*Dr. Rajeev K. Pathak* Brief Curriculum Vitae

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| ­ADDRESSDr. Rajeev K. PathakE-17, Apartment 205, Brahma Memories , Bhosale Nagar Pune-411007 Maharashtra State India – 411007Tel: **+91 992 191 5235** (CELL, INDIA)Tel: **+91 202 556 0262** (LANDLINE, INDIA)Tel: **+1 619 512 6975** (U.S.A.): when on visitE-mail: **snehalandrajeev****@gmail.com** | EDUCATION1982-1987; 1992, 1997 **Postdoctoral Research** ***University of North Carolina****, Chapel Hill, NC, USA;* ***Tulane University****, New Orleans, LA, USA;****University of New Brunswick****, Fredericton, NB, Canada;* (again---)***Tulane University****, New Orleans, LA, USA*October 1982 **Ph.D.** in **Physics** *Department of Physics, University of Poona, Pune, MH, India*June 1978 **M.Sc.** in **Physics***Department of Physics, University of Poona* June 1976 **B.Sc.** in **Physics***Fergusson College, University of Poona* |
| CAREER SUMMARY • Physics teacher at the College and University levels with over 20 years experience in teaching core (basic) physics courses:  (i) Introductory physics at the undergraduate level in a liberal arts set-up, in U.S.A;and  (ii) Basic physics courses and elective theoretical physics courses at the graduate and post-graduate (master’s and beyond) level, in India. • Research experience of over 33 years in Atomic and Molecular physics, in the fields of: many-electron problems, density functional theory, electron momentum distributions, mathematical physics, molecules and molecular nano-clusters: hydration of clusters, hydrogen bonding, clusters interacting with external fields.   • Advising doctoral and master’s degree students; writing and obtaining grants for research projects.***Education***: Doctoral (Ph.D.); Postdoctoral Research (---chiefly in U.S.A.). ComputationFortran (conversant), C, C++; Linux, Windows | CAREER OBJECTIVE• To educate; to elucidate; to bring out the excitement in learning physics. To apply effectively the maxims of physics to diversified problems and phenomena. Invoke physical thought process in students. To ‘instill’ a holistic viewpoint in studying physics.• To demystify physics (most physics principles do not ‘fall in’ one’s lap serendipitously!). To add human element to teaching. Demonstrate what a theme *is* about and also what it is *not*• Research in Atomic, Molecular and Optical Physics, Chemical Physics, Mathematical Physics; PT-symmetric systems. |

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| POSITIONS**2007: Visiting Professor** Department of Physics, Tulane University (TU), **New Orleans, LA, USA** **1989-2017: Professor**Department of Physics, Savitribai Phule Pune University (SPPU), **Pune, MH, India** | PUBLICATIONS**Research Papers: *Sixty-five* (65) *Research articles*** *hitherto****,*** *i****n*** *peer-reviewed* ***International Journals*** *of high impact****.*** **Conference Proceedings:** Numerous Presentations at International Conferences **Book---*“PSI”* of relief!:** ***“E”- Book*** in the form of compilation of a set of companion notes on interpreting the quantum mechanical wave function: For a beginner aspiring to step into the quaint domain of Quantum Mechanics (**FREEWARE!**)----**Please follow the link:**[**http://physics.unipune.ac.in/~pathak/Rajeev\_K\_Pathak\_Psi\_of\_Relief\_Complete\_Set\_2013\_OCT\_05.pdf**](http://physics.unipune.ac.in/~pathak/Rajeev_K_Pathak_Psi_of_Relief_Complete_Set_2013_OCT_05.pdf) |
| ACCOLADES***Member, International Advisory Board*** for Strongly Correlated Electron Systems: Density Functional Theory segment.***Senior Associate****,* ***International Center*** for Theoretical Physics, Trieste, Italy***Indo-US IUSSTF Visiting Professorship*** to the City University of New York, NY, U.S.A.; Awarded by the **American Physical Society (2010)*****National Career Award*** Awarded by **University Grants Commission, New Delhi, India** PERSONAL***Nationality*** (East) Indian***Languages*** English (Excellent), Hindi (workable) Marathi (Excellent: Mother tongue) Sanskrit (feeble); German (feeble),  Italian (feeble)***Hobbies***  Hiking, Trekking, Jogging, Weight-training, Karate, Reading, Amateur Star gazing, studying Astronomy | REFERENCES**1. Professor Dr. John P. Perdew*****Laura H. Carnell Professor of Physics and Chemistry***Departments of Physics and Chemistry Room 407, Barton Hall, Main CampusTemple University Philadelphia, PA 19122-6082 U. S. A.*E-mail:* perdew@temple.eduTel: (856) 325-8302 [Cell Phone]**2. Professor Dr. Libero J. Bartolotti**Department of Chemistry,East Carolina UniversityScience and Technology BuildingSuite 300, Greenville,North Carolina 27858-4533U. S. A. *E-mail:* bartolottil@ecu.eduTel: (252)-328-9762 [Land Line]**3. Professor Dr. James H. McGuire** Department of Physics and AstronomyPhysics & Engineering Physics School2001 Percival Stern Hall, Tulane University,  New Orleans, Louisiana-70118  U. S. A.*E-mail:* mcguire@tulane.eduTel: (941) 966 5632 [Cell Phone] |

