L.A.D. & Smt. R.P. College for Women, Nagpur

FACULTY PROFILE

❖ Basic Information

- **Name:** Dr. Vaijayanti G. Asolkar
- **Designation:**Associate Professor and Head
- **Department:** Physics
- **Area of Specialization:**

  1) Atomic and Molecular Physics,
  2) Structure and Bonding, XANES, EXAFS,
  3) Nanomaterials, Novel Materials
- **VIDWAN ID- 50429**
- **ORCID ID: 0009-0007-2346-4763**
- **Google Scholar ID link-**
  https://scholar.google.com/citations?hl=en&user=JTJyuCgAAAAJ

❖ Educational Qualifications: M. Sc., CSIR JRF, M. Phil., Ph. D., Higher Diploma in German.

- **Teaching Experience: Since October 01, 1986**
- **Total Teaching Experience: 39 Years**
- Teaching Portfolio: Dr. Vaijayanti G. Asolkar has taught B. Sc. (Physics) and M. Sc. Physics, as well as B. Sc. (Home Science) and Bachelor of Electronics and Software Technology courses in the then Nagpur University, now known as Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

❖ Research Experience

- **Total Research Experience: 25+ years**
- Research Guidance (M.Phil/Ph.D. Guided): M. Sc. Dissertations, B. Sc. Project work (NEP)

- **Areas of Research Interest:**
    - **Atomic and Molecular Physics,**
    - **Structure and Bonding, XANES, EXAFS,**
    - **Nanomaterials, Novel Materials**
    - **Women in Physics**
    - **Women in STEM (Science Technology Engineering and Mathematics)**
    - **Women's Studies**
    - **Science Education**
    - **Physics Education**
    - **Technology Management**

❖ **Research Publications**

(A) Research Papers in National/ International **Journals**

- "Dependence of rotational constants of diatomic halides on electronegativity", C. Mande and V. G. Asolkar, Indian J. Pure Appl. Phys. **34**, p.47-48 (1996).*****
- "XANES features in fluoromethanes and electronegativity", V. G. Asolkar and C. Mande, *Indian J. Phys.* **71A(1)**, p. 47-52 (1997).*****
- "Dependence of rotational constants of diatomic halides on electronegativity – II", V. G. Asolkar and C. Mande, *Indian J. Pure Appl. Phys*. **35**, p.359-362 (1997).
- "Systematization of some properties of diatomic molecules using the electroneagtivity scale based on X-ray spectroscopic results", C. Mande and V. G. Asolkar, in ***'X-ray Spectroscopy and Allied Areas'*****,** (Proceedings of the 6th National seminar on X-ray Spectroscopy and Allied Areas, Ratlam, India), ed. S. K. Joshi, B. D. Shrivastava and A. P. Deshpande, Narosa Publishing House, New Delhi, p. 142-149 (1998).

- Dependence of rotational constants of homonuclear and intragroup diatomic molecules on electronegativity", C. Mande and V. G. Asolkar, *Proc. Nat. Acad. Sci. India*, **69A, II**, p. 237-245 (1999).*
- "Estimation of inter-nuclear distance in some diatomic molecules", V. G. Asolkar and C. Mande, *Indian J. Pure Appl. Phys*. **39**, p.130-136 (2001).*
- "Dependence of rotational constants of diatomic oxides and chalcogenides on electronegativity", V. G. Asolkar and C. Mande, *Proc. Nat. Acad. Sci. India* (*Proc. Nat. Acad. Sci. India*, **73A, III**, p. 391-404 (2003).
- "Estimation of internuclear distance in some diatomic molecules viz. SrCl, CaBr, MgI, BiF, AsCl, SbCl, LiRb and SbS", V. G. Asolkar and C. Mande (National Academy of Science Letters, India in Vol. 27, No. 5&6, 2004).
- "Correlation of T_c of superconducting materials with electronegativity" V. G. Asolkar and C. Mande (communicated).*

- Dependence of rotational constants of diatomic halides on electronegativity-II
  VG Asolkar, C Mande
  Indian journal of pure & applied physics 35 (6), 363-37

- Dependence of rotational constants of diatomic halides on electronegativity
  C Mande, VG Asolkar
  Indian journal of pure & applied physics 34 (1), 47-48

- XANES Features in Fluoromethanes and Electronegativity
  VG Asolkar, C Mande
  Indian Journal of Physics 71 (Part A), 47-52

