

Rohini M. Godbole
rmgodbole.in

Date of Birth: 12 th November 1952.

Academic career:

B.Sc. (Physics), University of Pune, India 1972, First Rank.

M.Sc. (Physics), Indian Inst. of Technology, Bombay, India, 1974, First Rank, Institute Silver Medal

Ph.D. (Physics), S.U.N.Y. at Stony Brook, N.Y., U.S.A, 1979.

1) Professional Positions:

- August 2018 – present: Honorary Professor, Centre for High Energy Physics, Indian Institute of Science, Bangalore.

- November 1995 – August 2018: Professor (1998-2018), Associate Professor (1995-1998), Chairperson 1996 - 2002, at the Centre for Theoretical Studies (Centre for High Energy Physics), Indian Institute of Science, Bangalore.

- November 1982–November 1995, Reader (1987-1995), Lecturer (1982-1987), Department of Physics, University of Bombay.

- Aug. 1982–November 1982, CSIR Research Associate, Institute of Science, Bombay.

- Sept. 1979–August 1982, Visiting Fellow, Tata Institute Of Fundamental Research (TIFR), Bombay.

2) Visiting Positions:

- September 2018- December 2018, Van der Waals Chair visiting Professor and distinguished visitor, Amsterdam Institute of Physics and Astronomy, Amsterdam.

- 2013-2016, Staff Associate, International Centre for Theoretical Physics (ICTP), Trieste, Italy.

- Feb 2011 - August 2011, Visiting Professor, Univ. of Utrecht, The Netherlands.

- June 2010 - Feb 2011, Scientific Associate, CERN Theory Division, CERN, Geneva, Switzerland.

- Adjunct faculty of the Tata Institute of Fundamental Research, Mumbai: Department of Theoretical Physics and International Centre for Theoretical Sciences, 2005-2010.

- Dec. 2002 - May 2003, DESY, Hamburg, Germany.

- May 2002 - Nov. 2002, Scientific Associate, CERN, Geneva, Switzerland,

- June 1986 - June 1988, Department of Physics, University of Dortmund, Dortmund, Germany.

- Associate Member of the ICTP: (1984-1992) (1995-2001).

A number of short term, one-two month, visits at various times at: CERN (Geneva), DESY (Hamburg), Madison (Wisconsin), ICTP (Trieste), LNF-INFN (Frascati), Hawaii (USA), LAPTH, Annecy, France, LPT, Orsay, France.

3) Honours, Awards:

Civilian Honours:

- Recipient, Ordre National du Merite, Civilian Honour of France, January, 2021.

- Padma Shree, Civilian Honour of India, January 2019.

Academy Fellowships:

- Honorary member by Marathi Vidnyan Parishad, April 2022

- Honorary Fellow, Karnataka Science and Technology Academy, January 2021.

- Fellow, The World Academy of Sciences (TWAS) (2010).

- Fellow, National Academy of Sciences, Allahabad, India (2007), Council Member and Vice President (January 2017- December 2018)

- Fellow, Indian National Science Academy (INSA), Delhi (2003), Council Member : 2011-2014.

- Fellow Indian Academy of Sciences, Bangalore (1992), Council Member: 2018-2024, Vice President 2022-2024.

- Young Associate of Indian Academy of Sciences, (1985-1988).

Honorary Doctorates

- D.Sc. (Honoris Causa), Visweswaraya Technological University, Belgaum, India (2022).

- D.Sc. (Honoris Causa), Indian Institute of Technology (Kanpur), December 2021.

- D. Litt. (Honoris Causa), 100 year old, S.N.D.T. Women's University, December 2013.

- D.Litt., (Honoris Causa), 100 year old Tilak Maharashtra Vidyapeeth, Pune, 2021.

Selected Medals and Awards: (For full list check the webpage)

- Goyal Prize in Physical Sciences, awarded by the Kurukshetra University, September 2021.
- Life time achievement Award of the Karnataka Science and Technology Academy in Science, Technology, Engineering, Agriculture, Medicine (STEAM)', January 2021.
- K. S. Krishnan Memorial Lecture Award of the Indian National Science Academy, 2019.
- R.D. Birla Award of IPA for 2018, given in 2019.
- APS outstanding referee for 2018.
- Satyendra Nath Bose Medal for Theoretical Physics of the Indian National Science Academy, 2008.
- J.C. Bose fellowship of the Department of Science and Technology of India, 2008-2020.
- Meghnad Saha Medal for Theoretical Physics of the Asiatic Society, 2007.
- Distinguished Alumnus Award by the Indian Institute of Technology, Powai, India (2004).

