAR at RHIC, BNL, USA.
8. Member of 2009/2010 RHIC & AGS Users Executive Committee, BNL, USA
9. Member STAR Beam User Request Preparation committee in the years 2008, 2009 and 2010.
10. STAR Trigger Board in the year 2008, 2009 and 2010 and STAR By-laws committee
11. Presented the case of high energy nuclear physics in DAE-DST Vision Meeting of Nuclear, Particle and High Energy Physics (Long range plan), August 2014.

Organizing or Advisory Committee Member of Conferences (Selected list):

1. Director SERC School on Experimental High Energy Physics, NISER, November 7 – 27, 2017
2. International Advisory Committee Member Strangeness in Quark Matter, "Strangeness in Quark Matter", Utrecht, Netherlands from July 10 – 15, 2017
3. International Advisory Committee Member Strangeness in Quark Matter, "Strangeness in Quark Matter", UC Berkeley Clark Kerr Campus, Berkeley, USA from June 27 – July 1, 2016
4. International Advisory Committee Member Asian Triangular Heavy-Ion Conference, New Delhi 15-19 February 2016
5. International Advisory Committee Member Strangeness in Quark Matter, "Strangeness in Quark Matter", Dubna, July 6-11, 2015.
6. Member of International Program Committee for the international conference on "Heavy ion collisions in the LHC era", Qui Nhon, in central Vietnam, 27th - 31st July, 2015
7. International Advisory Committee Member Strangeness in Quark Matter, Birmingham (SQM2013) - July 22-27 2013.
8. Organizing Committee Member National Meeting on Physics of Heavy Flavour - HF India Meet 2013 IIT, Mumbai, 29-Apr to 01-May-2013
9. Member National Organizing Committee DAE HEP Symposium, Shantiniketan, January 13-19, 2013.
10. Member of International Program Committee for the international conference on "Heavy ion collisions in the LHC era", Qui Nhon, in central Vietnam, 15th - 21st July, 2012.
11. International Advisory Committee Member for Asian Triangular Heavy Ion Conference, Pusan, Korea, 7 - 10th November 2012.
12. Co-ordinator Non-perturbative Strong Interaction Physics, Workshop on High Energy Physics Phenomenology XII, Mahabaleswar 02 - 15 January, 2012.

13. International Advisory Committee Member for The 40th (XL) edition of the International Symposium on Multiparticle Dynamics will be held in Antwerp, Belgium, 21-25, September 2010.
14. Organizing Committee Member of the 6th International Conference on Physics and Astrophysics of Quark Gluon Plasma, Goa, (ICPAQGP 2010), December 5 - 10, 2010.
15. Scientific secretary and Organizing Committee member of Understanding the Universe through LHC on 28 February, 2009 an outreach program, held at VECC/SINP, Kolkata, India.
16. Organizing Committee member, 20th International Conference on Ultra- relativistic Heavy ion Collisions (Quark Matter 2008), Jaipur, India, February, 2008.
17. Co-ordinator QCD-QGP working group WHEPPX, Xth WORKSHOP ON HIGH ENERGY PHYSICS PHENOMENOLOGY (WHEPP-X), Institute of Mathematical Sciences (IMSc), Chennai, India, from Jan 2-13, 2008.
18. Organizing Committee member of BRNS Workshop on Quark Gluon Plasma (QGP Meet 2006), Kolkata, India, February 5-7, 2006.
19. Scientific secretary and Organizing Committee member of the 5th International conference on physics and astrophysics of quark gluon plasma, Kolkata, India, February 8-12, 2005.

Selection Committee, Referee and Examiner (Selected list):

1. Referee for the Physical Review Letters, Physical Review, Physics Letters B, Modern Physics Letters, Journal of Physics G, Current Science and Pramana journals.
2. **Project Reviewer:** Veni grant in the Innovational Research Incentives Scheme, **Netherlands Organisation for Scientific Research**, Hague, Netherlands
3. **Project reviewer:** Lise Meitner-Postdoctoral -position received by the **Austrian Science Fund**, Vienna, Austria
4. **Project Reviewer: Office of Nuclear Physics (NP) within the Department of Energy Office of Science, USA (evaluated research projects for grants received from MSU, LANL, Purdue University etc)**
5. **Project Reviewer** of grant proposal for **National Science Centre in the OPUS funding scheme, Poland Project Reviewer** of grant proposal for **National Science Centre in the OPUS funding scheme, Poland**
6. **Referee for Shanti Swarup Bhatnagar Prize, CSIR, Govt. of India**
7. Ph. D Thesis Examiner at IIT, Calcutta UNiversity and Utkal University, MSc examiner Sambalpur University
8. Member of interview board for Kishore Vaignanik Protsahan Yojana program since 2012
9. Faculty selection committee member at Institute of Physics, Bhubaneswar, IIIT, Bhubaneswar, IISER, Tirupati, IIT Bhubaneswar and NISER, Bhubaneswar. Promotion committee member at NISER, Bhubaneswar
10. Selection committee of pre-doctoral students at IOP, Bhubaneswar, VECC, Kolkata and NISER, Bhubaneswar
11. Reviewer of Tsinghua University, China 221 Program Evaluation
12. Evaluator of seed money grant proposal, IIT, Bhubaneswar
13. Member of Selection Committee for Rahul Basu memorial best thesis award in the area of high-energy physics since 2012.
14. Member on Committee for Academic Master Plan of second campus of Ravenshaw University