- Estimation of the internuclear distance in some diatomic molecules, viz. SrCl, CaBr, MgI, BiF, AsCl, SbCl, LiRb and SbS

VG Asolkar, C Mande
National Academy Science letters 27 (5-6), 221-225

- Dependence of rotational constants of diatomic oxides and chalcogenides on electronegativity
  VG Asolkar, C Mande
- PROCEEDINGS-NATIONAL ACADEMY OF SCIENCES INDIA SECTION B 73 (3), 391-404

- Estimation of inter-nuclear distance in some diatomic molecules
  VG Asolkar, C Mande
  INDIAN JOURNAL OF PURE & APPLIED PHYSICS 39 (3), 130-136

- Dependence of rotational constants of homonuclear diatomic molecules on electronegativity
  C Mande, VG Asolkar
  PROCEEDINGS-NATIONAL ACADEMY OF SCIENCES INDIA SECTION A, 237-246

- Systematization of some properties of diatomic molecules using the electronegativity scale based on X-ray spectroscopic results
  C Mande, VG Asolkar
  X-ray Spectroscopy and Allied Areas, 142

(B) Books / Book Chapters

- Systematization of some properties of diatomic molecules using the electronegativity scale based on X-ray spectroscopic results
  C Mande, VG Asolkar X-ray Spectroscopy and Allied Areas, 142

Edited- Book.

- Physics Semester II Based on syllabus of R.T.M. Nagpur University, Nagpur. Text Book of Indian Astronomy (IKS-BIK2T02), ISBN 978-93-48359-80-3

(C) Conference / Seminar Proceedings:

Authored- Book Chapter

- Systematization of some properties of diatomic molecules using the electroneagtivity scale based on X-ray spectroscopic results', C. Mande and V. G.Asolkar, in 'X-ray Spectroscopy and Allied Areas', (p. 142-149) (1998). Proceedings of the 6th National seminar on X-ray Spectroscopy and Allied Areas, Ratlam, India), ed. S. K. Joshi, B. D. Shrivastava and A. P. Deshpande, Narosa Publishing House, New Delhi, India. **(ISBN81-7319-243-X)**

❖ Orientation / Refresher Courses / FDPs Attended

- Refresher Course in Astronomy and Astrophysics, IUCAA (Inter University Center for Astronomy and Astrophysics), Pune, India, May 10-28, 1993.
- Orientation Course for College and University Teachers, Academic Staff College, Nagpur 1993
- Refresher Course in Physics, Amaravati University, Amaravati, India, April 06-29, 1996.
- School on the Use of Synchrotron Radiation in Science and Technology: 'John Függle Memorial' held at International Centre for Theoretical Physics (ICTP), Trieste, Italy. October 31 - December 5, 1997. This training was fully funded by IAEA (International Atomic Energy Agency) and UNESCO. Under this programme, Dr. V. G. Asolkar had opportunity to visit the Italian Synchrotron Facility 'Elettra' and discuss her work in soft X ray region (EXAFS Beamline of Elettra Synchrotron)
- participated in National Level E-Conference 'Quality Education: Blackboard to Techboard in the Post COVID Scenario' Organized by Internal Quality Assurance Cell, Hislop College, Nagpur in collaboration with National Assessment and Accreditation Council (NAAC), Bangalore. on Wednesday, 10th March, 2021

