Curriculum Vitae



Personal details

Name: Narasimha Raju Chebrolu

Date of Birth: 01-08-1987

Place of birth: Rajahmundry

Nationality: Indian

Phone: (+91) 8106193506
Skype ID: narasimharaju04
E-mail: narasimharaju.phy@gmail.com
Scopus Author ID: 56156353700
ORCiD: https://orcid.org/0000-0002-2698-9625
LinkedIn: linkedin.com/in/narasimha-raju-chebrolu-48428915

Postdoctoral Research Experience

2023 March- Still: Assistant Professor, Department of Physics, Central University of Karnataka, Karnataka 585367, India

2020 September – Feb 2023: DST Inspire Faculty, Department of Physics, Central University of Karnataka, Karnataka.

2020 March – 2020 August: Postdoctoral student, IISER Pune, Pune.
Research Supervisor: **Prof. Bijay Kumar Agarwalla.**

2019 August – 2020 February: Research Assistant, University of Hyderabad, Hyderabad.
Research Supervisor: **Prof. Ashok Chatterjee.**

2018 August – 2019 August: Postdoctoral student, University of Seoul, Seoul, South Korea.
Research Supervisor: **Prof. Jeil Jung.**

2017 June – 2018 August: Postdoctoral student, National Kaohsiung Normal University, Taiwan.
Research Supervisor: **Prof. Sung Po Chao.**

2016 November– 2017 March: Visiting Scientist, Physics Department, University of Konstanz, Konstanz, Germany.
Research Supervisor: **Prof. Wolfgang Belzig.**

Education details

2009 – 2016: PhD in Condensed matter theory, School of Physics, University of Hyderabad, India.
Research Supervisor: **Prof. Ashok Chatterjee.**

2007 – 2009: M. Sc. (Physics) with 7.25 CGPA from University of Hyderabad, Hyderabad, Telangana, India.

2004 – 2007: B. Sc. (Mathematics, Physics & Chemistry) with 74 % from SKVT Degree College, Rajahmundry, Andhra Pradesh, India.

2002 – 2004: 10+2 (Mathematics, Physics & Chemistry) with 78 % from Government Junior College, Rajahmundry, Andhra Pradesh, India.

2001 – 2002: Secondary education (10^{th}) with 82.5 % from Government School for Boys, Rajahmundry, Andhra Pradesh, India.

Research guidance experience

Master Thesis Students at Department of Physics, Central University of Karnataka.

1. Aparna E T (2019MPH03) – Title: "Graphene Circular Magnetic Quantum Dot"
2. Prakash Dwivedi (2019MPH20) –Title: "Circular Magnetic Quantum Dot in an external magnetic field"
3. Rajesh Kumar Panda (2019MPH23) – Title: "Electrostatic Charge Distribution of Few-Layer Graphene"
4. Rajaram Meher (20PGPHY09) – "Effects of 2nd order electron-phonon interaction on transport properties of SMT device"
5. Mukundadev Behera (20PGPHY06) – "Flat Bands in Twisted Double Bilayer Graphene with Spin-Orbit Interaction"
6. Aditya Dashrath Poddar (22PGPHY05) – "Hydrogenic Impurity in a Quantum Dot with Gaussian Confinement".
7. Praveen Kamble (22PGPHY27) – "Effects of non-linear electron-phonon interaction on transport properties of SMT device at finite temperature".

Teaching experience

Department of Physics, Central University of Karnataka.

S. NO	Course Title	UG or PG Level	Time Period (Date from & upto)	Number of periods/week
1.	Mechanics (IS-CT-1.2)	UG	Nov 2020 – Marc 2021	4
2.	Mechanics Lab	UG	Nov 2020 – Marc 2021	8
3.	Computational Physics (PPHTS 10101)	PG	Nov 2020 – Marc 2021	3
4.	Nanoscience & technology (PPHTDS x004)	PG	May 2021 – July 2021	3
5.	Mechanics (IS-CT-1.2)	UG	Nov 2021 – Marc 2022	4