4) Research activity:

Currently a Professor at the Indian Institute of Science, Bangalore in India, she is a high energy phenomenologist. Phenomenologists have an important role to play in collider physics as they participate crucially in designing strategies to extract information from the data about the interactions governing the results of the collisions processes. She has mainly worked on two separate aspects. She has pointed out new processes that could be studied at e^+e^- and ep colliders, to understand some intricate features of the interactions of high energy photons as well as to study the internal spin structure of the proton. The former work has had implications for design of linear electron-positron colliders. Secondly she has developed strategies for the collider studies of new particles like the top quark, the higgs boson, the supersymmetric partners of the Standard Model(SM) particles etc., for determining their properties and for probing many ideas of physics beyond the SM using those measurements. Notable has been her work in studying top polarisation, as well as studying the CP nature of the Higgs boson and looking for an 'invisibly' decaying Higgs boson. Some of them have been used in the collider experiments and are being used currently by the experimental groups such as the CMS and the ATLAS at the LHC. Some are sure to be used at future colliders.

Some notable plenary talks given at the international conferences are:

- 1) Summary talk at Photon 2007
- 2) Talk at LCWS 2000, 2004
- 3) Talks at three SUSY conferences and PASCOS.

5) More specific information regarding publications/citations etc:

•Publications in Journals/ArXives:

302 citable entries in the high energy physics data base: INSPIRE-HEP. Out of these 165 are published in journals. Among these, 4 have citations more than 500, 3 have citations more than 250 and 12 are cited more than 100 times. The average citation for these is 56.4 and the H-index is 48. The numbers from Scopus and Web of Science database will show a similar trend.

•Books:

She has co-authored a text book on 'Theory And Phenomenology Of Sparticles' for Ph.D. students and researchers in area of High Energy Physics in January 2005.

•Books in the context of Women in Science:

This is discussed separately at the end.

6) Teaching:

• Teaching at University, IISc etc.:

Taught at University of Mumbai at masters level: at least one course each semester from 1982 to 1995, except 1986-1988, then at the Indian Institute of Science at the undergraduate, graduate and postgraduate level at least one course per semester each academic year from 1995 to 2018, except during the two years of Sabbatical leave in academic years 2002-2003 AND 2010-2011. Gave set of special lectures from time to time for the Ph.D. students.

• Lectures given at advanced schools:

I: National Schools

- i) Taught four advanced courses of 12 lectures each, on different aspects of the Standard Model and Collider Physics, SERC school Theoretical High Energy Physics in India held in 1984, 1996, 2002 and 2013.
- ii) Preparatory lectures on 'Introduction to Particle Physics' 1998, 2000 for theoretical particle physics students in India, iii) once for experimental particle physics students in India. iv) Similar course of lectures in two schools for Nuclear Physics in India.

II: International Schools

- **Electroweak Symmetry breaking and QCD**, summer school held by the Chinese Academy of Sciences, Beijing, China, 2004.

- **Supersymmetry at Colliders** in 'From Strings to LHC – II', Goa, India, 2007
- **Supersymmetry**: in Algerian Summer School in Oran, Algeria, 2009; Corfu Summer School, 2010.
- **Supersymmetry: Formalism and Phenomenology**, Special topic course at University of Utrecht, The Netherlands, February 2011 - July 2011.
- **Introduction to Standard Model**, six lecture course for CERN summer students, CERN (Geneva) Summer: 2011 and 2012.
- **Beyond Standard Model through the window of Electroweak Symmetry breaking**, in Vietnam School on Physics, Quy Nhon, Vietnam, 2012.
- **'Higgs Physics**;; Pre SUSY school at SUSY 2013, Trieste, Italy and **Supersymmetry Phenomenology**, Pre SUSY school at SUSY 2014, Manchester, U.K.
- **Field Theory of Standard Model**, Asia Europe Pacific School on High Energy Physics (AEPSHEP2014) Puri, India, 2014 and AEPSHEP 2022 Pyeongchang, Korea, 2022.
- **Standard Model (theory)**, ICFA seminar held in Beijing, October 2014.
- **Standard Model**, a set of seven lectures, SQU, Muscat, Sultanate of Oman, March 5-10, 2017.
- **Introduction to Collider Physics**, 4 lectures given at Formosa Summer School in High Energy Physics, Taiwan, 16-27 July, 2018.
- **Where is collider physics headed?**, Set of seven lectures delivered at the University of Amsterdam

