

AMIT GOYAL
Assistant Professor
Department of Physics
GGDSD College Chandigarh
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DOB: 2nd June 1985



- Educational Qualifications**
- Ph.D. in Nonlinear Physics**
Department of Physics, Panjab University Chandigarh, India (2009-2014)
Qualified JRF-CSIR in Physical Sciences (2009)
 - M.Sc. (Physics)** - Department of Physics, IIT Bombay, India (2006-08)
 - B.Sc. Hons. School (Physics)** - Department of Physics, Panjab University Chandigarh, India (2003-06)
- Teaching Experience**
- 07 August 2014 - till date
Assistant Professor in Department of Physics, GGDSD College, Chandigarh
 - July 2008 - March 2009
Lecturer in Physics in BIS College of Engineering & Technology, Moga
- Research Experience**
- **Post-Doctoral Fellow** (June - August 2014)
Topic: PT-symmetric optics
 - **Ph.D.** (2009 - 2014)
Thesis Title: Study of nonlinear evolution equations with variable coefficients for solitary wave solutions.
Supervisors: Prof. C. N. Kumar and Dr. Sunita Srivastava, Department of Physics, Panjab University.
 - **M.Sc. Dissertation Project** (July 2007 - May 2008)
Title: Electronic structure of carbon nanotubes.
Supervisor: Prof. P. P. Singh, Department of Physics, IIT Bombay.
- Research Project**
- “**Nonlinear excitations in PT-symmetric optical waveguides: Modulational instability, solitons and rogue waves**”, funded by Science and Engineering Research Board (*SERB*) under *Early Career Research Award Scheme*.
Amount Sanctioned: Rs. 19.96 Lakh
Duration: 2016-19
Manpower: 1 JRF
- Awards/Fellowships**
- **Travel Grant - ICTP**, Italy, 2015
 - **Travel Grant - ICTP**, Armenia, 2014
 - Young Scientist **Foreign Travel Grant - DST**, Italy, 2013
 - Young Scientist **Foreign Travel Grant - CSIR**, Taiwan, 2012
 - **Senior Research Fellowship - CSIR**, 2012
 - **Junior Research Fellowship - CSIR**, 2009
 - **AIR 31 in JAM-2006**, Joint Admission Test for M.Sc. at IIT's
 - **Merit Certificate in Matriculation Examination**, National Scholarship Scheme, 2001
- Areas of Interest**
- Nonlinear Physics, Solitons / Solitary Wave Solutions for wave propagation in nonlinear media - Nonlinear fiber optics, Bose Einstein Condensates, Water Waves

Publications
(Journal/Book Chapters)

Journal Publications: 32
Book Chapters: 03

* A comprehensive list of my recent work can be found on [scholar](#) and [Vidwan portal](#).

Selected Publications:

- S. Bhatia, **A. Goyal**, S. Jana and C.N. Kumar, Stationary hypergeometric solitons and their stability in a Bose-Einstein condensate with PT-symmetric potential, *Phys. Lett. A* 469 (2023) 128751.
- N. Maan, S. Bhatia, **A. Goyal** and C.N. Kumar, Propagating chirped Lambert W-kink solitons for ac-driven higher-order nonlinear Schrödinger equation with quadratic-cubic nonlinearity, *Eur. Phys. J. Plus* 137 (2022) 519.
- R. Gupta, **A. Goyal**, The Insights into Richness of Nonlinear Schrödinger Equation. In: S. Zdravković, D. Chevzovich (eds) Nonlinear Dynamics of Nanobiophysics. Springer, Singapore (2022). ISBN 978-981-19-5323-1
- S. Pathania, H. Kaur, **A. Goyal**, C.N. Kumar, Controlled self-similar matter waves in PT-symmetric waveguide, *Phys. Lett. A* 384 (2020) 126574.
- R. Pal, H. Kaur, **A. Goyal** and C. N. Kumar, Dynamics of Jacobi elliptic and soliton solutions for the modified quadratic-cubic nonlinear Schrödinger equation, *J. Mod. Opt.* 66 (2019) 571.
- **A. Goyal**, T. S. Raju, C. N. Kumar and P. K. Panigrahi, The effect of different background beams on the optical rogue waves generated in a graded-index waveguide, *Opt. Comm.* 364 (2016) 177.
- K. K. De, **A. Goyal**, T. S. Raju, C. N. Kumar and P. K. Panigrahi, Riccati parameterized self-similar waves in two-dimensional graded-index waveguide, *Opt. Comm.* 341 (2015) 15.
- **A. Goyal**, R. Gupta, C. N. Kumar, T. S. Raju and P. K. Panigrahi, Controlling optical similaritons in a graded-index nonlinear waveguide by tailoring of the tapering profile, *Opt. Commun.* 300 (2013) 236.
- **A. Goyal**, R. Gupta, S. Loomba and C. N. Kumar, Riccati parameterized self-similar waves in tapered graded-index waveguides, *Phys. Lett. A* 376 (2012) 3454.
- C. N. Kumar, R. Gupta, **A. Goyal**, S. Loomba, T. S. Raju and P. K. Panigrahi, Controlled giant rogue waves in nonlinear fiber optics, *Phys. Rev. A* 86 (2012) 025802.