Invited Talks Selected (*talks in the highest conference in the field):

Sl. No	Invited Talk/Session Chair	Conference/Workshop/Symposium/Institute	Place	Date
65.	Hadron Resonance Gas Model, Fluctuations and the QCD Phase Diagram	International EMMI Workshop on Critical Fluctuations near QCD Phase Boundary in	Wuhan, China	October 10-15, 2017

		Relativistic Nuclear Collisions		
64.	The Phase Diagram of QCD (Colloquium)	Indian Institute of Technology, Madras	Chennai, India	18 th January 2017
63.	Freeze-out dynamics in heavy-ion collisions	Strangeness in Quark Matter	UC Berkeley Clark Kerr Campus, Berkeley, USA	June 27 – July 1, 2016
62.	De-confined state of quarks and gluons – Quark Gluon Plasma (Colloquium)	NSF Colloquium Tata Institute of Fundamental research	Mumbai, India	4 th May 2016
61.	New form of Matter: De-confined state of Quarks and Gluons	TIFR Centre for Interdisciplinary Sciences	Hyderabad, India	28 th April 2016
60.	New form of Matter: De-confined state of Quarks and Gluons (Colloquium)	International Centre for Theoretical Studies (ICTS)	Bangalore, India	18 th April 2016
59.	Phases of QCD	Indian Institute of Technology Bombay	Mumbai, India	9 th April 2016
58.	New form of Matter: De-confined state of Quarks and Gluons	Indian Institute of Science Education and Research	Kolkata, India	5 th March 2016
57.	New form of Matter: De-confined state of Quarks and Gluons (Colloquium)	Saha Institute of Nuclear Physics	Kolkata, India	24 th February 2016
56.	Physics of Relativistic Heavy-Ion Collisions	6 th Asian Triangular Heavy Ion Conference	New Delhi	February 15-19, 2016
55.	Freeze-out Dynamics at RHIC Beam Energy Scan Program	Strongly Interacting Hot and Dense Matter: Theory and Experiment	GSI, Darmstadt, Germany	November 2-6, 2015
54.	Search for Critical Point in QCD phase Diagram	13 th international eXtreme QCD (XQCD)	Central China Normal University (CCNU), Wuhan, China	September 21-23, 2015
53.	Freeze-out dynamics in high energy heavy-ion collisions	Discussion Meeting on High Moment of Net-charge, Net-Kaon and Net-protons in High-Energy Nuclear Collisions	Lawrence Berkeley National Laboratory, Berkeley USA	June 22-24, 2015
52.	Search for QCD Critical Point and Beam Energy Scan	7 th International Conference on Physics and Astrophysics of Quark Gluon Plasma (ICPAQGP-2015)	VECC/SINP Kolkata, India	February 2-6, 2015
51.	Exploring the QCD phase diagram through high energy nuclear collisions at RHIC	QCD at High Density	TIFR, Mumbai, India	January 27-30, 2015
50.	Experimental Overview of the QCD Phase Diagram	5 th Asian Triangle Heavy Ion Conference (ATHIC) 2014	Osaka University, Japan	August 5 - 8, 2014
49.	Baselines for high moment analysis to study QCD Phase Diagram	Topical Meeting on High Moment Analysis in High Energy Nuclear Collisions	Central China Normal University,	July 10 - 16, 2014.

