Curriculum Vitae

(Last update : 29.5.2017)

Dr. Manjit Kaur
Professor of Physics
Department of Physics
Center of Advanced Study
Panjab University
Chandigarh -160014
India

Phone :: +91-172-2534492 (O)
+91-172-2695594 (R)
cell :: +91-9464683959
e-mail : manjit@pu.ac.in
Manjit.Kaur@cern.ch

Broad subject area : Physical Sciences
Area of specialization: High Energy Physics
Date of birth: 13 February, 1954

Educational qualifications: **Ph.D. (High Energy Physics), MCA (Computer Science)**

Details of professional training and research experience

- Teaching Experience 36 years
- Research Experience 40 years
- Administrative Experience Member P.U. Senate : 2004-2008
  Member P.U. Syndicate: 2007-2008
  Chairman: Department of Physics, P.U. (2013-2014)

Professional Experience and Research interests

My research interests are focused on improving our understanding of the fundamental physics particularly, the structure of hadronic matter. Hadrons are the basic building blocks of all matter and are envisaged to be composed of truly elementary particles called quarks and gluons which are confined inside hadrons by strong forces. All experimental efforts to isolate a quark or gluon have so far remained in vain. Quantum Chromo-dynamics , the theory of strong interactions offers the best possible explanation of the behavior of quarks and gluons. Though the quarks and gluons have so far not been isolated, their footprints in the experimental determinations have confirmed their existence beyond doubt. I have been working on various experiments, mentioned below, using different particles as probes to study the hadronic structure.

Participation in Frontline High Energy Physics experiments

- **CMS Experiment at CERN , Geneva, Switzerland (From 1999 –till date) :** Currently, member of the CMS experiment **which has recently made the historic discovery of the Higgs Boson.** Contributions have been made to the Hardware (Outer Hadron Calorimeter) by fabricating, testing and installing the Scintillation Counters. Simulation studies are Performed to do the detector response and Physics studies. Currently undertaking Inclusive jet studies, Drell Yan production of di-muons and the subjet structure of jets at LHC. Also participating in the hardware activities of Hadron calorimeter (HCAL) Backend electronics.

- **L3 Experiment at CERN , Geneva, Switzerland (1989 – 2005) :** Worked as a Scientific Associate of CERN on the L3 experiment at CERN (1990-2005) to study the e^-e^+ interactions at LEP (Large Electron Positron Collider). Contributions were made to the Hadronic Physics (QCD). Participated in both data analysis and the data taking shifts.

- **Zeus Experiment at DESY, Hamburg, Germany (Since January, 2007) :** Also participating in the Zeus experiment at DESY, Hamburg, Germany as a collaborating member of ZEUS and Max Planck Institute, Munich, Germany. The data taking of the experiment finished in May, 2007. Since

then we are contributing to the data analysis for measuring structure functions and Parton Distribution Functions (PDFs).

- **EMU01 Collaboration (1984-1991):** Study of interactions of pions and heavy-ions with emulsion nuclei at very high energies.

- **Methods of non-extensive Statistical Mechanics, Tsallis statistics** and application to multi-particle production in high energy particle and nuclear collisions.

- P**erturbative and Non-perturbative QCD effects at High Energy Colliders:** Study of perturbative and non-perturative QCD effects in interactions at LHC and e^+e^- annihilation at future Linear Collider.

Future Projects

- **LHC-HL:** New physics searches at High Luminosity LHC, jet Physics and Drell Yan processes for Z^0 cross section measurements
- **Linear Collider:** **P**hysics of hadronic jets with Linear Collider using e^+e^- annihilation at very high C.M. energy.

Graduate Students

- **Nine students completed their Ph.D. (2004, 2007, 2008, 2012, 2012, 2013, 2014, 2014, 2016)**

Students currently enrolled for Ph.D.

Five students are currently carrying out their research work for Ph.D. on CMS experiment at LHC.

Research Grants

Received funding under **9 Major and 2 Minor Research Projects**: during 1984 – 2014

Funding agencies:
TWAS, Trieste, Italy
UGC, Delhi, India
Max Planck Institute, Munich, Germany
EMFCSC, Erice, Italy
CSIR, Delhi, India
DST, New Delhi

International Assignments

- Visiting professor, Department of Physics, University of Windsor, Canada, August 2010 to Feburary, 2011.
- Invited as visiting Professor Department of Physics, University of Windsor, Canada 2012 for one year but could not go due to obligations with the CMS experiment.
- Visiting Researcher, ZEUS Experiment ; Electron – Proton Accelerator DESY (HERA), Hamburg, Germany, January 2007
- CERN, Geneva, Switzerland, 1999 – Present; On the average spending 3-4 months at CERN for R & D work and physics studies on the CMS Experiment at LHC. Deputations sponsored by DAE-DST, Govt. of India
- Scientific Associate in L3 experiment at CERN, Geneva, Switzerland, 1992 to 1995 ;
- Scientific Associate of World Laboratory, FBLJA project at LEP, CERN, Geneva, Switzerland, 1989 - 1992.
- Visiting Researcher, University of Birmingham, Birmingham, U.K., 1988.
- Visiting Researcher, Max Planck Institute of Physics and Astrophysics, Munich, Germany, 1988.

