




Faculty Details proforma for DU Web-site

Title	Dr.	First Name	Mohammad	Last Name	Naimuddin	Photograph
Designation	Associate Professor					
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Educational Qualifications						
Degree	Institution				Year	
Ph.D.	Delhi University				2006	
M.Sc. (Physics)	Delhi University				2002	
Career Profile						
<p>Associate Professor, University of Delhi, Delhi, India (2018 - till date) Assistant Professor, University of Delhi, Delhi, India (2009- 2018) Scientific Associate, European Center for Nuclear Research (CERN), Geneva, Switzerland (2017-2018) Adjunct Professor, Northern Illinois University, DeKalb, IL, USA (2010 – 2016) Research Associate, Fermi National Accelerator Lab, Batavia, IL, USA (2006-2009) Research Assistant, Fermi National Accelerator Lab, Batavia, IL, USA (2004-2006) Junior Research Fellow, CSIR, New Delhi, India (2003-2004)</p>						
Administrative Assignments						
<p>Resident Tutor, Jubilee Hall, University of Delhi, Delhi, India (2009 – 2021) Director, Xth SERC School in Experimental High Energy Physics, 2016 Member, Department of Science and Technology Program Committee for conducting SERC Schools in High energy physics. (2015-2020) Deputy Project Manager, CMS GEM Project, CERN, Geneva (2017 – till date) Convener, Model Independent search group, DZERO experiment, Fermilab (2007-2012) Coordinator, Global Monitoring System, DZERO experiment, Fermilab (2005-2007) Member of the various Departmental Committees and University committees.</p>						

Areas of Interest / Specialization

High Energy Particle Physics, Nuclear Physics, Medical physics
Higgs Searches, Searches for New Physics beyond Standard Model, B physics, Neutrino physics.
Application of HEP elements in medical physics for cancer therapy.
Software and algorithm development for HEP, Detector development
Presently collaborating on CMS experiment at LHC-CERN and INO experiment, India.

Subjects Taught

Quantum Mechanics (M.Sc.)
Classical Mechanics (M. Sc.)
Nuclear and Particle Physics Theory (M.Sc.)
Advance Numerical Techniques (M.Sc.)
Nuclear and Computational Sciences (M.Tech.)
Nuclear Physics Practicals (M.Sc.)
Computational physics (M.Sc.)

Research Guidance

Ph. D. Completed under my supervision - 5
Ph.D. continuing under my supervision - 2
Supervised several Project Fellows and M.Sc. dissertations.

One students working on CMS experiment at LHC, CERN.
Another student working on detector and physics aspects of INO-ICAL detector.

Project Fellows are working on various topics including the development of Proton Computed Tomography for cancer therapy and generic detector R&D.

Publications Profile

Complete list is provided separately. Only main publications are provided here:

- 1. Uniformity study of large size glass RPC detector using an alternative front-end electronics for INO-ICAL experiment, Aman Phogat, Moh Rafik, Ashok Kumar, Md. Naimuddin, Nucl.Instrum.Meth. A 978 (2020) 164336.**
- 2. Development and qualification of triple-GEM detector built with large size single mask foils produced in India, A. Ahmed, M. Gola, I A. Kumar and Md. Naimuddin, JINST 15 P02003, 2020.**
- 3. Performance of the triple GEM detector built using commercially manufactured GEM foils in India, M. Gola, S. Malhotra, A. Shah, A. Ahmed, A. Kumar, M. Naimuddin, Nucl.Instrum.Methods A 951 (2020) 162967.**