			Wuhan, China	
48.	Study of QCD phase structure through high energy heavy-ion collisions	New Frontiers in QCD 2013, Yukawa Institute of Theoretical Physics	Kyoto, Japan	November 18 - December 20, 2013
47.	Exploring the QCD phase structure through relativistic heavy-ion collisions	International Symposium on Nuclear Physics	Mumbai, India	December 2-6, 2013.
46.	A new state of matter in relativistic heavy-ion collisions	Workshop on High Energy Physics and Phenomenology, WHEPP13	Puri, India	December 12-21, 2013
45.	Exploring the QCD phase structure through relativistic heavy-ion collisions	International Nuclear Physics Conference	Frienze, Italy	June 2-7, 2013
44.	High Energy Nuclear Collisions and Phase Diagram of strong interactions	National Conference on Nuclear Physics, NCNP 2013	Sambalpur, India	March 01-03, 2013
43.	QCD Phase Diagram, An Overview	8th International Workshop on Critical Point and Onset of Deconfinement, CPOD 2013	Nappa Valley, CA, USA	March 11-15, 2013
42.	Results from the Beam Energy Scan Program at RHIC	EMMI Workshop	GSI, Darmstadt, Germany	February 15, 2013
41.	Phi-meson production a probe for de-confinement transition in high energy heavy-ion collisions	Lawrence Berkeley National Laboratory	Berkeley, USA	December 4, 2012
40.	Summary of RHIC results and future directions	University of California, Los Angeles	Los Angeles, USA	December 3, 2012
39.	Beam Energy Scan Program at RHIC	Asian Triangle Heavy Ion Conference 2012	Haeundae, Pusan, South Korea	November 14, 2012
38.	Relativistic Heavy Ion Collider Experiments: What have we learned?	QGP-Meet 2012	Variable Energy Cyclotron Center, Kolkata, India	July 3, 2012
37.	Results from the Relativistic Heavy Ion Collider	DAE-BRNS Symposium on Nuclear Physics	Andhra University, Vishakhapatana m, India	December 26-30, 2011
36.	Studying the QCD phase diagram using conserved number distributions in high energy collisions	7th International Workshop on Critical Point and Onset of Deconfinement	Institute of Particle Physics (CCNU), China	7-11 November 2011
35. *	STAR experiment results from the beam energy scan program at RHIC	XXII International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2011)	Anney, France	23-28 May 2011

34.	Possible evidence for thermalization at RHIC	The Phase Diagram of QCD - Bring your own	Tata Institute Of Fundamental Research, Mumbai, India	December 13 - 14, 2010
33.	Exploring the QCD landscape with high-energy nuclear collisions	2010 Annual Fall Meeting of the APS Division of Nuclear Physics	Convention Center in downtown Santa Fe, NM, USA	November 2-6, 2010
32.	QCD Critical Point	Third Asian Triangle Heavy-Ion Conference (ATHIC 2010)	Institute of Particle Physics, Central China (Hua-Zhong) Normal University, Wuhan, China	October 18-20, 2010
31.	Search for the QCD Critical Point	QCD IN THE MEDIUM	Department of Physics, University of Calcutta, India	4 - 6 October 2010.
30.	Experimental study of the QCD phase diagram using high energy nuclear collisions	Strong Interactions in the 21st Century	Tata Institute Of Fundamental Research, Mumbai, India	February 10 - 12, 2010
29.	Current status of Thermalization from available STAR results	Workshop on critical point, fluctuations and thermalization	Jammu University, Jammu (Patnitop), India	17th Sept to 19th Sept, 2009
28.	Experimental study of the QCD phase diagram and search for the critical point at RHIC	Free Meson Seminar	Tata Institute of Fundamental Research, Mumbai, India	June 23, 2009
27.	Search for the QCD Critical Point Through Study Of Higher Moments Of E-by-ENet-Proton Distributions	Heavy Ion Tea Seminar	Lawrence Berkeley National Laboratory, Berkeley, USA	April 14, 2009
26. *	Phase transitions, Fluctuations and Correlations	21st International conference on nucleus-nucleus collisions at ultrarelativistic energies, QM2009	Knoxville, USA	March 30 - April 4, 2009
25.	New Results from Relativistic Heavy Ion Collider	Homi Bhabha Centenary DAE-BRNS Symposium on High Energy Physics 2008	Varanasi, India	14-18 December 2008
24.	Probe the QCD phase diagram with phi-mesons in high energy nuclear collisions	Strange Quark Matter 2008	Beijing, China	6-10 October 2008
23. *	STAR results on medium properties and response of medium to highly energetic partons	20th International conference on ultra relativistic nucleus-nucleus collisions, QM2008	Jaipur, India	February 4-10, 2008