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| ­MEMBERSHIP***American Physical Society******American Chemical Society******Maharashtra Academy of Sciences, Elected******Indian Physics Association, Life Member******Amateur Astronomers, (JVP) Pune, India: Life Member*** |
| TEACHING **Graduate (Master’s) level:**Have been working as a Professor of Physics at the Department of Physics, University of Pune, Pune, India. Have taught 4 (four) full courses in Quantum Mechanics at introductory, intermediate and advanced levels and a special course on Introductory Quantum Electrodynamics. Further, have taught two full courses on Classical Electrodynamics. Also, have conducted a large number of problem solving sessions for Master’s Degree students for the subjects: Classical Mechanics, Quantum Mechanics, Statistical Mechanics and Electrodynamics**Undergraduate level**:***\* Teaching carried out in the United States of America:***During the Spring Semester of 2007 (January-July, 2007) I was offered a visiting professorship at the Department of Physics, Tulane University, New Orleans, Louisiana-70118, U.S.A. I taught undergraduate physics courses PHYSICS 122–Section 01, PHYSICS 122–Section 02, PHYSICS 122–Section 03, an algebra-based non-calculus course to the above three classes (sections). The prescribed text was Cutnell and Johnson’s Introductory Physics. The student community included a substantial contingent of pre-medical students. American Physical Society’s Visiting Professorship award (IUSSTF) bestowed upon me in 2010, visited the City University of New York system; taught “Density Functional Theory” and allied aspects.Visiting Research Scientist: Indiana University, IUPUI, Indianapolis, IN, U.S.A.: 2014, 2015  | RESEARCH Engaged in research in theoretical Physics within the field “***Density Functional Theory***”, an exact general formalism for atoms, molecules and solids. Have been engaged in **formal** **developments** as well as applications of theory. Worked with Atomic and molecular ***Electron Momentum Densities***. ***Positron States***: Rigorous Mathematical results, and applications.  ***Electronic exchange and correlation*** effects in atoms in both position and momentum spaces.  ***Rigorous inequalities*** in atomic and molecular physics. ***Intermolecular potential energy surfaces***. Derived some exact Theorems and mapped the ***Electrostatic Potentials for molecules***. Structure and properties of ***Density - Matrices in co-ordinate and momentum spaces***.  Estimated Critical Exponents in ***High-Tc superconductivity*** via a theoretical model. “***Compton Defect***” **within** the Kohn-Sham approach. ***New Koopmans’ Theorems*** and ***Indirect-paths*** for accurate atomic energies. ***Ab initio*** studies on **Water anionic clusters**. **Hydrogen-bonded clusters** and their response to **external electric fields**. ***Molecular Electronic Stark Effect***: Predicted for the first time **PT**-***symmetric Hamiltonian*** with temporal periodicity and the Rabi problem: Signal growth and attenuation. ***PT on a cylinder*** and ***Lattice*** with balanced gain-loss and Signal customization. |

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| GRANTS**Seven (7) Major Research Grants were sanctioned:** **University Grants Commission, New Delhi, India****Research Grant: (Major Research Project)****“Compton *Defect*:: a Density Functional Approach”****University Grants Commission, New Delhi, India****Career Award Research Grant: (Major** **Research Project)****“*Density Matrices in Coordinate and Momentum Spaces*”*****Indo-US Collaborative Research Grant* with East Carolina University, with Professor Dr. Libero Bartolotti: Hydrogen-bonded Clusters; their Hydration and Molecular Cooperativity.****Special University Research Grants (University Potential for Excellence):****RG – 09****RG – 10****RG – 14****For investigations on “*Hydrogen-bonded nano-clusters, their stability, hydration and Interactions with an External Electric Field*”****Special Research Grant for *Supercomputing on PARAM Supercomputer*; Grant by The Center for Advanced Computing, Pune, MH, India.** | *MOST RECENT PAPERS**(Total Research Publications = 65)****“#” implies ---serial number in the complete CV*** ***# 60.*** ***Exactly solvable PT symmetric models in two dimensions****\* K.S. Agarwal, R.K. Pathak, and Y. N. Joglekar****Europhysics Letters******112(3),*** *31003 (2015).****#61.******Encaged molecules in external electric fields: a molecular 'tug-of-war'****\* N.D. Gurav, S.P. Gejji, L.J. Bartolotti, and R.K. Pathak****Journal of Chemical Physics******144****, 201101 (2016).****#62. Growing the PT transition threshold by strong coupling to neutral chains****\* K. S. Agarwal, R. K. Pathak, and Y. N. Joglekar* ***Physical Review-A 97****, 042107 (2018).* ***#63. Electronic Stark Effect for a Single Molecule: Theoretical UV Response****\* N.D. Gurav, S.P. Gejji and R.K. Pathak****Computational and Theoretical Chemistry (Elsevier) 1138,*** *23-28 (2018).****#64. Rotatory Response of Molecular Electron Momentum Densities in Linear, Homogeneous Weak Electric Fields : A Topographical Analysis*** *\* M. Paul, R. K. Pathak, and B. Pananghat****Journal of Physics Chemistry A:****,* ***Accepted Manuscript*** *•* ***Journal of Physical Chemistry A 124****, 943-954 (2020).****#65. ‘Striped’ Rectangular Rigid Box with Hermitian and******non- Hermitian PT–Symmetric Potentials*** *\* S. Kulkarni and R. K. Pathak* ***Journal of Mathematical Physics (AIP):*** *Accepted for publication (2021)***# Under preparation:** *1. PT-Symmetry on a Lattice**2. Current in Relativistic Density Functional Theory* **Kindly refer to the list of research publications as Appendix-A to the complete, EXTENDED CURRICULUM VITAE --- also available through following the LINK:** <http://physics.unipune.ac.in/~pathak/>  |