4. **Outgassing and leak test of INO-ICAL RPC detector**, A. Phogat, R. Ahmad, H. Kumar, A. Ahmed, A. Kumar and Md. Naimuddin, **JINST 15 T10006**, 2020.
5. **Stability tests performed on the triple GEM detector built using commercially manufactured GEM foils in India**, M. Gola, S. Malhotra, A. Kumar and M. Naimuddin, **JINST P08004**, 2019.
6. **Impact of single-mask hole asymmetry on the properties of GEM detectors**, A. Shah, A. Sharma, A. Kumar, J. Merlin, Md. Naimuddin, **Nucl.Instrum.Methods A 936 (459-461)**, 2019.
7. **Independent measurement of muon neutrino and anti-neutrino oscillations at the INO-ICAL Experiment**, Z. A. Dar, D. Kaur, S. K. Verma and Md. Naimuddin, **J. Phys.G: Nucl. Part. Phys. 46 (065001)**, 2019.
8. **Layout and assembly technique of the GEM chambers for the upgrade of the CMS first muon endcap station**, D. Abbaneo,, Md. Naimuddin, et. al, **Nucl.Instr.Mthods A 918 (67-75)**, 2019.
9. **New front-end electronics for INO-ICAL experiment**, A. Phogat, A. Gaur, M. Rafik, A. Kumar and Md. Naimuddin, **Nucl.Instrum.Methods A 905 (193-198)**, 2018
10. **Development, characterization and qualification of first GEM foils produced in India**, A. Shah, A. Ahmad, M. Gola, R. K. Sharma, S. Malhotra, A. Kumar, Md. Naimuddin, P. Menon and K. Srinivasan, **Nucl.Instrum.Meth A 892, (10-17)**, 2018.
11. **Timing and Charge measurement of single gap Resistive Plate Chamber detector for INO-ICAL experiment**, Ankit Gaur, Ashok Kumar and Md. Naimuddin, **Nucl.Instrum.Meth. A 877 (246-251)**, 2018.
12. **Search for the differences in atmospheric neutrino and antineutrino oscillation parameters at the INO-ICAL experiment**, Daljeet Kaur, Zubair Ahmad Dar, Sanjeev Kumar and Md. Naimuddin, **Physical Review D 95, 093005** (2017).
13. **Overview of large area triple-GEM detectors for the CMS forward muon upgrade**, D. Abbaneo,, Md. Naimuddin, et. al., **Nucl.Instr.Methods A 845 (298-303)**, 2017.
14. **R&D on a new type of micropattern gaseous detector: The Fast Timing Micropattern detector**, D. Abbaneo,, Md. Naimuddin, et.al., **Nucl.Instr.Methods A 845 (313-317)**, 2017.
15. **The model-independent analysis for Higgs boson**, Md. Naimuddin and Shivali Malhotra, **Pramana J Phys (2016) 87:36**.
16. **The sensitivity of the ICAL detector at India-based Neutrino Observatory to neutrino oscillation parameters**, Daljeet Kaur, Md. Naimuddin and Sanjeev Kumar, **Eur. Phys. J. C 75, 156** (2015).
17. **Development of a proton Computed Tomography Detector System**, Md. Naimuddin, G. Coutrakon, G. Blazey, S. Boi, A. Dyshkant, B. Erdelyi, D. Hedin, E. Johnson, J. Krider, V. Rukalin,

- S.A. Uzunyan, V. Zutshi, R. Fordt, G. Sellberg, J.E. Rauch, M. Roman, P. Rubinov and P. Wilson, **JINST 11 C02012 (2016)**.
18. **Precise determination of the mass of the Higgs boson and tests of compatibility of its couplings with the standard model predictions using proton collisions at 7 and 8 TeV**, S. Chatchyan,, Md. Naimuddin, *et al.*, **Eur. Phys. J. C 75, 212 (2015)**
 19. **Characterization of 3 mm glass electrodes and development of RPC detectors for INO-ICAL experiment**, Daljeet Kaur, Ashok Kumar, Ankit Gaur, Purnendu Kumar, Md. Hasbuddin, Swati Mishra, Praveen Kumar and Md. Naimuddin, **Nucl. Instr. Meth. A 774 (2015) 74-81**.
 20. **Hadron energy resolution as a function of iron plate thickness at ICAL**, Moon Moon Devi, Anushree Ghosh, Daljeet Kaur, Lakshmi S. Mohan, Sandhya Choubey, Amol Dighe, D. Indumathi, M. V. N. Murthy and Md. Naimuddin, **JINST 9 T09003 (2014)**.
 21. **Hadron energy response of the Iron Calorimeter detector at the India-based Neutrino Observatory**, M. M. Devi, A. Ghosh, D. Kaur, S. M. Lakshmi, S. Choubey, A. Dighe, D. Indumathi, S. Kumar, M. V. N. Murthy and Md. Naimuddin, **JINST 8, P11003 (2013)**.
 22. **Measurement of the sum of WW and WZ production with W+dijet events in pp collisions at sqrt(7) TeV**, S. Chatchyan,, Md. Naimuddin, *et al.*, **Eur. Phys. J. C 73, 2283 (2013)**.
 23. **Search for the standard model Higgs boson in $ZH \rightarrow l^+ l^- bb$ production with the D0 detector in 9.7 fb^{-1} of pp collisions at $\sqrt{s}=1.96 \text{ TeV}$** , V. Abazov,, M. Naimuddin, *et al.*, **Phys. Rev. Lett. 109, 121803 (2012)**.
 24. **Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC**, S. Chatrchyan,, Md. Naimuddin, *et al.*, **Phys. Lett. B 716 (2012) 30-61**.
 25. **Model independent search for new phenomena in ppbar collisions at sqrt(s) = 1.96 TeV**, V. Abazov,, M. Naimuddin, *et al.*, **Phys. Rev. D, 85, 092015, (2012)**.
 26. **Search for $ZH \rightarrow l^+ l^- bb$ Production in 4.2 fb^{-1} of pp Collisions at $\sqrt{s} = 1.96 \text{ TeV}$** , V. Abazov,, M. Naimuddin, *et al.*, **Phys.Rev.Lett., 105, 251801, (2010)**.
 27. **A Combined Search for the Standard Model Higgs Boson at $\sqrt{s} = 1.96 \text{ TeV}$** , V. Abazov,, M. Naimuddin, *et al.*, **Physics Letters B 663, 26, (2008)**.
 28. **Design and Implementation of the New D0 Level-1 Calorimeter Trigger**, M. Abolins,, M. Naimuddin, *et al.* **Nucl. Instrum. and Methods A 584/1, 75(2007)**.
 29. **The Upgraded D0 Detector**, V. Abazov,, M. Naimuddin, *et al.*, **Nucl. Instr. and Methods A 565, 463 (2006)**.
 30. **Measurement of Bd mixing using opposite-side flavor tagging**, V. Abazov,, M. Naimuddin, *et*