7) International Research Projects:

- 2018-2021, DST India -BMWfW Austria project, **Defining next generation searches for beyond the Standard Model Physics**, with S. Kulkarni, University of Graz.
- 2016-2019, Co director of the '**International Associated Laboratory**' on **Indo French High Energy Physics Collaboration**, (LIA), between India and France, with F. Boudjema of LAPTH- Annecy, France.
- 2014-2017, **HT@ LHC,-Fundamental Interactions at the boundary of theory, phenomenology and experiments** , with F. Maltoni, Univ. of Louvain, Belgium.
- 2010-2013, **The Indo-US R & D Network Centre for Beyond Standard Model Physics Phenomenology**, a project supported by the INDO USSTF, with Univ. of Hawaai and Univ. of Wisconsin, USA.
- 2004-2008, **Collider Physics: SUSY, Higgs and CP violation at colliders** Project from the Indo French Centre for Promotion of Advanced Scientific Research (IFCPAR) , extended by one more year, with Univ. of Montpellier, C.N.R.S. laboratories LPT(Paris) and LAPTh (Annecy).
- 1998-2002, '**Collider Physics**, a project from IFCPAR, C.N.R.S Laboratory for High Energy Physics: LAPTh(Annecy).
- 1996-1999, '**Physics at Current and Future Colliders**', INDO -US collaborative research project funded by NSF(US) and the DST(India), with University of Hawaii.

8) Research Supervision in BU and IISc:

Ph. D. Theses: Three (Bombay University,BU), ten completed (IISc) and one in progress. (One Ph.D. student at BU from Sri Lanka.)
M.Phil. Theses : Three (Bombay University)
M.S. Theses: Five (IISc)
(International) Post doctoral fellows: 3.

8) Membership of Committees:

• Committees of International Programs:

- Member of the Advisory Group formed by the World Bank to support the Analytical and Advisory work (ASA) on NEP implementation started as a part of their Global Tertiary Education effort (2021-2022).
- Member, Advisory Group for the African Strategy for Fundamental and Applied Physics (ASFAP), (2020-2022).
- **Member, High Energy Physics Advisory Panel, USA, 2018-2020.**
- Member, International Advisory Board, CEPC: Chinese(circular) Electron Positron Collider, China, 2016-now.
- **Member, Scientific Council of the Indo-French Center for the Promotion of Advanced Research (CEFIPRA) 2014-2017.**
- **Member, International Detector Advisory Group for the International Linear Collider, 2007-2012.**
- **Member, International Advisory Committee, Asia-Europe-Pacific-Schools on High-Energy-Physics (AEPSHEP) 2012-2018.**
- **Member, Commission C11 on Particles and Fields of the International Union of Pure and Applied Physics, 2002–2005, 2008-2011.**
- **Member, AASSA (Association of Academies and Societies of Sciences in Asia) (Inaugural) Special committee on women in science and engineering, December 2013-December 2016.**
- **Committees of Indian Institutions of research and higher learning :**

- Member, Homi Bhabha Centre for Science Education, Management Board, 2021- 2024.
- Chair, Board of Management, University Department of Physics, University of Mumbai, 2021-2024.
- Member, Governing Body and Research Steering Committee for Sciences (RSC-S), of the Institute of Eminence (IoE) of the University of Hyderabad, 2020-now.
- Member, Research Advisory Committee, Indian Association for Cultivation of Science, Kolkata, India, 2018-2020.
- Member, Board of Governors, Indian Institute of Engineering Science and Technology, Shibpur, India, 2019-now.
- Member, Board of Governors, Indian Institute of Technology, Mumbai, 2014-2019.
- Member, Scientific Council of the Indian Statistical Institute, Kolkata, 2014-now.
- Member, Academic Council of the University of Hyderabad, 2011-2014.
- Member, Board of Governors, NIIT-Patna, 2013-2016, 2016-2017.
- Member, Scientific Advisory Council, Inter University Consortium for Astronomy and Astrophysics, IUCAA, Pune, Jan-2004- Dec-2008.
- Member, Review Committees for the Departments of Physics of a) Indian Institute of Technology, Mumbai, b) Indian Institute of Technology, Chennai and c) Indian Institute of Science Education and Research, Mohali, India (2014-2015).