22.	Search for the color factor effect at RHIC	International Symposium on Multiparticle Dynamics	LBL, Berkeley, USA	August 4-9, 2007
21.	Search for Effects of the QCD Color Factor in High-Energy Collisions at RHIC	Nuclear Science Division Special Seminar	Lawrence Berkeley National Laboratory, Berkeley, USA	May 29, 2007
20.	Effect of color charge dependence on energy loss at RHIC	23rd Winter workshop on nuclear dynamics (WWND07)	Big Sky, Montana, USA	February 12-18, 2007
19. *	Properties of particle production at large transverse momentum in Au+Au and Cu+Cu collisions at RHIC	Quark Matter 2006, 19th International Conference on Ultra-relativistic Nucleus-Nucleus Collisions	Shanghai, China	November, 2006
18.	A view on present and vision for future	VECC Foundation Day Celebration, R and D Activities at VECC - Present and Future	Kolkata, India	June 16, 2006
17.	Experimental results from forward rapidity at RHIC	QGP MEET 2006	Kolkata, India	February 6, 2006
16.	Results from STAR experiment at RHIC	9th Workshop on High Energy Physics Phenomenology(WHEPP-9)	Bhubaneswar, India	January 3-14, 2006
15.	Results from the Relativistic Heavy Ion Collider	50th DAE-BRNS International Symposium on Nuclear Physics	Mumbai, India	December 12-16, 2005
14.	Results on transverse momentum spectra in p+p and d+Au collisions from STAR experiment at RHIC	47th Workshop on Physics of Hadronic Interaction at LHC with Nucleons and Nuclei and Phase Transition Physics and "The 1st physics ALICE week"	Erice, Italy	December 2-10, 2005
13.	Identified hadron spectra at large transverse momentum in p+p and d+Au at 200 GeV	Brookhaven National Laboratory Nuclear Physics Seminar	Brookhaven National Laboratory, USA	November 22, 2005
12.	Particle production in p+p, d+Au and Au+Au collisions at RHIC	Lawrence Berkeley National Laboratory Nuclear Physics Seminar	Lawrence Berkeley National Laboratory, USA	November 17, 2005
11.	First results from Photon Multiplicity Detector at RHIC	5th International conference on physics and astrophysics of quark-gluon plasma	Kolkata, India	February 8-12, 2005
10. *	Particle Production at forward rapidity in d+Au and Au+Au collisions	Quark Matter 2005, 18th International Conference on Ultra-relativistic Nucleus-Nucleus Collisions	Budapest, Hungary	August 4, 2005
9.	Photon and charged particle multiplicity	Wayne State University	Detroit, USA	February 2003

	fluctuation and correlation in 158 AGeV/c Pb on Pb collisions			
8.	Disoriented Chiral Condensates: Experimental Review	QGP Meet 2004	Institute of Physics, Bhubaneswar, India	October 2004
7.	Fluctuations and QCD Phase transitions	QGP Meet 2003	Variable Energy Cyclotron Centre, Kolkata, India	May 2003
6.*	Particle Density Fluctuations	XVI International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions (Quark Matter 2002)	Nantes, France	July 17-24, 2002
5.	Some interesting results from high energy heavy-ion collision experiments	Alumni and Foundation day of the Institute of Physics.	Institute of Physics, Bhubaneswar, India	September 3-4, 2002
4.	Fluctuation in photon and charged particle multiplicities at SPS and it's prospect at RHIC and LHC	DAE-BRNS symposium on nuclear physics	SINP/VECC Kolkata, India	December 26-30, 2001
3.	Photon multiplicity detector : From SPS to RHIC and LHC	International conference on physics and astrophysics of quark-gluon plasma	Jaipur, India	November 26-30, 2001
2.	Localized charged-neutral fluctuations in 158 A GeVPb + Pb collisions	CERN Heavy Ion Forum "on Event-by-event physics	CERN, Geneva, Switzerland	June 21-22 2001
1.	Search for disoriented chiral condensates in 158.A GeVPb+Pb collisions in WA98 experiment	Relativistic heavy-ion physics (RHIP'99). Hot and dense matter	Prague, Czech republic	August 30 - 3 September, 1999

Top 10+ Publications

Authors	Year	Title	Journal	Vol.	Page	Citations and Impact Factor (IF)	Remark
S. Gupta, X. Luo, B. Mohanty H. Ritter N. Xu	2011	Scale for the Phase Diagram Of Quantum Chromodynamics	Science	332	1525	145 and 31 (IF)	Corresponding author
STAR Collaboration	2011	Observation of Anti-matter Helium-4 nucleus	Nature	473	353	79 and 38.6 (IF)	Part of PhD Thesis of my student and head of the Paper Committee