6.	Mechanics Lab	UG	Nov 2021 – Marc 2022	8
7.	Nanoscience & technology (PPHTDS x004)	PG	June 2022 – Sept 2022	3
8.	Computational Physics (PPHTS 10101)	PG	Nov 2022 – April 2023	3
9.	Solid State Physics (PPHTDS 1004)	PG	Sep 2022 – Feb 2023	3
10.	Waves and optics (UPMTC40017)	UG	Marc 2023-June 2023	4
11.	Waves and optics Lab (UPMPC40019)	UG	Marc 2023-June 2023	8

List of research publications

1. Binding energy between the magnetic impurity electron and the conduction electrons in the Anderson-Holstein model
   Ch. Narasimha Raju, Ashok Chatterjee, Eur. Phys. J. B **86**, 493 (2013).
   DOI: https://doi.org/10.1140/epjb/e2013-40276-y; ISSN: 1434-6036

2. Effect of external magnetic field on the bound state between the localized and conduction electrons in Anderson-Holstein model.
   Ch. Narasimha Raju, Ashok Chatterjee, Physica B: Condensed Matter **448**, 207 (2014).
   DOI: https://doi.org/10.1016/j.physb.2014.04.047; ISSN: 09214526

3. Effect of electron-phonon interaction and external magnetic field on the bound state in the Anderson-Holstein model: An improved variational calculation.
   Ch. Narasimha Raju, Ashok Chatterjee, Eur. Phys. J. B **88**, 108 (2015).
   DOI: https://doi.org/10.1140/epjb/e2015-50528-5; ISSN: 1434-6036

4. Ground state energy, binding energy and the impurity specific heat of Anderson-Holstein model.
   Ch. Narasimha Raju, Ashok Chatterjee, Can. J. Phys. **93**: 1024-1029 (2015).
   DOI: https://doi.org/10.1139/cjp-2014-0432 ; ISSN: 0008-4204

5. Specific heat of a localized magnetic impurity in a non-magnetic host: A Spectral density method for the Anderson-Holstein model. **Ch. Narasimha Raju**, Ashok Chatterjee, Physica B: Condensed Matter **474**, 37 (2015).
   DOI: https://doi.org/10.1016/j.physb.2015.05.038 ; ISSN: 09214526. Impact Factor: 3.2

6. Properties of a localized magnetic impurity in a superconducting host: The Anderson Holstein-BCS model. **Ch. Narasimha Raju***, Ashok Chatterjee, J. Magn. Magn. Mater. **396**, 71 (2015).
   DOI: https://doi.org/10.1016/j.jmmm.2015.07.110; ISSN: 1873-4766. Impact Factor: 3.0

7. Quantum dissipative effects on non-equilibrium transport through a single-molecular transistor: The Anderson-Holstein-Caldeira-Leggett model. **Ch. Narasimha Raju**, Ashok Chatterjee, Scientific Reports **6**, 18511 (2016).
   DOI: https://doi.org/10.1038/srep18511; ISSN: 2045-2322. Impact Factor: 4.9

8. Magnetic field effect on the energy levels of an exciton in a GaAs quantum dot: Application for excitonic lasers.
K. Luhluh Jahan, **Ch. Narasimha Raju**, Aalu Boda, I. V. Sankar, Ashok Chatterjee
Scientific Reports **8**, 5073 (2018).
DOI: https://doi.org/10.1038/s41598-018-23348-9; ISSN: 2045-2322. Impact Factor: 4.9

9. Flatbands in twisted double bilayer Graphene.
Ch. Narasimha Raju, Bheema Lingam Chittari, Jeil Jung, Phys. Rev. B **99**, 235417 (2019).
DOI: https://doi.org/10.1103/PhysRevB.99.235417; ISSN: 2469-9950

10. Magneto-transport properties of a single molecular transistor in the presence of electron-electron and electron-phonon interactions and quantum dissipation.
Manasa Kalla, **Ch. Narasimha Raju**, Ashok Chatterjee, Scientific Reports **9**, 16510 (2019).
DOI: https://doi.org/10.1038/s41598-019-53008-5; ISSN: 2045-2322. Impact Factor: 4.9

11. Quantum transport in a single molecular transistor at finite temperature.
Manasa Kalla, **Ch. Narasimha Raju**, Ashok Chatterjee, Scientific Reports **11**, 10458 (2021).
DOI: https://doi.org/10.1038/s41598-021-89436-5; ISSN: 2045-2322. Impact Factor: 4.9

