

Arpita Chatterjee

Assistant Professor

Department of Mathematics

J. C. Bose University of Science and Technology
YMCA, Faridabad 121006

☎ (+91) 8527635535
✉ arpita.sps@gmail.com



At Present

2018–till date **Assistant Professor.**

Department of Mathematics

J. C. Bose University of Science and Technology, YMCA

Education

2010 **Ph.D.**, *Indian Statistical Institute, Kolkata.*

Thesis title: “*Study of cavity quantum electrodynamics in boson Fock space and interacting Fock space*”

2003 **M.Sc. (77.7%)**, *Jadavpur University.*

2001 **B.Sc. (69.9%)**, *Burdwan University.*

1998 **Higher Secondary (73.3%)**, *West Bengal Council for Higher Secondary Education.*

1996 **Secondary (77%)**, *West Bengal Board for Secondary Education.*

Research Experience

2014-2017 **DST Fast Track Young Scientist**, *Jawaharlal Nehru University*, (**Research Grant - Rs. 25,32,000/-**).

2010-2013 **NBHM Post Doctoral Fellow**, *Jawaharlal Nehru University.*

2008-2009 **Senior Research Fellow**, *Indian Statistical Institute.*

2006-2008 **Junior Research Fellow**, *Indian Statistical Institute.*

2004-2005 **Project Assistant**, *Indian Statistical Institute.*

Teaching Experience

2009-2010 **Assistant Professor**, *Shri Shikshayatan College, University of Calcutta.*

2008-2009 **Lecturer**, *Scottish Church College, University of Calcutta.*

2008 **Mathematics Instructor, ISEC Regular Course**, *International Statistical Education Centre, Indian Statistical Institute.*

2004 **Guest Lecturer**, *Maharaja Manindra Chandra College, University of Calcutta.*

Awards & Fellowships

- 2023 **State University Research Excellence (SURE)** grant by **DST SERB**
(Ref. No. SUR/2022/000899), (**Research Grant - Rs.**)
- 2017 **National Post-Doctoral Fellowship (N-PDF)** by **DST SERB**
(Ref. No. PDF/2017/000403), (**Research Grant - Rs. 19,20,000/-**)
- 2014 **Fast Track Young Scientist** grant by **DST SERB**
(Ref. No. SB/FTP/PS-151/2013), (**Research Grant - Rs. 25,32,000/-**)
- 2014 **Dr. D. S. Kothari Post Doctoral Fellowship (DSKPDF)** by **UGC**
(Ref. No. PH/13-14/0035)
- 2009 **NBHM Post Doctoral Fellowship** by **DAE**
(Ref. No. 2/40(21)/2009-R& D-II/527)
- 2005 **CSIR JRF NET**
- 2004 **GATE**
- 2004 **CSIR Lectureship NET**

Research Publications

- 2023 “*Nonclassicality versus quantum non-Gaussianity of photon subtracted displaced Fock state*”
Deepak and **A. Chatterjee***
Accepted in **Can. J. Phys.**, (2023),
(**SCIE**, Impact factor-1.358)
- “*A comparative study of higher-order nonclassicalities of photon-added-then-subtracted and photon-subtracted-then-added quantum states*”
Deepak and **A. Chatterjee***
Accepted in **Ind. J. Phys.**, (2023),
(**SCIE**, Impact factor-1.778)
- “*Quantum phase properties of a state generated by a driven dispersive interaction*”
Naveen Kumar and **A. Chatterjee***
Revised version submitted to **Can. J. Phys.**, (2023),
(**SCIE**, Impact factor-1.358)
- “*Detecting nonclassicality and non-Gaussianity of a coherent superposed quantum state*”
Deepak and **A. Chatterjee***
J. Phys. B: At. Mol. Opt. Phys., 56(1), 015401 (2023),
<https://doi.org/10.1088/1361-6455/aca850>
(**SCIE**, Impact factor-1.917)