	2010	Observation of An antimatter hypernucleus	Science	328	58	126 and 31 (IF)	Physics Analysis Leader
STAR Collaboration	2014	Energy Dependence Of Moments of net Proton Distributions At RHIC	Physical Review Letters	112	0323 02	197 and 7.9 (IF)	Corresponding author and primary author
		Beam Energy Dependence of moments of the net charge multiplicity distributions in Au+Au collisions at RHIC		113	0923 01	142 and 7.9(IF)	
	2010	Higher Moments Of net-proton Multiplicity Distributions at RHIC		105	0223 02	210 and 7.9 (IF)	
STAR Collaboration	2016	Centrality and Transverse momentum dependence of elliptic flow of multi-strange hadrons and phi-meson in Au+Au collisions at 200 GeV	Physical Review Letters	116	0623 01	17 and 7.9(IF)	Primary Author
	2013	Observation of an Energy-dependent Difference in Elliptic flow Between particles And anti-particles		110	1423 01	51 and 7.9 (IF)	

		In relativistic Heavy ion collisions					
STAR Collaboration	2009	Energy and System Size Dependence of Phi meson Production in Cu+Cu and Au+Au collisions	Physics Letters B	673	183	80 and 4.5 (IF)	Primary Author and Corresponding author
STAR Collaboration	2007	Energy Dependence of pi+/-, p and pbar transverse momentum spectra in Au+Au collisions at 62.4 and 200 GeV	Physics Letters B	655	104	174 and 4.5 (IF)	Primary Author and Corresponding author
STAR Collaboration	2006	Identified hadron Spectra at large Transverse Momentum in p+p and d+Au collisions at 200 GeV	Physics Letters B	637	161	255 and 4.5 (IF)	Primary Author and Corresponding author
B. Mohanty J. Serreau	2005	Disoriented Chiral Condensates: Theory and Experiment	Physics Reports	414	263	40 and 22.9 (IF)	First author
STAR Collaboration	2005	Multiplicity and Pseudorapidity Distributions of Photons in Au+Au collisions at 62.4 GeV	Physical Review Letters	95	062301	51 and 7.9 (IF)	Primary Author and Corresponding author ONLY PRL from India Detector in Heavy-ion experiments
STAR Collaboration	2005	Experimental and Theoretical Challenges in the Search for the	Nuclear Physics A	757	102	2480 and 1.5 (IF)	Several of my analysis results are part of this white paper

		Quark gluon Plasma: The STAR Collaboration's critical assessment of the evidence from the RHIC collisions					
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- Complete list of publication separately attached.

Project and Grants:

Particulars	Title of the Project	Period	Funding Agency	Amount (Rs)
Current Funding	1. QCD phase structure and nuclei production in accelerators and in the cosmos	2010-2016	DAE-BRNS	99,75,000
	2. Study of QCD matter in high energy heavy-ion collisions	2012-2017	DST	98,00,000
	3. Experimental High Energy Physics at NISER	2012-2019	DAE	150,00,000
	4. Beam Energy Scan program with Relativistic Heavy Ion Collisions and development of a Gas based Detector facility at NISER	2015-2018	SERB/DST	39,00,000
	5. CEFIPRA – Indo-French (joint project)	2016-2018	CEFIPRA	108KEuros
Proposals Pending	Dark Matter Search Experiment at NISER (Approved by DAE)	2016-2019	DAE	600,00,000

Institutions visited for research collaboration – long duration (selected list):

Institution	Year
CERN, Geneva, Switzerland	1998 – 2016 (several times)
Brookhaven National Laboratory, Upton New York, USA	2000-2016 (several times)
Lawrence Berkeley National Laboratory, Berkeley, USA	2006-2016 (several times)
Yukawa Institute of Theoretical Physics, Kyoto and University of Tokyo, Osaka University, Japan	2014, 2010, 2014
GSI, Darmstadt, Germany	2013, 2014, 2015
Institute of Particle Physics, Wuhan China	2011, 2012, 2014, 2015

Outreach and Science Popularization:

1. "STAR experiment reports the discovery of anti-strange matter" – CURRENT SCIENCE, VOL. 99, NO. 7, 10 OCTOBER 2010, Page 873 .
2. "STAR experiment launches the QCD Critical Point Search Program at the Relativistic Heavy Ion Collider facility" – CURRENT SCIENCE, VOL. 100, NO. 5, 10 MARCH 2011, Page 618.
3. "STAR Experiment reports observation of the antimatter helium-4 nucleus" – CURRENT SCIENCE, VOL. 100, NO. 11, 10 June 2011, Page 1613 .
4. "Formation of a perfect fluid in high-energy heavy-ion collisions" – CURRENT SCIENCE, VOL. 103, NO. 11, December 2011, Page 1267 .
5. "Properties of a system of fundamental constituents of visible matter" – CURRENT SCIENCE, VOL. 106, NO. 6, March 2014, Page 798 .
6. Scientific secretary and Organizing Committee member of Understanding the Universe through LHC on 28 February, 2009 an outreach program, held at VECC/SINP, Kolkata, India.
7. Several Popular physics talks in INSPIRE INTERSHIP PROGRAM FOR YOUNG TALENTS (2012, 2013, 2014, 2015, 2016) Sponsored by: Department of Science and Technology (DST), Govt. Of India
8. Mentor to several summer students selected by Indian Academy of Sciences.