12. Transient dynamics of a single molecular transistor in the presence of local electron-phonon and electron-electron interactions and quantum dissipation.
Manasa Kalla, **Ch. Narasimha Raju***, Ashok Chatterjee, Scientific Reports **12**, 9444 (2022).
DOI: https://doi.org/10.1038/s41598-022-13032-4; ISSN: 2045-2322. Impact Factor: 4.9

13. Analytical model of the energy spectrum and Landau levels of a twisted double bilayer graphene.
Ch. Narasimha Raju*, Bheema Lingam Chittari, Physica E: Low dimensional systems and Nanostructures **146**, 115526 (2023).
DOI: https://doi.org/10.1016/j.physe.2022.115526; ISSN: 1386-9477. Impact Factor: 2.5

14. Effect of spin–orbit interaction on flatbands and Landau levels in twisted double bilayer graphene.
Ch. Narasimha Raju*, Mukundadev Behera, Physica E: Low dimensional systems and Nanostructures **147**, 115602 (2023).
DOI: https://doi.org/10.1016/j.physe.2022.115602; ISSN: 1386-9477. Impact Factor: 2.5

15. Role of Rashba and Dresselhaus spin–orbit interactions on an off-center donor impurity in a Gaussian quantum dot. Anusha Kachu, **Ch. Narasimha Raju,** Aalu Boda, J. Magn. Magn. Mater. **589**, 171565 (2024).
DOI: https://doi.org/10.1016/j.jmmm.2023.171565; ISSN: 1386-9477. Impact Factor: 3.0

16. Spin-orbit interaction effects on electronic, magnetic, and optical properties of D0- center in a quantum dot with Gaussian confinement. Anusha Kachu, **Ch. Narasimha Raju,** Aalu Boda, Micro and Nanostructures **186**, 207733 (2024).
DOI: https://doi.org/10.1016/j.micrna.2023.207733; ISSN: 27730123. Impact Factor: 3.1

17. Role of confinement shape and spin-orbit interactions on binding energy, temperature, transition energy, susceptibility and oscillator strength of an off-center D0 impurity in a GaAs quantum dot.

Anusha Kachu, Swapna Vemula, **Narasimha Raju Chebrolu**, Aalu Boda, Physica B **693**, 416376 (2024).
DOI: https://doi.org/10.1016/j.physb.2024.416376; ISSN: 09214526. Impact Factor: 3.2

18. The impact of the external magnetic field on D^{+2} ion ground state properties in a Gaussian GaAs quantum dot. Siddartha Gone, Divya Rani Gunty, Madhusudan Gorre, Narasimha Raju Chebrolu, Aalu Boda, J. Magn. Magn. Mater. **629**, 173304 (2025).
DOI: http://dx.doi.org/10.1016/j.jmmm.2025.173304. ISSN: 1386-9477. Impact Factor: 3.0

19. Magnetic and binding properties of piezoelectric polarons in GaAs, CuCl, and RbCl quantum Wells. Swapna Vemula, Anusha Kachu, Thara Angoth, I. V. Sankar, Narasimha Raju Chebrolu, and Aalu Boda, Eur. Phys. J. B **98**, 146 (2025).
DOI: https://doi.org/10.1140/epjb/s10051-025-00986-3. ISSN: 1434-6036. Impact Factor: 1.9

20. Effects of linear and non-linear electron–phonon interactions on impurity bound states in BCS Superconductor. B Navashreya, Narasimha Raju Chebrolu*, Anusha Kachu, Aalu Boda, J. Magn. Magn. Mater. **630**, 173433 (2025).
DOI: https://doi.org/10.1016/j.jmmm.2025.173433. ISSN: 1386-9477. Impact Factor: 3.0

21. Tuning electronic and magnetic properties of off-center D− impurity in GaAs quantum dots with Spin–orbit interactions and magnetic field, Anusha Kachu, Aalu Boda, Narasimha Raju Chebrolu*, Results in Physics **8**, 108484 (2025).
DOI: https://doi.org/10.1016/j.rinp.2025.108484. ISSN: 2211-3797. Impact Factor: 4.6