- 2022 “*Nonclassical properties of a deformed atom-cavity field state*”
Naveen Kumar, Deepak and **A. Chatterjee***
J. Mod. Opt., 69(18), 1052-1059 (2022),
<https://doi.org/10.1080/09500340.2022.2124462>
(SCIE, Impact factor-1.544)
- “*Realistic continuous-variable quantum teleportation using a displaced Fock state channel*”
Deepak and **A. Chatterjee***
Quant. Infor. Proc., 21, 145(1-14) (2022),
<https://doi.org/10.1007/s11128-022-03484-y>
(SCIE, Impact factor-2.349)
- “*Two-mode photon-added entangled coherent states and their entanglement properties*”
A. Chatterjee*
Acta Physica Polonica A, 141(3), 183-190 (2022),
<https://doi.org/10.12693/APhysPolA.141.183>
(SCIE, Impact factor-0.579)
- 2021 “*A comparison between higher-order nonclassicalities of superposition engineered coherent and thermal states*”
Deepak and **A. Chatterjee***
Can. J. Phys., 99(12), 1061-1072 (2021),
<https://doi.org/10.1139/cjp-2021-0098>
(SCIE, Impact factor-1.358)
- “*Lower- versus higher-order nonclassicalities for a coherent superposed quantum state*”
Deepak and **A. Chatterjee***
J. Opt. Soc. Am. B, 38(11), 3212-3221 (2021),
<https://doi.org/10.1364/JOSAB.424140>
(SCIE, Impact factor-2.180)
- “*Quantifying quantum correlation of quasi-Werner state and probing its suitability for quantum teleportation*”
A. Chatterjee, K. Thapliyal and A. Pathak
Annalen der Physik, 533(10), 2100201 (2021),
<https://doi.org/10.1002/andp.202100201>
(SCIE, Impact factor-3.317)
- “*Dynamics of an atom cavity field system in interacting Fock space*”
P. K. Das and **A. Chatterjee***
Int. J. Theo. Phys., 60(3), 954-967 (2021),
<https://doi.org/10.1007/s10773-021-04718-y>
(SCIE, Impact factor-1.708)

- 2019 “*Dynamics of a deformed atom cavity field system in presence of a Kerr-like medium*”
A. Chatterjee*
J. Mod. Opt., 66(6), 898-908 (2019),
<https://doi.org/10.1080/09500340.2019.1584337>
(SCIE, Impact factor-1.544)
- 2018 “*Entanglement potential versus negativity of Wigner function for SUP-operated quantum states*”
A. Chatterjee*
Int. J. Theo. Phys., 57(2), 339-352 (2018),
<https://doi.org/10.1007/s10773-017-3566-5>
(SCIE, Impact factor-1.708)
- 2016 “*Nonlinear displaced Kerr state and its nonclassical properties*”
A. Chatterjee and R. Ghosh
J. Opt. Soc. Am. B, 33(7), 1511-1522 (2016),
<https://doi.org/10.1364/JOSAB.33.001511>
(SCIE, Impact factor-2.180)
- “*The nonclassicality and decoherence of a superposition state generated in a resonant cavity*”
P. K. Das, P. Haldar and **A. Chatterjee***
Int. J. Theo. Phys., 55(11), 4951-4962 (2016),
<https://doi.org/10.1007/s10773-016-3119-3>
(SCIE, Impact factor-1.708)
- 2015 “*Generating continuous variable entangled states for quantum teleportation using a superposition of number-conserving operations*”
H. S. Dhar, **A. Chatterjee** and R. Ghosh
J. Phys. B: At. Mol. Opt. Phys., 48(18), 185502 (2015),
<https://doi.org/10.1088/0953-4075/48/18/185502>
(SCIE, Impact factor-2.115)
- 2014 “*Mapping generalized Jaynes-Cummings interaction into correlated finite-sized systems*”
H. S. Dhar, **A. Chatterjee** and R. Ghosh
J. Phys. B: At. Mol. Opt. Phys., 47(13), 135501 (2014),
<https://doi.org/10.1088/0953-4075/47/13/135501>
(SCIE, Impact factor-2.115)
- 2013 “*Controllable quantum correlations of two-photon states generated using classically driven three-level atoms*”
H. S. Dhar, S. Banerjee, **A. Chatterjee** and R. Ghosh
Annals of Phys., 331, 97-109 (2013),
<https://doi.org/10.1016/j.aop.2012.12.008>
(SCIE, Impact factor-2.267)