Description of the work

- **The strong interactions are** one of the four basic interactions that occur in nature. The phase diagram tells us how matter organizes itself when subject to variations in thermodynamic parameters and it is a key to **understanding the emergent properties of Quantum Chromodynamics (QCD)**. While phase diagrams of systems of atoms and molecules interacting via the electromagnetic interaction have been very widely studied and precisely known (e.g water), that for the strong interactions had remained a conjecture for a long time. Dr. Mohanty has significantly contributed towards the establishment of the Phase Diagram of QCD.
- (a) Has led the physics program of a dedicated experiment at Brookhaven National Laboratory for the purpose of studying phase diagram of QCD called the "Beam Energy Scan Program".
 - (b) Has contributed to the establishment of the quark-hadron transition and its transition temperature. This work is published in **Science 332 (2011) 1525** and "Physics World" considered it among the 10 best in the year 2011.
 - (c) His work has recently led to an exciting possibility of the existence of a critical point in the phase diagram of QCD. We have established the observable for the critical point search in the experiment, published in **Phys.Rev.Lett. 105 (2010) 022302**. This is considered as a landmark work in the field. Then, based on the first data of the beam energy scan program, we wrote an experimental paper that showed that the possible critical point region of the QCD phase diagram is near the beam energy of 20 GeV (temperature ~ 160 MeV and baryonic chemical potential ~ 400 MeV). This work is published in **Physical Review Letters 112 (2014) 032302**. Has very successfully led the beam energy scan physics program to publish so far **5 important scientific papers in Physical Review Letters**.
- **Contribution to establishing the formation of a new phase of matter**, the Quark Gluon Plasma (QGP) in the laboratory. This state of matter existed in the first few microsecond old Universe. In such matter, quarks and gluons are de-confined and move freely in volumes much larger than nucleonic scales. In order to achieve such matter in the laboratory, temperatures of the order of 10^{12} degrees Kelvin need to be created. The quark-gluon plasma allows for studying transport properties like viscosity, thermal conductivity, opacity and diffusion co-efficient of QCD matter. Has several significant papers on signatures that experimentally confirm the existence of QGP, related to observation of strangeness enhancement in heavy-ion collisions – **Phys.Lett.B 673**

(2009) 183, jet quenching effect - **PRL 97 (2006) 152301** and **Physics Letters B 655 (2007) 104, 637 (2006) 161** and partonic collectivity - **PRL 116 (2016) 062301**; **PRL 99 (2007) 112301**. These are summarized in a review paper in **Nucl. Phys. A 757 (2005) 102**. They support the formation of a QGP that exhibits perfect fluidity (viscosity to entropy density ratio close to the quantum bound). These papers have a total citations of about **2400**.

- ***The discovery of two new anti-matter nuclei.***

(a) As the physics analysis leader has led a team that discovered the heaviest known anti-matter nuclei the **anti-alpha** (consisting of two anti-protons and two anti-neutrons) in the laboratory. The discovery is published in **Nature 473 (2011) 353**. This measurement provided the probability of production of anti-helium through nuclear interactions, thereby providing the predominant baseline for measurements carried out in space.

(b) As the physics analysis leader has led a team that discovered the heaviest strange anti-matter nuclei. Normal nuclei are formed only of protons and neutrons. Hyper-nuclei are made up of protons, neutrons and hyperons. The **anti-hypertriton**, nuclei consists of anti-proton, anti-neutron and anti-lambda (a strange hadron). This work is published in **Science 328 (2010) 58**. It has implications for neutron stars and also understanding of the nuclear force. To study nuclei, scientists arrange the various nuclides into a two-dimensional table of nuclides. On one axis is the number of neutrons N , and on the other is the number of protons Z . The discovery of antihyperon introduces a third axis (strangeness) and the table becomes three-dimensional.

