

Curriculum Vitae

DR. BISWAJIT SEN

Associate Professor
V T T College, Midnapore

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e-mail Id: bsen75@yahoo.co.in:

Teaching Experiences :20 years(including school)



Biography

B.Sc.[Physics (hons)] From University of Burdwan, 1995,

M.Sc.(Physics) From visva-Bharati, 2000,

Ph.D. from Visva-Bharati in 2008

M.Ed. from University of Kalyani 2009

Research

Research interest :

Quantum Optics (Nonclassical effects), Quantum information, etc.

Research Experiences: 21 years

Project (completed)

UGC Minor research project [No.F.PSW 107/10-11 (ERC)]

Students:

PhD Thesis Mentor:

1. Sandip Kumar Giri (Awarded)
 2. Parimal Ghosh (Awarded)
 3. Moumita Das (In progress)
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Awards/ Fellowship

- a. National Scholarship(VIIIth standard) 1988
- b. Merit scholarship, Visva-Bharati 1999
- c. NET, 2001
- d. GATE 2001

- e. Visiting Scientist, Palacky University & National Academy of Science, Czech Republic (October-December 2009)
- f. Visiting Scientist, KICT, IIUM, Kuala Lumpur, Malaysia (May-June 2012)
- g. Visiting Scientist, Laser and Quantum science Lab, HIR, University Malaysia, Kuala Lumpur, Malaysia (June 2013)
- h. Visiting Scientist, National University of La Plata, La Plata, Argentina (November 2014)
- i. Fuller Fund membership award from American Association of Physics Teachers (2015)
- j. TPSC- category A speaker 2015-2016
- k. INSA International visiting scientist under bilateral exchange programme 2018

List of Publications:

- 1) *Quantum phase fluctuations of coherent light coupled to a direct band gap semiconductor*, Arjun Mukhopadhyay, Mohosin Alam, **Biswajit Sen** and Swapan Manda, *Pramana [in Press]*
- 2) *Quantum statistical properties and antibunching in four-wave mixing process*, Moumita Das and **Biswajit Sen**, *Indian Journal of Multi disciplinary Academic Research*, 7 2020
- 3) *Interplay between quantum Zeno and anti-Zeno effects in a non-degenerate hyper-Raman nonlinear optical coupler*, Moumita Das, Kishore Thapliyal, **Biswajit Sen**, Jan Peřina, and Anirban Pathak, *Phys. Rev. A*, **103**, 013713 (2021)
- 4) *Interaction of light and semiconductor can generate quantum states required for solid-state quantum computing: entangled, steered and other nonclassical states*, Arjun Mukhopadhyay, Biswajit Sen, Kishore Thapliyal, Swapan Mandal, Anirban Pathak, *Quantum Inf Process* **18**, 234 (2019)
- 5) *Lower- and higher-order nonclassical features in non-degenerate hyper-Raman processes*, Kishore Thapliyal, Anirban Pathak, Biswajit Sen, Jan Peřina, *Optics Communications*, **444**, 111-119, 2019
- 6) *Bose-condensed optomechanical-like system and a Fabry{Perot cavity with one movable mirror: Quantum correlations from the perspectives of quantum optics*, Nasir Alam, Kishore Thapliyal, Anirban Pathak, Biswajit Sen, Amit Verma, and Swapan Mandal, *Eur. Phys. J. D*, **73**, 139, 2019