al., **Phys. Rev. D**, **74**, 112002 (2006) .

31. **Direct Limits on the B_s^0 Oscillation Frequency**, V. Abazov,, M. Naimuddin, *et al.*, **Phys.Rev.Lett.** **97** 021802 (2006). in, Swati Mishra, Praveen Kumar and Md. Naimuddin, **Nucl. Instr. Meth. A** **774** (2015) 74-81.

Matter Antimatter Oscillations, Md. Naimuddin, A book published by **LAP Lambert Academic Publishing house, Germany, ISBN: 9783838333250, 2010**

Conference Organization/ Presentations (in the last three years)

1. **The Elusive neutrinos** - Invited talk at the CMHEP conference, March 05- 06, 2021, ECC, Allahabad, India.
2. **GEM Detectors - Development, Application and Current status of Indian Efforts** - Invited talk at the XXIV DAE-HEP symposium, December 14 - 19, 2020, NISER, Bhubaneswar, India.
3. **The status of gaseous detector R&D** – Invited talk at the SQU-CMS Detector and Physics workshop, April 08-10, 2019, Sultan Qaboos University, Muscat, Oman.
4. **Summary of the Higgs boson measurements at LHC** - Invited talk at Kruger workshop, December 03- 07, 2018, Kruger, Hazyview, South Africa.
5. **Measurement of difference in oscillations parameters of neutrino and anti-neutrino at Magnetic Calorimeter** – Invited talk at NuHorizons, February 21 -23, 2018, HRI, Allahabad, India.
6. **Results and Prospects in VBS-VV Production in Charged Diboson Channels (including aQGCs): WW, WZ, Wy** – Invited talk presented at MBI 2017, August 28-30, 2017, Karlsruhe University, Germany.
7. **Development of proton computed tomography for cancer diagnosis** – Presented at DAE Symposium on High Energy Physics, December 12 -16, 2016, University of Delhi, Delhi.
8. **CMS Upgrade and Future Prospects** – Presented at EILH, November 02 -06, 2016, AMU, Aligarh, India.
9. **Development and Characterisation of Large size RPC detectors for INO-ICAL experiment** – Presented at International Conference in High Energy Physics (ICHEP) 2016, August 03 – 10, 2016, University of Chicago, Chicago, USA.
10. **Timing and Charge measurements of INO-ICAL RPC Detectors** – Presented at Workshop on Resistive Plate Chamber (RPC) Detectors, February 22 – 26, 2016, Ghent University, Ghent, Belgium.
11. **Development of Large Area RPC Detector for INO-ICAL Experiment** – Presented at IEEE-NSC Conference, Oct. 31 – Nov. 07, 2015, San Diego, USA.