- ***Disoriented Chiral Condensates (DCC) and Chiral Phase Transition.*** J. D.Bjorken, F. Wilczek and collaborators have advocated the existence of DCC due to chiral phase transitions in QCD matter. The possibility of producing quark-gluon plasma in high-energy collisions is an exciting one from the point of view of observing the chiral phase transition as the hot plasma expands and cools. As the system returns to its normal phase it is possible for regions of misaligned vacuum to be produced. These domains, which are analogous to misaligned domains of a ferromagnet have been named Disoriented Chiral Condensates (DCCs). DCC's are regions where the chiral field is partially aligned in a isospin direction. These domains relax back to ground state configuration by emitting pions of a particular species. Towards this goal, and since a neutral pion readily decays to photons, has put in several years of dedicated efforts from to **establish photon production in heavy-ion collisions using a detector built in India** and search for the signature of the chiral phase transition (through DCC). He was the lead author of the Physical Review Letters paper on inclusive photon production in heavy-ion collisions (**PRL-95 (2005) 062301**) using the Indian detector. His contribution to photon production and to the physics of DCC in heavy-ion collisions led to the invitation from the editorial board of Physics Reports to write a review article, published as - **Phys. Rept. 414 (2005) 263** titled "Disoriented Chiral Condensate - Theory and Experiment".

- ***Impact of the contributions:***

- (a) His work has contributed to the experimental confirmation of the formation of the Quark Gluon Plasma. This has enabled the study of properties of QCD matter like viscosity, conductivity, diffusion co-efficient and opacity.
- (b) His work has led towards the phase diagram of QCD becoming a reality: transition temperature, order of transition and two different phases have been established at zero baryonic chemical potential. The possibility of the existence of a critical point is the seen in data.
- (c) The discovery of anti-alpha and anti-hypertriton, have implications in the fields of cosmology, astro-particle physics and nuclear physics.

He has been invited to deliver plenary talks at important conferences in the field (Quark

Matter and Strange Quark Matter) and he has given the conference summary talk on “phase transitions, critical point and correlations” at Quark Matter 2009. Within India his scientific work has been recognized through the award of the CSIR **Shanti Swarup Bhatnagar Prize** (highest scientific honor in India for scientists below the age of 45 years) and the DST **Swarna Jayanti Award** ((highest scientific honor in India for scientists below the age of 40 years). He has been elected as the fellow of the **Two National Academics of Sciences** (INSA, New Delhi and IAS, Bangalore) in India.

Citation for Highest Scientific Award of India as signed by the Prime Minister of India: reads: “*For his outstanding contributions and leadership role in determining the QCD crossover temperature, a fundamental parameter of strong interaction physics and discovery of the heaviest anti-matter nuclei, with implications for the fields of nuclear physics, astrophysics and cosmology.*”

Citation for the election as Fellow of India Academy reads: “*For his influential contributions and leadership in the international STAR collaboration on the phase diagram of strongly interacting nuclear matter and for his collaborative work with theorists to help pinpoint the critical point of this phase diagram from experimental measurements of heavy ion collisions.*”

Statement regarding his contribution to Nuclear Physics Program in USA:

The research work and other scientific contributions of Dr. Mohanty as made significant contribution to Nuclear Physics Program in USA.

- (a) As STAR Experiment, Deputy Spokesperson, from year 2011 to 2014. He has been involved in all decisions related to the experiment running and physics program at RHIC, BNL, USA. This includes preparation of Beam User Proposals for PAC, Decadal Plan Program for the experiment, Future Physics Possibilities of the experiment, Physics Analysis Direction etc. Has presented the RHIC Science Case in various International Forums.
- (b) As STAR Experiment, Physics Analysis Co-ordinator, from year 2008 to 2011. His primary responsibility is to manage the physics activities of STAR experiment at the Relativistic Heavy Ion Collider Facility, at Brookhaven National Laboratory, USA (<http://www.star.bnl.gov/>). Further to guide the various analysis being carried out and to give new ideas and direction for future analysis projects. Several new analysis directions were formulated during this period. STAR published 13 Physical Review Letters, One Nature, One Science paper and 35 other publications mostly Physical Review C. 51 students got their PhD from the STAR experiment during this period. 440 Physics Talks were given by STAR Collaborators during this period.
- (c) Convener of the STAR Physics Working Group, for years 2006-2008. Primary responsibility is to manage the physics activities of particle spectra working group in STAR experiment at the Relativistic Heavy Ion Collider Facility, at Brookhaven National Laboratory, USA. Several high impact papers were published which includes about 6 Physical Review Letters.
- (d) Member of the STAR Talks Committee, for year 2006-2008. Primary responsibility is to advise the Spokesperson and/or choose a suitable candidate among themore than 400 physicists in the STAR experiment, to present its most important and new results at various conferences/symposiums/meetings.
- (e) Executive Member of RHIC Users Committee at BNL
- (f) Supervised directly 6 Masters student who are pursuing their PhD in USA Universities
- (g) Supervised directly 3 PhD students who are helping the USA Science Nuclear Program as Postdoctoral Fellows.
- (h) Has reviewed several DOE NP proposals and APS journal papers.