Peer Reviewer

Scientific Reports, The European Physical Journal Plus, Physica Scripta, Results in Physics, Journal of Nonlinear Optical Physics & Materials, Nonlinear Dynamics, and Journal of Physics B

Invited Talks

- Resource person in the Hands-on Workshop on “Analytical and Numerical Methods for Soliton”, Thapar Institute of Engineering & Technology, Patiala (August 5-6, 2023).
- Expert lecture in DBT Sponsored “Hands-on Workshop on LATEX Software” held on April 3, 2023 in the Department of Physics, GGSDS College (April 3, 2023).
- Invited talk on *Optical rogue waves in spatially modulated nonlinear waveguide*, 9th Conference on Nonlinear Systems and Dynamics, IISER Mohali (March 13-15, 2015).
- Invited talk on *Modulated optical similaritons and self-similar rogue waves in nonlinear waveguides*, ICTP 2nd International Symposium on “Optics and its Applications”, Russian-Armenian University, Yerevan, Armenia (Sept. 1-5, 2014).
- Seminar talk on *Controlling optical similaritons and rogue waves in nonlinear fiber optics*, IISER Pune, India (April 16, 2013).

**Seminars/
Conferences/Symposiums
(Paper Presented)**

- Applications of solitons in optical communication systems, *6th National Conference on Recent Advances in Materials Science (RAMS 2024)*, Department of Physics, GGSDS College, Chandigarh, October 16, 2024.
- Optical frequency comb solutions of driven dissipative nonlinear Schrödinger equation, *5th National Seminar on Recent Advances in Materials Science (RAMS 2022)*, Department of Physics, GGSDS College, Chandigarh, September 30, 2022.
- Optical soliton dynamics in the advancement of optical communication systems, ICSSR Sponsored National Seminar on *Recent Trends in Information Technology*, PG Department Information and Technology, GGSDS College, Chandigarh, March 25, 2022.
- Modulational stability analysis of constant amplitude waves in PT-symmetric nonlinear optical waveguide, *International Conference on Applied Nonlinear Analysis & Soft Computing*, Department of Mathematics, Gauhati University, December 22-23, 2020.
- Self-similar optical pulses in PT-symmetric complex potential, *4th National Seminar on Recent Advances in Material Science (RAMS-2020)*, Department of Physics, GGSDS College, Chandigarh, February 1, 2020.
- Driven constant amplitude waves in PT-symmetric optical materials, International Conference on Advanced Materials (ICAM 2019), Nirmalagiri College, Kannur, Kerala, June 12-14, 2019.
- Nonlinear localized excitations in PT-symmetric optical wavelength, *National conference on Nonlinear Phenomena in Physics*, Guru Nanak Dev University, Amritsar, March 1-2, 2019.
- Constant intensity waves in modulated graded-index waveguides, *Two Day International Conference on Advances in Mathematical, Physical and Computer Sciences (ICAMPCS-2018)*, SGGGS Khalsa College, Mahilpur, February 12-13, 2018.
- Optical rogue waves generated on different background beams in the presence of external source, *11th Chandigarh Science Congress*, Panjab University, Chandigarh, March 09-11, 2017.
- Optical rogue waves in nonlinear graded-index waveguide, *Hands-On Research in Complex Systems*, International Centre for Theoretical Physics (ICTP), Trieste, Italy, 28 June–11 July, 2015.
- Optical rogue waves in spatially modulated nonlinear waveguide, *9th Conference on Nonlinear Systems and Dynamics*, IISER Mohali, March 13-15, 2015.
- Self-similar rogue waves in Airy-Bessel modulated nonlinear media, *9th Chandigarh Science Congress*, Panjab University, Chandigarh, Feb. 25-27, 2015.
- Modulated optical similaritons and self-similar rogue waves in nonlinear waveguides, *ICTP 2nd International Symposium on “Optics and its Applications” (OPTICS-2014)*, Russian-Armenian (Slavonic) University, Yerevan, Armenia, Sept. 1-5, 2014.
- Modulating self-similar waves in a tapered graded-index waveguide, *Workshop on Recent Advance in Photonics*, IIT Delhi, India, Dec. 17-18, 2013.
- Generalized self-similar solutions of cubic-quintic nonlinear Schrödinger equation with variable coefficients, *8th Conference on Nonlinear Systems and Dynamics*, IIT Indore, India, Dec. 11-14, 2013.
- Double-kink and Lorentzian-type similaritons in graded-index nonlinear waveguide with cubic-quintic nonlinearity, *International Workshop on Singularities and Topological Structures of Light*, ICTP, Trieste, Italy, July 08-12, 2013.
- Controlling optical rogue waves in tapered graded-index waveguides, *7th Chandigarh Science Congress*, Panjab University, India, March 01-03, 2013.
- Optical solitons supported by localized gain in the presence of two-photon absorption, *International Conference on Fiber Optics and Photonics*, IIT Madras, India, Dec. 09-12, 2012.