International Conferences Attended

- Convener of "Hadronic final states in high pt interactions" for ISMD2016, to be held in Jeju Island, Korea from 28 August-2 September, 2016.
- International School of Subnuclear physics, EMFCSE, Erice, Italy, Invited Scientist, June 14 – 23, 2016
- International School of Subnuclear physics, EMFCSE, Erice, Italy, Invited Scientist, June24 – July 3, 2015.
- HCP Symposium, University of Toronto, August 2010.
- DIS 2008, XVI International Workshop on Deep-Inelastic Scattering and Related Subjects, University College London, U.K. April 2008.
- RINGBERG Workshop on non-perturbative QCD of jets, Munich, Germany. January 8-10, 2007
- International Scholl of Sub-nuclear Physics held at EMFCSC, Erice, Italy. Invited Scientist August 29 – September7, 2006,
- XXVI International conference on Physics in Collision, June, 2003, DESY, Zeuthen, Germany
- XIII Topical Conference on Hadron Collider Physics, 1999, Mumbai, India
- XXVIII International Conference on High Energy Physics, 1996, Warsaw, Poland.
- Italian Physical Society, HEP Conference, La Aquila, 1991, Italy.
- XIII International conference on Physics in Collision, 1990, Colmar, France.
- XXIV International Conference of High Energy Physics, 1988, Munich, Germany

Conferences organised

- 3rd National Student Symposium of Physics (NSSP2013) sponsored by IAPT, India (Chairman)
- 2nd National Student Symposium (NSSP2014) sponsored by IAPT, India (Convener)
- 1st National Student Symposium (NSSP2013) sponsored by IAPT, India (Convener)
- Workshop on contemporary tends in High Energy Physics and instrumentation, P.U. 10-11 March, 2014. (Convener)
- 13th DAE symposium held at Panjab University, Chandigarh, 1998 (Organising Secretary)

Books Edited

- **Editor**: Monthly Bulletin of IAPT, India from January 2015 onwards. The bulletin has wide circulation with 1000 copies published monthly.

- Proceedings of the XIII DAE Symposium on High Energy Physics, 1998

Research Publications: more than 700 in peer reviewed international journals (Including the publications of collaborations, in which I am a co-author in CMS, L3 & Zeus)

7. Details of employment

- **Positions held (Panjab University, Physics Department, Chandigarh)**

Professor of Physics	2002 – 2014 & 2014-2019 (Reemployed)
Associate Professor	1994 – 2002
Assistant Professor	1984 –1994
Assistant Professor	1980-1984 (MCM DAV College, Chandigarh)

8. Professional recognitions, awards, fellowships received.

- **Convener and Chair of the session on:** "Hadronic final states in high pt interactions" for ISMD2016, to be held in Jeju Island, Korea from 28 August-2 September, 2016.
- **Deputy Spokesperson** : India-CMS Collaboration: 2014-2018
- **Member PAC:**, SERC School on HEP, Sponsored by DST, 2010-2012
- **Editor**: Monthly Bulletin of Indian Association of Physics Teachers(IAPT)
- **Vice President:** North Zone, IAPT, India
- **Invited Scientist:** Int. School of Subnuclear Physics 2006, 2015,2016, EMFCSC, rice, Italy

- **Life Member:** Indian Physics Association
- **Member:** Italian Physical Society

Fellowships:

- Guilio Racah Fellowship, EMFCSC, Erice, Italy, 1991
- **Fellowship:** JRF (CSIR) – 1976-1978, SRF (1979-1980)

Few Latest Research Publications: (2016-17)

1. Modified Tsallis and Weibull Distributions for multiplicities in e+e− collisions. S. Sharma, **M. Kaur** and S. Thakur. Accepted for publication in Phys. Rev. D , May(2017).

2. Statistical hadronization and multiplicities in high-energy hadron–nucleus collisions. S. Sharma, **M. Kaur**, and S. Thakur, *Int. J. Mod. Phys. E* 26, 1750006 (2017) .

3. Tsallis nonextensive entropy and the multiplicity distributions in high energy leptonic collisions. S. Sharma**, M. Kaur**, and Sandeep Kaur, Int. J. Mod. Phys. E **25**, 1650041 (2016) .

4. Searches for a heavy scalar boson H decaying to a pair of 125 GeV Higgs bosons hh or for a heavy pseudoscalar boson A decaying to Zh, in the final states with $h \rightarrow \tau\tau h$
By CMS Collaboration (**M. Kaur** and co-authors et al.). Phys. Lett. B755 (2016) 217-244.

5. Measurement of the underlying event activity using charged-particle jets in proton-proton collisions at $\sqrt{s} = 2.76$ TeV. By CMS Collaboration (**M. Kaur** and co-authors et al.). JHEP 1509 (2015) 137.

6. Pseudorapidity distribution of charged hadrons in proton-proton collisions at $\sqrt{s} = 13$ TeV
By CMS Collaboration (**M. Kaur** and co-authors et al.). Phys. Lett. B751 (2015) 143-163.

7. Production of leading charged particles and leading charged-particle jets at small transverse momenta in pp collisions at $\sqrt{s} = 8$ TeV
By CMS Collaboration (**M. Kaur** and co-authors et al.). Phys. Rev. D92 (2015) no.11, 112001.

8. Combination of measurements of inclusive deep inelastic $e^{\pm}p$ scattering cross sections and QCD analysis of HERA data By H1 and ZEUS Collaborations (H. Abramowicz, **M. Kaur** and co-authors et al.). Eur. Phys. J. C75 (2015) no.12, 580.