• Committees of Government of India:

- Member, DST-DAE coordination steering Committee for CERN-India cooperation, 2015-now.
- Member, Scientific Advisory Committee to the Cabinet of India (SAC-C), 2007- 2013.
- Member, Program Advisory Committee, Department of Science and Technology (DST), India, (1997-2000) **and** Member, Expert Committee of Council for Scientific and Industrial Research (CSIR), India (1995-2010).
- Member DST-DAE (Dept. of Atomic Energy) expert committee for CERN-India Project, 1998-2015.

9) Science Education and Outreach:

Science Education

• She participates vigorously in the Science Education program run by the three Indian Science Academies, writing articles for its Science Education journal, conducting lecture workshops for teachers of Physics and Mathematics and also lecturing in these workshops. From 1995-2005, she ran yearly summer student program at the Centre for Theoretical Studies, Indian Institute of Science. She has guided routinely two or three summer students every summer for the last twenty years under different programs such as the Inter Academy Science Education program and various schemes of the department of Science and Technology. She has had students from Europe and USA come to India to spend summer or a semester in their master's program and they have published papers with her.

• She often delivers special lecture courses to college students. Recent examples are i) 'Nature of Symmetries and Symmetries of Nature', a set of three lectures at St. Stephens College, Delhi, February 2020 for students, ii) 'Quantum mechanics and scattering' Sree Siddaganga College of Arts, Science and Commerce" as a Joint Inter Academy Education Panel activity, 24-26 April 2021.

She has been involved with S.E.R.C. Schools for Ph.D. students in Theoretical High Energy Physics, being a member of the committee from 1994-2010 being the Chair 2005-2010. She was the Director '**XII S.E.R.C. School in Theoretical High Energy Physics, Held in Bangalore Feb.- March 1997**' and the organiser, Chair (LOC) for the International **2014 Asia Europe Pacific School of High Energy Physics, AEPSHEP2014**, held in Bhubaneswar, India, November 2014.

Outreach

She is sought after lecturer to talk about particle physics at all levels: at a popular level to general public, at a simple level for students and at a higher technical level for scientists who are not particle physicists or perhaps not even physicists. As an example, in the two years since 2012 July, after the announcement of the new boson at the LHC, she gave 24 popular talks and nine colloquia on the topic of the Higgs and LHC physics. She gives many popular lectures and also writes popular articles in news papers.

10) Women in Science activity:

Initiatives and publications in the context:

She is also very concerned about the state of representation of Women in Science in general and in India in particular. She was member of the committee that brought out the '**INSA Report : access for Indian Women to careers in science**', the first such recent study in India. She conceived and co-edited the book '**Lilavati's Daughters: Women scientists of India**' containing biographical and autobiographical sketches of about 100 Indian women scientists, which was reviewed, for example, in Nature and Science. It was considered for reading lists of sociology courses at universities. This has now gone in its fifth printing. She has also co-edited a book called '**A Girls Guide to Life in Science**' published by Zubaan, India, meant for girls making a choice of life in Science. **She has been an advisory editor of the Unesco**

report ‘**A Braided River – The Universe of Indian Women in Science**’ that has been released in 2022. She was the founding chair of the Indian Academy of Sciences Panel for Women in Science and has put in many programs in place to increase and facilitate participation of women in science in India. She guided a survey to understand reasons behind the dropout of women from a science career AFTER a doctorate, which is a serious issue in India. She is involved in these efforts at the Asian level as well.

Membership of committees related to women in science

- Member, Expert Committee, Implementation of Programmes for Accelerated Participation of Women in Science and Technology, Department of Science and Technology.
- Chair, Advisory Committee of the Department of Science and Technology, for the implementation of the Gender Advancement Transformative Initiative (GATI).
- Member, ‘The World Academy of Sciences Gender Advisory Committee (TWAS GAC)’, 2021-2024.
- Member, Standing Committee of Women in Science of the Government of India, 2015-now.
- Chair, Committee for Physical and Mathematical Sciences, WOS/A scheme of the DST, 2004-2007.
- **(Founding)Chair**, Panel for Women in Science of the Indian Academy of Sciences, Bangalore, India (2005-2016).
- Member, Joint panel for Women in Science of the Indian National Science Academy, Indian Academy of Sciences and The National Academy of Sciences, India (2014-now).
- Convener, Committee on Women in Science, of the Indian Academy of Sciences, Bangalore, (2003).