- Participated in International Conference on “Smart Materials : Application to Devices (ICSMAD - 2021)" Jointly Organized by Department of Physics and Department of Electronics, Amar Sewa Mandal’s Kamla Nehru Mahavidyalaya, Nagpur, 17th and 18th May 2021.
- Participated in National Level Faculty Development-cum-Orientation Programme on Assessment and Accreditation Process of NAAC from 20 to 27 Oct, 2021 Organised by Santaji Mahavidyalaya, Nagpur, Yashoda Girls Arts & amp Commerce College, Nagpur, J. M. Patel Arts, Commerce & Science College, Bhandara, Dharampeth M. P. Deo Memorial Science College, Nagpur, Mahila Mahavidyalaya, Nagpur, Dr. M.K. Umathe College, Nagpur, Bar. Sheshrao Wankhede College of Arts & Commerce, Khaparkheda.
- Dr. Vaijayanti G. Asolkar participated in MS-DEED Level 1 Online Workshop on Introduction to Innovative Pedagogies for Teachers of Undergraduate Science & Mathematics, 14-16 December 2021, organized by IISER, Pune. She was nominated by College for this workshop.
- Nominated by college to participate in One day State Level One day State Level Women’s Empowerment Conference (एक दिवसीय राज्यस्तरीय महिला सक्षमीकरण परिषदःसंयुक्त राष्ट्र शाश्वत विकास उद्दिष्टे, महिला सक्षमीकरण आणि उच्च शिक्षण) organized by Government of Maharashtra,Department of Higher and Technical Education, at Khshaba Jadhav Kreeda Sankul Indoor Hall in Savitribai Fule Pune Vidyapeeth Campus, Pune, on 23rd October 2023.
- Participated in one day National Symposium on NEP, A Global Perspective for HEI, organized by Manthan for Academia, Nagpur on 16th December 2023.
- Online Workshop on “ The Implementation of NEP-2020 at UG Level: Issue and Challenges”, on 22nd July, 2024 organized by The IQAC of Principal Arunrao Kalode Mahavidyalaya, Dr. M. K. Umathe College,Nagpur and Smt Rajkamal B. Tidke Mahavidyalaya, Mouda along with the IQAC of RTM Nagpur University.
- University level workshop on National Credit Framework as per NEP 2020 on 15th June 2024, organized by Shri Mathuradas Mohota College of science and Board of Studies in Physics, RTM Nagpur University.
- Participated in the Two-Day Workshop on “Computer Interface Physics Experiments using ExpEyes-17/Seelab3” held on 28th - 29th August 2024,Organized by Shri Shivaji Science College,Nagpur in association with IAPT (Indian Association of Physics Teachers) Vidarbha SRC08 E.

- The online NEP 2020 orientation and sensitization program under the Malviya Mission Teacher Training Program (MM-TTP) organized by UGC-MM-TTP of RTMNU, Nagpur, from 16th March to 30th March 2025.
- Participated in Five Day International Faculty Development Programme on "AI in research and Innovation" , August 18-22, 2025 at L. A. D. & Smt. R. P. College for Women, Nagpur in Collaboration with Yshwantrao Chavan College of Engineering, Nagpur.
- Participated in the Two Day Faculty Workshop under Anusandhan National Research Foundation (ANRF) organised by VNIT, Nagpur on 1st and 2nd March 2026.
- Visit to Atomic Minerals Division, Department of Atomic Energy, Atomic Energy Directorate organized by IWSA on 11th March 2026.

❖ Papers Presented in Conferences / Seminars

- "XANES features in fluoromethanes and electronegativity"(poster presentation), National Seminar on X-ray Spectroscopy, Department of Physics, Nagpur University, Nagpur, India, October 16-18, 1995.
- "Study of low energy satellites in the k spectra of some 3d transition metals and their compounds using Pelletron facility" (oral presentation in the technical session), Workshop on High Resolution X-ray and Auger Electron Spectroscopy with High Energy Heavy Ion Beams, Nuclear Science Center, New Delhi, India, February 26, 1996.
- "Dependence of rotational constants of homonuclear and intragroup diatomic molecules on electronegativity" (oral presentation in the scientific session), 68th Annual session of the National Academy of Sciences, India held at Central drug research Institute, Lucknow, India, October 23-25, 1998.
- "Dwi-anvik renoonchya parivalan parimananche anvik electronegativitychya aadhare susootrikaran", (oral presentation in Marathi in the scientific session), Marathi Vidnyan parishad's 34th 'Akhil Bharatiya Marathi Vidnyan Sammelan' held at Nagpur, India, October 23-25, 1999.
- "Study of carbon k absorption edge and XANES using synchrotron radiation of INDUS-I" (oral presentation at the scientific session), Annual School on Science with

Synchrotron radiation held at Center for Advanced Technology, Indore, India, January 27- February 2, 2000.