12. **Status of INO Experiment** – Invited talk presented at NNN15, Oct. 28 – 31, 2015, SUNY, Stony Brook, NY, USA.
13. **Development of a High Rate Proton Computed Tomography Detector System** – Presented at the International Workshop on Radiation Imaging Detectors (iWoRid), June 28 – July 02, 2015, DESY, Hamburg, Germany
14. **Characterization of the Glass electrodes and RPC's for the INO-ICAL experiment** – Presented at the XII Resistive Plate Chambers Detectors and Related Technology (RPC2014) workshop, February 23-28, 2014, Tsinghua University, Beijing, China.
15. **Search for New Physics at LHC** – Invited talk at “What Next at LHC” conference, January 06-08, 2014, Tata Institute of Fundamental Research, Mumbai, India.
16. **Status of Higgs boson and Beyond at Colliders** – Summary talk at the XII workshop on High Energy Physics and Phenomenology (WHEPP), December 12-21, 2013, Puri, India
17. **Status of India-based Neutrino Observatory** – Invited talk at the Cosmology and Particle Astrophysics (CosPA) conference, November 2012, NTU, Taipei, Taiwan.
18. **Proton Computed Tomography for Cancer Therapy** – Invited talk at National Symposium on Particles, Detectors and Instrumentation, March 2012, TIFR, Mumbai, India.
19. **Model Independent Search for New Physics at the CMS Experiment** - Poster presented at the hadron Collider Physics Conference, November 2011, Paris, France.
20. **Model Independent Search for New Physics at the D0 Experiment** - Poster presented at the Lepton-Photon 2011 conference, August 2011, Mumbai, India.
21. **Recent results from the Fermilab Tevatron** – Invited talk at the 4th Turkish National Science Congress on Accelerators and its applications, September 2010, Bodrum, Turkey.
22. **Model Independent search for new physics at D0 experiment** – XXIX Physics in Collision, August-September 2009, Kobe, Japan.
23. **Search for new physics in a Model Independent way** – Particles and Nuclei, November 2008, Eilat, Israel.
24. **Masses, Lifetimes and Mixing in B and D hadrons** – Invited talk at Recontres de Moriond, March 2008, La Thuile, Italy.
25. **Measurement of B_s^0 mixing oscillations and search for new physics at D0 experiment** - Poster presented at SLAC summer conference, August 2007, Menlo Park, Ca, USA
26. **Model Independent searches for new Physics at D0** - Pheno2007 conference, May 2007, University of Wisconsin, Madison, USA
27. **B_s mixing studies at the Tevatron** – Invited talk at Recontres de Moriond, March 2006, LaThuile, Italy

28. **B-flavor Tagging with soft electrons with D0 Detector** - APS April Meeting, April 2005, Tampa, FL, USA
29. **B-flavor tagging with Opposite side soft electrons and Bd mixing at D0** - GSA annual conference, June 2005, Fermilab, Batavia, IL, USA
- Organized DAE-HEP Symposium 2016 at University of Delhi.**
- Organised Xth SERC School in Experimental High Energy Physics in 2016.**

Research Projects (Major Grants/Research Collaboration)

Search for the New Particles at the CMS experiment at LHC, DST, India
R&D Efforts by University Groups for INO-ICAL project, DST, India
Development of Gaseous Electron Multiplier (GEM) detectors and its applications in basic science Medical Physics, INSA, India - Completed
Development of proton Computed Tomography, UGC, India – Completed.
Simulating the elements of proton computed Tomography for cancer therapy, NIU, USA - Completed
R&D activity for INO Resistive Plate Chamber detector (RPC) detector, DST, India – Completed.
Search for New Phenomena at the CMS experiment at LHC at CERN, DST, India – Completed.

Awards and Distinctions

Awarded CERN Scientific Associateship, 2016
Awarded INSA medal for young scientists, 2011.
Adjunct Professor, Northern Illinois University, Dekalb, IL, USA
Received “European Union Award for young researchers” twice to attend “Moriond QCD conference in 2006 and 2008” at La Thuile, Italy.
Received Department of Particle and Fields, USA travel award to attend APS conference in 2005 at Tampa, Florida, USA.
Visiting Fellow, Fermilab Particle Physics Division from 2004-2006.

Association With Professional Bodies

Member, American Physical Society (2005-2007).
Referee for the Journal of Instrumentation (JINST).

Other Activities

Involved in science and education outreach programs for general public. Writes in newspapers and participates in visual media panel discussions. Active in improving the teaching methodology in schools and colleges.

Signature of Faculty Member