- 2012 “*Nonclassical properties of states engineered by superpositions of quantum operations on classical states*”
A. Chatterjee, H. S. Dhar and R. Ghosh
J. Phys. B: At. Mol. Opt. Phys., 45(20), 205501 (2012),
<https://doi.org/10.1088/0953-4075/45/20/205501>
(SCIE, Impact factor-2.115)
- “*Nonclassicality generated by propagation of atoms through a cavity field*”
A. Chatterjee*
Phys. Lett. A, 376(19), 1601-1607 (2012),
<https://doi.org/10.1016/j.physleta.2012.03.060>
(SCIE, Impact factor-2.278)
- “*Nonclassicality of photon-added-then-subtracted and photon-subtracted-then-added states*”
A. Chatterjee*
J. Mod. Opt., 59(9), 814-822 (2012),
<https://doi.org/10.1080/09500340.2012.670278>
(SCIE, Impact factor-1.544)
- 2011 “*Dynamics of a three-level atom interacting with a bimodal field in a resonant cavity*”
A. Ghosh*
Int. J. Mod. Phys. B, 25(8), 1091-1100 (2011),
<https://doi.org/10.1142/S0217979211100126>
(SCIE, Impact factor-1.219)
- 2009 “*Phase distribution of entangled state in interacting Fock space*”
P. K. Das and **A. Ghosh**
Int. J. Mod. Phys. B, 23(10), 2329-2337 (2009),
<https://doi.org/10.1142/S0217979209052273>
(SCIE, Impact factor-1.219)
- “*Direct measurement of phase and quasiprobability distributions of states in cavity QED*”
A. Ghosh and P. K. Das
Mod. Phys. Lett. B, 23(4), 575-581 (2009),
<https://doi.org/10.1142/S0217984909018060>
(SCIE, Impact factor-1.224)

- 2008 “*Generation of a superposition of coherent states in a resonant cavity and its nonclassicality and decoherence*”
A. Ghosh and P. K. Das
Can. J. Phys., 86(6), 811-818 (2008),
<https://doi.org/10.1139/P08-013>
(SCIE, Impact factor-1.358)
- “*Influence of cavity decay on phase distribution and Rabi flopping in cavity QED*”
A. Ghosh and P. K. Das
Int. J. Theo. Phys., 47(6), 1731-1741 (2008),
<https://doi.org/10.1007/s10773-007-9615-8>
(SCIE, Impact factor-1.708)
- 2007 “*Quasi-probability distributions of nonclassical states in interacting Fock space*”
P. K. Das and **A. Ghosh**
Banach Centre Publications, 78, 81-90 (2007),
<https://doi.org/10.4064/bc78-0-6>
- 2006 “*Phase changes in nonlinear processes in interacting Fock space*”
P. K. Das and **A. Ghosh**
Int. J. Mod. Phys. B, 20(4), 433-443 (2006),
<https://doi.org/10.1142/S0217979206033371>
(SCIE, Impact factor-1.219)

(* Corresponding Author)

Papers in Conference Proceedings

- 2022 “*Nonclassical properties of a state generated by a driven dispersive interaction*”
Naveen Kumar and **A. Chatterjee***
Accepted in **AIP Conference Proceedings**, (2022).
- “*Transforming different combinations of bosonic operators into normal and antinormal order*”
Deepak and **A. Chatterjee***
Submitted to **FIAM Conference Proceedings**, (2022).
- “*A comparison of higher- and lower-order nonclassicalities of photon-added Bell-type entangled coherent states*”
Deepak and **A. Chatterjee***
Published as a chapter in **ICMM Conference Proceedings** organized by CBLU, Bhiwani, (2021).

Sponsored Projects

- 2023 **SURE:** SUR/2022/000899 (Project approved)
Project Title: *“Analyzing the effect of photon subtraction on non-classicality and non-Gaussianity of displaced Fock state”*
Awarded by: DST SERB, New Delhi Grant: **Rs. /-**
Duration: 2023 to 2026 (3 years)
Host Institute: J. C. Bose University of Science and Technology, YMCA Faridabad
Status: Ongoing
- 2017 **N-PDF:** PDF/2017/000403 (Not availed)
Project Title: *“Higher order nonclassical properties of engineered quantum states”*
Awarded by: DST SERB, New Delhi Grant: **Rs. 19,20,000/-**
Duration: July 2018 to June 2020 (2 years)
Host Institute: Jaypee Institute of Information Technology, Noida
Status: Not availed
- 2014 **Fast Track Young Scientist:** SB/FTP/PS-151/2013 (Completed)
Project Title: *“Study of the applications of a coherent superposition of products of field annihilation and creation operators for quantum state engineering”*
Awarded by: DST SERB, New Delhi Grant: **Rs. 25,32,000/-**
Duration: October 2014 to September 2017 (3 years)
Host Institute: School of Physical Sciences, Jawaharlal Nehru University
Status: Completed