Statement regarding his contribution to Nuclear Physics Program in Europe:

- (a) He was the lead author of the Technical Design Report and the Addendum to the technical design report for the Photon Multiplicity Detector put in the ALICE

experiment at LHC, CERN. A key person in the team for successful data taking by the detector and has guided the 1st PhD student who analysed the 1st data taken by the detector and successfully published it.

- (b) Did his PhD in the WA98 experiment at CERN and published 4 papers out of a total of 21 papers from the collaboration with 100 members and 20 institutes world wide.
- (c) As Editorial Board Member of ALICE at CERN contributes towards the physics program of the experiment
- (d) As member of the collaboration board of ALICE at CERN contributes towards the running of the experiment and help in decision making at the highest forum of the experiment.
- (e) Supervised masters, phd and postdoctoral fellows who work for various experiments at LHC, CERN.

Papers	Citations
<i>Top 6 most cited primary author papers</i>	
Experimental and theoretical challenges in the search for the quark gluon plasma: Nucl.Phys.A757:102,2005	2480
Identified baryon and meson distributions at large transverse momenta from Au+Au collisions at $\sqrt{s_{NN}} = 200$ -GeV: Phys.Rev.Lett.97:152301,2006	295
Identified hadron spectra at large transverse momentum in p+p and d+Au collisions at $\sqrt{s_{NN}} = 200$ -GeV: Phys.Lett.B637:161-169,2006	255
Higher Moments of Net-Proton Multiplicity Distribution at RHIC: Phys.Rev.Lett. 105:022302, 2010	210
Energy Dependence of High Moments of Net-Proton Distributions at RHIC. Phys. Rev. Lett. 112 (2014) 032302	211
Energy dependence of pi, p and pbar transverse momentum spectra for Au+Au collisions at $\sqrt{s_{NN}} = 62.4$ and 200 GeV: Phys.Lett.B655:104, 2007	174
Scale for the Phase Diagram of QCD, Science 332 (2011)1525	145
All publications	39,485
All Experimental publications (WA98, STAR and ALICE experiments)	38,369
All Non-Experimental paper (Phenomenology, simulations)	1130
<i>Citation summary</i>	
<i>Citations</i>	<i>Number of papers</i>
500+	12
250-499	20
100-249	75

H-index: 103 – INSPIRE and 106 Google Scholar

Editorial: Theme Issue on Hot and Dense matter: Edited by Bedangadas Mohanty and Sourendu Gupta, Pramana, 84 (2015) 669-941

<http://www.ias.ac.in/listing/articles/pram/084/05>

Outreach and Science Popularization

1. "STAR experiment reports the discovery of anti-strange matter" – CURRENT SCIENCE, VOL. 99, NO. 7, 10 OCTOBER 2010, Page 873 .
http://www.currentscience.ac.in/Downloads/download_pdf.php?titleid=id_099_07_0873_0874_0
2. "STAR experiment launches the QCD Critical Point Search Program at the Relativistic Heavy Ion Collider facility" – CURRENT SCIENCE, VOL. 100, NO. 5, 10 MARCH 2011, Page 618.
<http://www.currentscience.ac.in/Volumes/100/05/0618.pdf>
3. "STAR Experiment reports observation of the antimatter helium-4 nucleus" – CURRENT SCIENCE, VOL. 100, NO. 11, 10 June 2011, Page 1613 .
<http://www.currentscience.ac.in/Volumes/100/11/1613.pdf>
4. "Formation of a perfect fluid in high-energy heavy-ion collisions" – CURRENT SCIENCE, VOL. 103, NO. 11, December 2011, Page 1267 .
<http://www.currentscience.ac.in/Volumes/103/11/1267.pdf>
5. "Properties of a system of fundamental constituents of visible matter" – CURRENT SCIENCE, VOL. 106, NO. 6, March 2014, Page 798 .
<http://www.currentscience.ac.in/Volumes/106/06/0798.pdf>
6. Scientific secretary and Organizing Committee member of Understanding the Universe through LHC on 28 February, 2009 an outreach program, held at VECC/SINP, Kolkata, India.
7. Several Popular physics talks in INSPIRE INTERSHIP PROGRAM FOR YOUNG TALENTS (2012, 2013, 2014, 2015, 2016) Sponsored by: Department of Science and Technology (DST), Govt. Of India
8. Mentor to several summer students selected by Indian Academy of Sciences.
9. Conduct Science Day Activities in NISER