- Chirped bright and dark solitary wave solutions in nonlinear negative index materials, *Dynamic Days Asia Pacific 7 - The 7th International Conference on Nonlinear Science*, Academia Sinica, Taipei, Taiwan, Aug. 05-09, 2012.
- Soliton solutions of complex Ginzburg-Landau equation driven by external force, *7th National Conference on Nonlinear Systems and Dynamics*, IISER Pune, India, July 12-15, 2012.
- Soliton-like solutions for higher order nonlinear Schrödinger equation, *6th Chandigarh Science Congress*, Panjab University, Feb. 26-28, 2012.
- Dynamics of a nonlinear model for DNA, *5th Chandigarh Science Congress*, Panjab University, Feb. 26-28, 2011.
- Solitary wave solutions of nonlinear reaction-diffusion equations with variable coefficients, *6th National Conference on Nonlinear Systems and Dynamics*, Bharathidasan University, India, Jan. 27-30, 2011.
- Nonlinear dynamics of elastic rods and application to DNA, *55th Congress of ISTAM*, NIT Hamirpur, India, Dec. 18-21, 2010.
- Solutions of sine-Gordon-type equations using algebraic method, *4th Chandigarh Science Congress*, Panjab University, March 19-20, 2010.

**Refresher
Courses/Workshops/
Training Programmes**

- Attended online *NEP 2020 Orientation and Sensitization Program* from May 20 - 30, 2024 organized by MMTTC, Panjab University, Chandigarh.
- Participated in *National Workshop on Quantum Physics "Alice in Quantumland"* (online mode) held from April 9-14, 2024 organized by Kanya Maha Vidyalaya, Jalandhar in association with Indian Association of Physics Teachers.
- Participated in FDP cum Workshop entitled "One-week Faculty Development Programme on Computational Modelling of Materials (online mode) on May 8-12, 2023, organized by the Department of Physics, Madanapalle Institute of Technology and Science, Madanapalle.
- Participated in the *Workshop on Stochastic Thermodynamics - WOST IV* (online mode) organized by ICTP, Trieste, Italy from May 18-26, 2023.
- Attended FDP on "NEP-2020 and Ethical Paradigms in pedagogy" from June 21-27, 2022 organized by the UGC-HRDC, Panjab University, Chandigarh under RUSA 2.0 grant, held at Goswami Ganesh Dutta S.D. College, Chandigarh.
- Attended an online FDP on "Research in Sciences: Novel tools and Methodologies" from August 3-9, 2021 organized by the UGC-HRDC, Panjab University, Chandigarh under RUSA 2.0 grant, held at Sri Guru Gobind Singh College, Chandigarh.
- Attended seven days webinar series faculty development programme on "Beyond Academic Excellence - A Reality Show" organized by Nallamuthu Gounder Mahalingam College (Autonomous), Coimbatore, Tamil Nadu during May 25-31, 2020.
- Attended five days faculty development programme "Hands on FDP: Data Science using Python" organized by Jeppiaar Institute of Technology, Sriperumbudur, Tamil Nadu during May 18-22, 2020.
- Attended one-week faculty-cum-student skill development programme on "Biological Data Analysis & Data Science" organized under Rashtriya Uchchatar Shiksha Abhiyan (RUSA) DHE Chandigarh Administration by Department of Bioinformatics and Biochemistry, GGSDS College, Chandigarh during Feb 27-March 04, 2020.