- 7) Lower Order and Higher Order Entanglement in Four-Wave Mixing Process, *Moumita Das, Biswajit Sen,* Ayan Ray, and Anirban Pathak, Annalen der Physik (2017), 1700160*
- 8) *Nonclassicality in an atom-molecule Bose-Einstein Condensate: Higher order squeezing, antibunching and entanglement*, Sandip Giri, Kishore Thapliyal, **Biswajit Sen**, and Anirban Pathak, *Physica A*, **466**, 140–152 (2017)
- 9) *Sum and Difference Squeezing in Second Harmonic Generation*, Arjun Mukherjee, Anamika Giri, Bipul Sarkar and **Biswajit Sen**, International research Journal of Basic and Applied Sciences, **1** (2), 39-42 (2016)
- 10) *Higher order two-mode and multi-mode entanglement in Raman processes*, Sandip Giri, **Biswajit Sen**, Anirban Pathak and Paresh Chandra Jana, *Phys. Rev. A*, **93**, 012340 (2016)
- 11) *General Higher Order Intermodal Antibunching in two-mode Bose Einstein Condensates*, Sandip Kumar Giri, **Biswajit Sen** and Paresh Chandra Jana, *Research Journal of Recent Sciences*, **5** 13-16 (2016)
- 12) *Nonclassical properties of a contradirectional nonlinear optical coupler*, Kishore Thapliyal, Anirban Pathak, **Biswajit Sen**, and Jan Perina, *Phys. Lett. A*, **378**, P 3431–3440 (2014)
- 13) *Higher-order nonclassicalities in a codirectional nonlinear optical coupler: Quantum entanglement, squeezing, and antibunching*, Kishore Thapliyal, Anirban Pathak, **Biswajit Sen**, and Jan Perina, *Phys. Rev. A*, **90**, 013808 (2014)
- 14) *Higher order nonclassicalities in a codirectional nonlinear optical coupler*, Kishore Thapliyal, Anirban Pathak and **Biswajit Sen**, *Proceedings of International Research Journal of recent sciences, Conference on Optics and Optoelectronics (ICOL) -2014, Dehradun, Paper Code- OP-NQQ-5, Page No.-286.*
- 15) *Single-mode and intermodal higher-order nonclassicalities in two-mode Bose-Einstein condensates*, Sandip Giri, **Biswajit Sen**, C H Raymond Ooi and Anirban Pathak *Phys. Rev. A*, **89**, 033628 (2014)
- 16) *Intermodal entanglement in stimulated Raman process*, **Biswajit Sen**, Sandip Giri Swapan Mandal, C H Raymond Ooi and Anirban Pathak, *Phys. Rev. A*, **87**, 022325 (2013)
- 17) *Squeezing, higher order squeezing, and photon antibunching in second harmonic generation: An analytical approach*, **Biswajit Sen**, Swapan Mandal and Jan Perina, *J. Mod. Opt.*, **Vol. 59**, p. 555-564 (2012)
- 18) *Higher-order antibunching for Pump mode in stimulated Raman Process.* **Biswajit Sen**, Bipul Sarkar and Parimal Ghosh, *Wesleyan journal of Research* Vol 5 (1) p. 8-14 (2012)

- 19) *Sub-shot noise photon number correlation in stimulated and spontaneous Raman Processes.* **Biswajit Sen**, V Perinova, J Perina, A Luks and J Krepelka, *J. Phys. B: At. Mol. Opt. Phys.* **44** (2011) 105503 (13pp)
- 20) *Squeezing and photon antibunching of the input coherent light coupled to a medium of second order nonlinearity,* **Biswajit Sen**, Swapan Mandal and Jan Perina, *Asian Journal of Physics*, **Vol.20**, p. 143-152, (2011)
- 21) *Amplitude-squared squeezing in spontaneous degenerate hyper Raman process.* **Biswajit Sen** and Swapan Mandal, *Indian Journal of Physics*, **Vol.84**, p. 1097-1102 (2010)
- 22) *Amplitude-squared and amplitude-cubed squeezing in stimulated Raman and in spontaneous Raman scattering,* **Biswajit Sen** and Swapan Mandal, *J.Mod.Opt*, **Vol.55**, p.1697 (2008)
- 23) *Comments on "nth-order squeezing of the field amplitude in Raman process as a generalization of the higher-order squeezing"* **Biswajit Sen** and Swapan Mandal, *International Journal of Modern Physics B*, **Vol.22**, p.2151-56 (2008).
- 24) *Squeezing, Photon bunching, photon antibunching and nonclassical photon statistics in degenerate hyper Raman processes,* **Biswajit Sen** and Swapan Mandal, *Journal of Physics B: Atomic, Molecular & Optical Physics*, **Vol.40**, p.2901-2916 (2007).
- 25) *Quantum statistical properties of the in spontaneous Raman and stimulated Raman processes,* **Biswajit Sen**, Swapan Mandal and Jan Perina, *Journal of Physics B: Atomic, Molecular & Optical Physics*, **Vol.40**, p.1417-27 (2007).
- 26) *Corrigendum on "Quantum statistical properties of the in spontaneous Raman and stimulated Raman processes,"* **Biswajit Sen**, Swapan Mandal and Jan Perina, *Journal of Physics B: Atomic, Molecular & Optical Physics*, **Vol.40**, p.1955-1955 (2007).
- 27) *Squeezing effects in the sum and difference of the field amplitude in the Raman process,* **Biswajit Sen** and Swapan Mandal, *Modern Physics Letters B*, Vol.21, p.1107-1110 (2007).
- 28) *Nonclassical photon statistics in spontaneous Raman and in stimulated Raman processes,* **Biswajit Sen** and Swapan Mandal, *Indian Journal of Physics*, **Vol.80**, p.545-549 (2006).
- 29) *Comments on "Higher order squeezing of the electromagnetic field in spontaneous and in stimulated Raman processes"* **Biswajit Sen** and Swapan Mandal, *J.Mod.Opt*, **Vol.53**, p. 2811-14 (2006)
- 30) *Squeezed states in spontaneous Raman and in stimulated Raman processes,* **Biswajit Sen** and Swapan Mandal, *J.Mod.Opt*, **Vol.52**, p.1789-1807 (2005).