22. Exploring the stability and spatial correlations of two-electron bound States in quantum Dots under spin orbit and magnetic influences, Anusha Kachu, Thara Angoth, Narasimha Raju Chebrolu & Aalu Boda, Scientific Reports **15**, 40219 (2025).
DOI: https://doi.org/10.1038/s41598-025-24038-z. ISSN: 2045-2322. Impact Factor: 4.9

23. Spin-Caloritronics in a Dissipative Single Molecular Junction: Role of Electron-Phonon Coupling, Magnetic Field, and Rashba Interaction, Anusha Kachu, Aalu Boda, I V Sankar, Narasimha Raju Chebrolu, Solid State Communications **416**, 116483 (2026).
DOI: https://doi.org/10.1016/j.ssc.2026.116483. ISSN: 1879-2766. Impact Factor: 2.8

24. Excited-state optical and magnetic properties of a polaron in an asymmetric Gaussian quantum well, Swapna Vemula, Anusha Kachu, Thara Angoth, I.V. Sankar, Narasimha Raju Chebrolu, Aalu Boda, Physics Letters A **592**, 131914 (2026).
DOI: https://doi.org/10.1016/j.physleta.2026.131914. ISSN: 0375-9601. Impact Factor: 2.7

25. The effects of Rashba spin-orbit and non-linear electron-phonon interactions on impurity induced bound states in BCS superconductors, B. Navashreya, Narasimha Raju Chebrolu, I. V. Sankar, Aalu Boda, Scientific Reports **16**, 22276 (2026).
DOI: https://doi.org/10.1038/s41598-026-51558-z. Impact Factor: 4.9

26. Negative differential resistance in single molecular transistor: The role of Coulomb interaction and non-linear electron-phonon coupling. B. Navashreya, Narasimha Raju Chebrolu, Aalu Boda, Soma Mukhopadhyay, Ashok Chatterjee, Physica E **185**, 116652 (2027).
DOI: https://doi.org/10.1016/j.physe.2026.116652. ISSN: 1386-9477. Impact Factor: 2.5

Research Grants:

Project Title: Effects of electron correlations and spin-orbit interaction on charge, spin and energy transport in graphene based nanoelectromechanical devices.
Grant amount: 35,00,000 INR,
Duration: 5 years.
Status: Completed.
Funding Agency: DST India.

Conference Oral Presentation

1. Spectral density method to Anderson-Holstein model.
   Ch. Narasimha Raju, Ashok Chatterjee, AIP Conference Proceedings **1665**, 090042 (2015).
2. Anderson-Holstein model: Some Applications
   November (2016), Physics Department, University of Konstanz, Konstanz, Germany.
3. Quantum transport in Molecular transistor: Anderson-Holstein-Caldeira-Leggett model
   August (2017), Physics Department, National Kaohsiung Normal University, Taiwan.
4. Annual Conference on Quantum Condensed Matter (QMAT 2023), NISER Bhubaneswar, India, 27^{th} -30^{th} November 2023.
5. International Workshop on Recent Advancements in Magnetism and Magnetic Materials 2024 (iReAd MAGMA24), November 26^{th} -30^{th}, 2024.

Conference Poster Presentations

1. Best research paper award – 2013, Frontiers in Physics (FIP), University of Hyderabad, Hyderabad.
2. Best research paper award – 2014, Frontiers in Physics (FIP), University of Hyderabad, Hyderabad.
3. India Singapore Joint Physics Symposium – 2015, IIT, Kanpur, India.
4. Magnetic Materials and Applications (MAGMA) – 2013, IIT, Guwahati, India.

References

1. **Prof. Ashok Chatterjee**
   School of Physics
   University of Hyderabad

2. Prof. Ch. Bheema Lingam
Department of Physical Sciences
IISER-Kolkata

Hyderabad 500046, India
E-mail: acsp.uohyd@gmail.com

Mohanpur 741246, West Bengal, India
E-mail: bheemalingam@iiserkol.ac.in

3. **Prof. S. Srinath**
School of Physics
University of Hyderabad
Hyderabad 500046, India
E-mail: srinaths10@gmail.com
Hyderabad 500046, India

4. **Prof. Sung Po Chao**
Department of Physics
National Kaohsiung Normal University,
Kaohsiung, Taiwan.
E-mail: spchao@gmail.com