- Participated in the Refresher Course on "India Studies" at the Human Resource Development Centre, Punjab University, Chandigarh from October 10-23, 2019.
- Participated in 118th Orientation Course at UGC HRD Center, Punjab University, Chandigarh from May 1-28, 2018.
- Attended Workshop and Training Programme on "Automation System in Education Sector" at GGSDS College, Chandigarh from March 08-09, 2016.
- Participated in the seminar program Inside Raman 2015 organized by Renishaw Metrology Systems Limited at the IISER Mohali from December 10-11, 2015.

- Attended Faculty Development Workshop held at GGSDS College, Chandigarh on November 22, 2014.
- Participated in the *International Seminar on Current Trends in Quantum Gases, BEC and Solitons* held at Dept. of Physics, Panjab University, India during March 03-06, 2014.
- Attended the *DST - SERC School on Nonlinear Dynamics* during Jan. 27 - Feb. 18, 2014 held at the Dept. of Physics, Panjab University, India.
- Participated in the *Advanced Workshop on Nonlinear Photonics, Disorder and Wave Turbulence* held at ICTP, Trieste, Italy from July 15-19, 2013.
- Participated in the *3rd DAE - BRNS Symposium on Atomic, Molecular and Optical Physics* held at IISER Kolkata, India from Dec. 14-17, 2012.
- Attended the *Workshop on Parallel Computing using HPCC* organized by Dept. of Physics, Panjab University, India from March 02-03, 2012.
- Participated in the *International Workshop on Structure and Dynamics of Trapped Quantum Gases* held at Dept. of Physics, Panjab University, India during Feb. 02-04, 2012.
- Participated in the two-day seminar programme on *Trends in Frontier of Physics* held at Dept. of Physics, Panjab University, India during Feb. 15-16, 2011.
- Attended the *DST - SERC School on Nonlinear Dynamics* during January 04-26, 2011 held at the Centre for Nonlinear Dynamics, School of Physics, Bharathidasan University, India.
- Participated in the *TPSC Advanced Research Workshop* organized by University of Pune, India during Feb. 15-18, 2010.

PhD Thesis

Degree awarded:01

Currently Supervising:02

Administrative Experience

- **Associate Editor - IAPT Bulletin**
(A Monthly Journal published by the *Indian Association of Physics Teachers*)
- **Sub-Registrar (Science)** since November 01, 2023.
- Organizing secretary for the 6th, 7th & 10th *IAPT National Student Symposium on Physics* held at the Department of Physics, Panjab University in 2018, 2019 & 2023, respectively.
- Organizing secretary for the 1st & 3rd *National Seminar on Recent Advances in Physics* held at GGSDS College in 2021 & 2023, respectively.
- **Treasurer, IAPT RC-03**, for the period 2022-24.
- Executive Member, IAPT RC-03, for the period 2019-21.
- **Superintendent** - PU Semester Examination, July 2021, Feb. 2021 & Dec. 2019.
- **Organized Educational Tour**
 - ❖ *CSIR-IHBT Lab and Science Center, Palampur* (20-23 March 2024).
 - ❖ *Aryabhata Research Institute of Observational Sciences (ARIES), Nainital* (19-23 Feb 2020).
 - ❖ *Infrared Observatory, Mount Abu* (17-21 March 2017).

Membership of Academic Associations

- Life Member, *Indian Association of Physics Teachers*
- Life Member, *Optical Society of India*

Amit Goyal