Paper under communication

01. *Quantum phase fluctuations of coherent light coupled to a semiconductor,* Arjun Mukhopadhyay, Mohosin Alam, **Biswajit Sen** and Swapan Mandal

Paper Presented /invited talk:

- 1 Light: From Classical To Nonclassical, **Invited Speaker**, A national Conference on Recent trends in Physics, Dept. of Physics, Bankura University, 17th -18th February, 2020
- 2 How Physicist see the world, **Invited Speaker**, District level residential Science education Camp, Raja N L khan women's college, midnapore 16-18th December 2019
- 3 Quality in education in Indian Context, **Invited Speaker, International seminar on** Quality in Education: Issues & Challenges, Raja N L khan college and Rishi Aurobinda Institute of Teacher Education, Midnapore, 2nd and 3rd May, 2019
- 4 "S N Bose: Life and work" **Invited Speaker** National seminar 19th December **2018, Goaltore College**
- 5 "*Towards the effective teaching*", **Invited Speaker** Interational Seminar on Relationship and Motivational Factors in Teacher Education 12-13th January 2018 "Institute of academic excellence"
- 6 *Quantum enatanglement in Raman processes*, **Invited Speaker**, National Conference on Nonlinear Dynamics and its Applications (CNDA-16) during 07—09 February 2017, Durgapur Govt. College, Durgapur.
- 7 *Light And Its Applications in the context of Quantum World*, **Invited Speaker**, Garbeta College, Garbeta
- 8 , Multiple Fascets in coherent cascade system, Biswajit Sen, **CONFERENCE ON ENTANGLEMENT AND NON-EQUILIBRIUM PHYSICS OF PURE AND DISORDERED SYSTEMS 25 - 27 July 2016**, ICTP, Italy.
- 9 National conference on Internatioanl year of light, **Invited speaker** Midnapore College, Midnapore, 30th July, 2016
- 10 Development of quantum Optics, One day state level seminar on application of light in basic science. **Invited speaker**, Sir Gurudas Mahavidyalaya, Kolkata, India, 22nd December 2015
- 11 Photon-exciton higher order entanglement, International conference on "Light Quanta: Modern perspective & Applications, Department of Physics, University of Alllahabad, December 14th – 16th 2015
- 12 Higher Order entanglement In Raman Processes, Quantum Optics VII, Mar del Plata, Argentina, 17th – 31st October 2014
- 13 Nonclassical properties of atom-molecule BEC, Biswajit Sen, *National conference on nonlinear physics and its applications*, Darjeeling, 25th -27th November, 2013.
- 14 Possibility of nonclassical effects in two-mode Bose Einstein Condensates, **Biswajit Sen, Invited speaker**, National Conference on Physical Science, D S H K College, Dibrugarh 13th -14th September 2013.

- 15 *Elementary Quantum Optics*, **Biswajit Sen**, *Invited speaker*, Bankura Christian College, 13th September 2012,
- 16 *Nonclassical States: Key of Future Technology*, **Biswajit Sen**, *Invited speaker*, National Seminar on “50 years of Laser: Promises and Challenges” Department of Physics (UG & PG) Contai P K College, Contai, Purba Midnapore, India (2012).
- 17 *Higher order entanglement in spontaneous and stimulated Raman processes*, **Biswajit Sen**, National seminar on Photonics and Nano Sciences, Garbeta College, Garbeta, Paschim Medinipur, India (2011)
- 18 *Inter-mode entanglement in stimulated and spontaneous Raman processes*, **Biswajit Sen** and Anirban Pathak, International conference on quantum optics & quantum computing, Department of Physics and Material Science, JIIT, Noida, (2011)
- 19 *Higher order antibunching in Raman Processes*, **Biswajit Sen**, National Conference on Laser and Optical Sciences, DHSK College, Dibrugarh, (2010)
- 20 *Nonclassical Properties Atom-Molecule BEC Revisited*, Navneet K Sharma, Amit Verma, **Biswajit Sen** and Anirban Pathak, International conference on quantum optics & quantum computing, Department of Physics and Material Science, JIIT, Noida (2011)
- 21 *Amplitude-squared squeezing in spontaneous degenerate hyper Raman process*. **Biswajit Sen** and Swapam Mandal, CLBAS, Department of Physics, Visva-Bharati, (2009)