- "Systematization of data on rotational constants and bond force constants of diatomic molecules using electronegativity" (oral presentation in the scientific session), Seminar on Glimpses of the X-ray studies in Nagpur and Future Perspectives held at Department of Physics, Nagpur University, Nagpur, India, 31st January 2003.
- 'Health of Women: A Major Concern of Modern Times' presentation in "Kanyaka Conference" organised by Dharampeth M. P. Deo Memorial Science College, Nagpur Dt. 21 November 2009.
- Oral Presentation at UGC Sponsored National Symposium 'Nanotrends 2009-10', organised by Dharampeth M. P. Deo Memorial Science College, Nagpur.
- National Conference on Technologies in Engineering and Science for Energy Applications (NCTESEA-2012) to be held at Dr. Ambedkar College, Nagpur during 2nd & 3rd January 2012.
- 'Use of nano-size Zinc Oxide in Glasses' presentation for the conference on Nano Science and Technology, February 21-22, 2011 organised by Science College, Congress Nagar, Nagpur.
- Dr. Vaijayanti G. Asolkar made an Oral Presentation on 'Growing Use of Nano-Materials in Personal Care Products: Some Concerns' in the NationalConference "MACRO TECHNEVISTA" on "Recent Advances in Polymer Science & Technology" at Laxminarayan Institute of Technology, RTM Nagpur University, Nagpur. 23-24 January 2015.
- Dr. Vaijayanti G. Asolkar participated and made an Oral Presentation on "Communication in Science with Special Reference to Language" in LAD Roundtable -2015 on "The Role of Language in the Perceptual Processes" underthe aegis of the Research and Development Cell, 20 March 2015.
- Dr. Vaijayanti G. Asolkar delivered an invited lecture on "Telescopes for Astronomy" in the Introductory Level Certificate Course in Astronomy and Astrophysics, at Dr. Ambedkar College, Deekahsabhoomi, Nagpur. 2 September 2015.
- Dr. Vaijayanti G. Asolkar delivered a lecture on "Big data" in UGC Refresher Course in ICT Application, conducted by UGC Human resource Development Centre, RTM Nagpur University, Nagpur. 3 October 2015.

- Dr. Vaijayanti G. Asolkar delivered a lecture on “Use of ICT in teaching-learning” in UGC Refresher Course in ICT Application, conducted by UGC Human resource Development Centre, RTM Nagpur University, Nagpur. 13 October 2015.
- Applications of Nano-materials in Pollution Control’ Oral presentation in in ‘National Conference Green Earth Clean Earth’ organised by L.A.D. & Smt. R.P. College for Women, Nagpur on 10th February 2024.
- Dr. V. G. Asolkar delivered an invited lecture on 14/02/2024 on the topic ‘Ultarsaound, Sonography and Ventillator’ in Certificate Course on Biomedical Instrumentation organised by Dr. Ambedkar College , Deekshabhoomi, Nagpur

❖ Workshops / Seminars / Conferences Organized:

- Workshops organised for students of B. Sc. Regarding development of soft skills, curricular and co-curricular activities , alumnae-student connect for students of B. Sc.

❖ Administrative Responsibilities

- Head, Department of Physics
- Supervisor, Faculty of Science and Technology
- Coordinator and convener of several college level committees.
- Officer In Charge, 2012 Winter examination of R.T. M. Nagpur University
- Officer in charge, 2022 Valuation Centre (of Winter 2022 Examination) L. A. D. & Smt. R. P. College for Women, Nagpur.
- Officer in charge, Winter 2025 Examination at center L. A. D. & Smt. R. P. College for Women, Nagpur. (20 December 2025 - 27 February 2026).

❖ Membership of Professional Bodies

- Life Member, Indian Science Congress
- Life Member, Indian Women Scientists Association
- Life Member, Vidarbha University Physics Teachers’ Association
- Life Member, UWAN (University Women’s Association, Nagpur)
- Life member Indian Federation of University Women's Associations

❖ Awards / Recognitions:

- School on the Use of Synchrotron Radiation in Science and Technology: 'John Függle Memorial' held at International Centre for Theoretical Physics (ICTP), Trieste, Italy. October 31 - December 5, 1997. This training was fully funded by IAEA (International Atomic Energy Agency) and UNESCO.
- Teacher's Fellowship under the FDP (Faculty Development Programme), IX Plan of the UGC (University Grants Commission, India) during the period 01 July 1999 to 30 June 2001.
- Dr. V. G. Asolkar has served as convener/member of various institutional committees such as academics, examinations, library, scholarships, mentorship, and student welfare. She has contributed to organizing several national seminars and conferences.
- Dr. V. G. Asolkar has been a member of the Board of Studies and Special Task Committee of R.T.M. Nagpur University, and served on faculty selection panels as subject expert and Vice-Chancellor's nominee.
- Extension Activities / Community Engagement:
- A passionate science communicator, Dr. Vaijayanti Asolkar has delivered numerous invited popular science lectures and served as a resource person in UGC Refresher Courses. She has actively contributed to the popularization of science, environmental awareness, and elderly care.
- During the years 2015–2017, she wrote nearly 100 articles on eminent women physicists in *The Hitavada's* children's weekly magazine '*Twinkle Club'*, under the popular "Physics Corner" column.
- She organizes student-centric activities such as seminars, science quizzes, exhibitions, and mentoring sessions