11) Editorial and referee responsibilities (full list see the webpage):

- Chief (mentor) Editor, Indian Journal of Pure and Applied Physics, brought out by CSIR, India, since January 2022.
- Member, Editorial Board, Journal of Physics G, IOP Journal, UK, 2019-2022; Member Executive Editorial Board, from April 2022 .
- **Chair of the committee to draft the ‘Equity and Inclusion Chapter of the Science and Technology Innovation Policy of India’, STIP-2020.**
- **Member, Board of Advisory Editors, Oxford Research Encyclopedia of Physics**, 2018-2020.
- Editorial Board Member: Pramana, Journal of Physics, Indian Academy of Science, 1995-1998.
- **Editor Pramana, Journal of Physics, Indian Academy of Science (1998-2015), Chief Editor: 2007-2015 , Associate Editor 1998-2007.** The journal became completely online during her association and saw an increase in the impact factor.
- Editor: LHC/LC Report. An international Report brought out to evaluate the synergy between the hadronic high energy collider LHC and the International Leptonic Collider in Planning, the ILC.

12) Scientific Organisation:

- She organised formation of an ‘Indian Working Group(WG) on Linear Collider Physics’ under the aegis of ACFA: Asian Committee for Future Accelerators. Managing a DST funded project to coordinate the activities of the Indian Working Group.
- Founded the series of several International Workshops on High Energy Physics Phenomenology and involved in organising 12 of them: WHEPP1 to WHEPP12. Convener for two of them.
- Organising Committee of the two year long ‘**Workshop on CP studies and non-standard Higgs physics**’ resulting in CERN Yellow report. May 2003 -May 2005, resulting in a CERN yellow report, which is a reference document on the subject. Co-Convener, CERN theory group summer institute on ‘Top physics ’ summer 2009.
- Convener, Supersymmetry phenomenology, International Conference on Supersymmetry and Unification of Fundamental Interactions at: i)SUSY04, Tsukuba, Japan, June 2004 ii) SUSY 2013, Trieste,Italy, iii)SUSY 2014, Manchester, U.K. and iv) SUSY 2016, Melbourne, Australia **AND** Member, International Advisory Committee, International Conference on Supersymmetry and Unification: i)SUSY 04, Tsukuba, Japan, ii) SUSY06, Irvine, California, U.S.A., iii)SUSY 13, Trieste and iv) SUSY17, Mumbai, India. .
- Member,International Advisory Committee, International Workshop on Linear Collider Physics, held in Americas, Asia and Europe by rotation in 2000,2002,2005,2007, 2010, 2011,2017 and 2018.
- Member, Program Advisory Committee, the International Workshop on Physics at TeV colliders, Les Houches, France, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017.
- Member International Advisory Committee, ‘XXI International Symposium on Lepton-Photon Interactions at High Energies : LP03, Fermilab, Batavia, U.S.A., LP05, Daegu, Korea, LP07, Hamburg, Germany , LP13, San Fransisco and LP15, Ljubljana , Yugoslavia
- Member, International Advisory Committee, Annual International Conference on Large Hadron Collider Physics, 2016, 2018, 2020,2022 held in Asia, Americas and Europe by rotation.
- **Convener, International Workshop On Linear Colliders, LCWS06, March 9-13, 2006, Bangalore, India.**
- **Organiser, XXV International Symposium on Lepton-Photon Interactions at High Energies, 22-37 August, 2011, Mumbai, India.**

- **Organiser, 'Indo-French Women in Science seminar through IFCPAR: Indo French Centre for Promotion for Advanced Scientific Research, February 2015.**

- Member, International Advisory Committee, International Meeting on Higgs Coupling, Durham, U.K., October 2015, SLAC November 2016, Heidelberg, November 2017 and Japan, 2018.

- **Organiser, Indo-French Network (INFRE-HEPNET) meetings, May 2016, Bangalore, IISc, India, February 2018, Pune.**

- **Organiser, Topical meeting, 'Is Supersymmetry the best bunker to hide in, in view of the experimental data from LHC?', Indian Institute of Science, May 10-13, 2018.**