Memberships

- Life member of “The Indian Science Congress Association” (Membership no. L36321)
Life member of “The Indian Mathematical Society” (Membership no. L/2022/8)

Research Guidance

- Ph.D. Naveen Kumar (pursuing)
CSIR-SRF (Grant no. 09/1256 (0004)/2019-EMR-I)
Thesis Title: *“A study of non-classical properties of quantum states manufactured by an atom-field interaction”*
- Deepak (pursuing)
CSIR-SRF (Grant no. 09/1256 (0006)/2019-EMR-I)
Thesis Title: *“A theoretical study of non-classical features of different engineered quantum states”*
- Ankita (pursuing)

M.Sc.
projects

- 2022-2023
- Anoop Tewatia (21001753004)
 - Gunjan Yadav (21001753004)
 - Neha (21001753004)
 - Rashmi Pawar (21001753004)
 - Sonika Yadav (21001753004)
- 2021-2022
- Asha (20001753008)
 - Himani (20001753023)
 - Monika (20001753036)
 - Purna (20001753048)
 - Chetna Singh (20001753064)
- 2020-2021
- Asha (20201753008)
 - Himani (20201753023)
 - Monika (20201753036)
 - Purna (20201753048)
 - Chetna Singh (20201753064)
- 2019-2020
- Chanchal (19001753005)
 - Gunika Anand (19001753014)
 - Kavita (19001753021)
 - Kavita (19001753022)
 - Monika (19001753034)
 - Pooja (19001753040)
 - Tamanna (19001753060)
 - Vaishali (19001753061)
- 2018-2019
- Anjali (18001753004)
 - Deepak (18001753014)
 - Parul Pal (18001753036)
 - Payal Rao (18001753037)
 - Poonam (18001753038)
 - Sandhya Saini (18001753044)
 - Sonia (18001753050)
- 2017-2018
- Asha Sharma (17001753007)
 - Chetna Sharma (17001753010)
 - Deeksha Gambhir (17001753011)
 - Mansi Agarwal (17001753025)
 - Naveen Kumar (17001753032)
 - Pawan Kumar Mandal (17001753039)
 - Sandeep (17001753050)

Workshops and Conferences

- Invited Talk “*Non-classical Light and Its Manufacturing*”
CTP Seminar, Centre for Theoretical Physics, Jamia Millia Islamia (April 27, 2017)
- Oral Presentations “*Dynamics of a deformed atom cavity field system in presence of a Kerr-like medium*”
106th Indian Science Congress, LPU Jalandhar (January 03-07, 2019)
- “*Influence of cavity decay on Rabi Flopping and phase distribution in cavity QED*”
National Meet of Research Scholars in Mathematical Sciences, IIT Kanpur (October 30-November 03, 2007)
- Attended
- Second National Workshop on Techniques in Applied Mathematics, University of Calcutta (June 20-28, 2006)
 - Third National Workshop on Techniques in Applied Mathematics, University of Calcutta (October 10-18, 2006)
 - International Workshop on Complex Systems in Fluid Flows and Sedimentation Processes, Indian Statistical Institute, Kolkata (August 27-31, 2007)
 - International Conference on Recent Developments in Theoretical Physics, Indian Statistical Institute, Kolkata (December 04-07, 2007)
 - International Conference on Quantum Optics and Quantum Computing, Jaypee Institute, Noida (March 24-26, 2011)
 - 3rd International Conference on Current Developments in Atomic, Molecular, Optical and Nano Physics with applications, University of Delhi (December 14-16, 2011)

Other Activities

Expert Talk on “Basics of Biostatistics” at NIPER Guwahati

Coordinator

A Two Week Value added Course: “*An Introductory Course in Latex for Scientific Writing*”, JCBUST (February 15-27, 2021)

Reviewer in

- Chin. Opt. Lett.
- Int. J. Theo. Phys.
- Opt. Exp.
- J. Opt. Soc. Am. B
- J. Mod. Opt.
- Opt. Lett.