❖ **E-Content / MOOCs / ICT Use: Use of ICT in teaching-learning process from the following platforms**

- Free/open resource material from renowned universities like MIT, USA, CALTECH, USA

❖ Other Relevant Information

- Dr. V. G. Asolkar participated in the School on the Use of Synchrotron Radiation in Science and Technology: 'John Függle Memorial' held at International Centre for Theoretical Physics (ICTP), Trieste, Italy. This training was fully funded by IAEA (International Atomic Energy Agency) and UNESCO. Under this programme, she had opportunity to visit the Italian Synchrotron Facility 'Elettra'
- Dr. V. G. Asolkar participated in the School on the Use of Synchrotron Radiation of INDUS I and II, the Synchrotron Facility at Centre for Advanced Technology (CAT), Indore and made oral presentation about XANES and EXAFS of halomethanes using synchrotron radiation of INDUS –I.
- Details of research grants/fellowships awarded:
- Teacher's Fellowship under the FDP (Faculty Development Programme), IX Plan of the UGC (University Grants Commission, India) during the period 01 July 1999 to 30 June 2001.
- Dr. Vaijayanti G. Asolkar has served as convener/member of various institutional committees such as academics, examinations, library, scholarships, mentorship, and student welfare. She has contributed to organizing several national seminars and conferences.
- She has been a member of the Board of Studies and Special Task Committee of R.T.M. Nagpur University, and served on faculty selection panels as subject expert and Vice-Chancellor's nominee.

❖ Research Contributions:

- Dr. Asolkar's research spans atomic and molecular structure, bonding, optics, nanomaterials, and X-ray absorption spectroscopy (XANES/EXAFS), particularly using synchrotron radiation. Her research contributions include original estimations of inter-nuclear distances in several diatomic molecules and C-F bond lengths in fluoro-methanes which have been internationally recognized and cited in the *CRC Handbook of Chemistry and Physics*. She has published extensively in reputed international journals and presented her work at numerous academic conferences.

• Social Impact of Work:

- A passionate science communicator, Dr. Asolkar has delivered numerous invited popular science lectures and served as a resource person in UGC Refresher Courses. She has actively contributed to the popularization of science, environmental awareness, and elderly care.
- From 2015–2017, she wrote nearly 100 articles on eminent women physicists in *The Hitavada's* children's magazine *Twinkle Club*, under the popular "Physics Corner" column.
- She organizes student-centric activities such as seminars, science quizzes, exhibitions, and mentoring sessions. She has represented Maharashtra in the XIX All India Civil Services Swimming Meet and has won several prizes in essay writing, debates, dance, and dramatics.

❖ Awards and achievements:

- Dr. V. G. Asolkar participated in the School on the Use of Synchrotron Radiation in Science and Technology: 'John Függle Memorial' held at International Centre for Theoretical Physics (ICTP), Trieste, Italy. This training was fully funded by IAEA (International Atomic Energy Agency) and UNESCO. Under this programme, she had opportunity to visit the Italian Synchrotron Facility 'Elettra'

Details of research grants/fellowships awarded:

- Teacher's Fellowship under the FDP (Faculty Development Programme), IX Plan of the UGC (University Grants Commission, India) during the period 01 July 1999 to 30 June 2001.
- Dr. V. G. Asolkar has served as convener/member of various institutional committees such as academics, examinations, library, scholarships, mentorship, and student welfare. She has contributed to organizing several national seminars and conferences as member/convener of various committees for the same.
- Dr. V. G. Asolkar has worked with X-ray generators, Bent Crystal Cauchios Spectrograph and CZ Microdensitometer and other X-ray instruments used in diffraction and X-ray spectroscopic work. She is also conversant with computational techniques required in such work.
- Dr. V. G. Asolkar has done short term courses in computer programming for scientists and engineers. She is comfortable in working with computers in

WINDOWS/LINUX environment. She has also been working with different word processing, graphics and computational software.