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Designation : Associate Professor &
Head (UG Physics)

Department : Physics

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Educational Qualification:

DEGREE	SUBJECT	COLLEGE / UNIVERSITY & PLACE	YEAR COMPLETED
Ph. D.	Physics	Madurai Kamaraj University, Madurai	2008
M. Phil.	Physics	Department of Theoretical Physics, University of Madras, Chennai	1986
M. Sc.	Physics	Department of Theoretical Physics, University of Madras, Chennai	1985
PGDCA		Madurai Kamaraj University, Madurai	
B. Sc.	Physics	Government Arts College, Villupuram, University of Madras	1983

Specialization in Teaching:

- Theoretical Physics
- Quantum Physics
- Theoretical Condensed Matter Physics
- Particle Physics

Specialization in Research:

- Spin Transport and Spintronics related phenomena in Nanostructures

Research Interest:

- Theoretical Condensed Matter Physics
- Quantum Principles of Biological Systems
- Quantum Computers & Quantum Information Processing
- Adaptive Optics

List of Research Papers Published in International Journals:

1. **Spin polaron in a quantum dot of the diluted magnetic semiconductors**,
Gnanasekar K and Navaneethakrishnan K,
MODERN PHYSICS LETTERS B **18** (10), 419-426 (2004).
2. **Spin-polarized resonant tunneling in double-barrier structures**, Gnanasekar K and
Navaneethakrishnan K,
PHYSICA E-LOW-DIMENSIONAL SYSTEMS & NANOSTRUCTURES **28** (3), 328-
332 (2005).
3. **Spin-polarized electron transport through a non-magnetic double barrier
semiconductor heterostructure**,
Gnanasekar K and Navaneethakrishnan K,
PHYSICS LETTERS A **341** (5-6), 495-503 (2005).
4. **Binding energy of impurity states in a parabolic quantum dot in a strong magnetic
field**,
Peter AJ, Gnanasekar K and Navaneethakrishnan K,
PHYSICA STATUS SOLIDI B-BASIC SOLID STATE PHYSICS **242** (12), 2480-2488
(2005).
5. **Spin-polarized hole transport through a diluted magnetic semiconductor
heterostructure with magnetic field modulations**,
Gnanasekar K and Navaneethakrishnan K,
EUROPHYSICS LETTERS, **73** (5), 786-792 (2006).
6. **Effects of Rashba spin-orbit interaction on spin-dependent resonant tunneling in
ZnSe/Zn_{1-x}Mn_xSe multilayer heterostructures**,
Gnanasekar K and Navaneethakrishnan K,
PHYSICA E-LOW-DIMENSIONAL SYSTEMS & NANOSTRUCTURES, **35**, 103-109
(2006).

7. **Combined effects of electric and magnetic fields on confined donor states in a diluted magnetic semiconductor parabolic quantum dot**,
Peter AJ, Gnanasekar K and Navaneethakrishnan K,
EUROPEAN PHYSICAL JOURNAL B, **53**, 283-288 (2006).
8. **Spin-polarized transport through a time-periodic non-magnetic semiconductor heterostructure**,
Gnanasekar K and Navaneethakrishnan K,
EUROPEAN PHYSICAL JOURNAL B, **53**, 455-461 (2006).
9. **Electrically Tunable ‘Renormalization’ of s-d Exchange Interaction in a Diluted Magnetic Semiconductor Quantum Dot**,
Gnanasekar K and Navaneethakrishnan K,
INTERNATIONAL JOURNAL OF NANOSCIENCE, **6**, 71-76 (2007).
10. **Synthesis and structural, magnetic characterization of Zn(Mn)O diluted magnetic semiconductor**
Aruna Ramachandran, P. Kalaivanan, and K. Gnanasekar
Superlattices and Microstructures **52** (2012) 1020–1025
11. **Effect of negative electric field on spin-dependent tunneling in double barrier semiconductor heterostructures**
L. Bruno Chandrasekar, K. Gnanasekar, M. Karunakaran, and R. Chandramohan
Current Applied Physics **15**, 1421-1427 (2015)
ISSN: 1567-1739 Imp. Fac.: 2.058 <https://doi.org/10.1016/j.cap.2015.08.005>
12. **Effect of ‘Al’ concentration on spin-dependent resonant tunnelling in InAs/Ga_{1-y}Al_yAs symmetrical double-barrier heterostructures**
L. Bruno Chandrasekar, K. Gnanasekar, M. Karunakaran, and R. Chandramohan **Bull. Mater. Sci.**, **39**, 1435–1440 (2016)
ISSN: 0250-4707 Imp. Fac. 0.925 <https://doi.org/10.1007/s12034-016-1299-3>
13. **Effect of barrier width on Spin dependent tunneling in Asymmetrical double barrier semiconductor heterostructures**
L. Bruno Chandrasekar, K. Gnanasekar, M. Karunakaran, and R. Chandramohan
Journal of Nanoengineering and Nanomanufacturing **6** (3), 175-179 (2016)
ISSN:2157-9326 <https://doi.org/10.1166/jnan.2016.1290>
14. **Effect of magnetic field on spin-dependent hole transport through a type-I Cd_{1-x}Mn_xTe / CdTe double barrier heterostructure**
L. Bruno Chandrasekar, K. Gnanasekar, M. Karunakaran, and R. Chandramohan **Eur. Phys. J. Plus**, **132** (6), 279(2017)
ISSN: 2190-5444 Imp. Fac.: 2.240 <https://doi.org/10.1140/epjp/i2017-11542-5>

15. **Quantum Approach to Economic Phenomena**, K. Gnanasekar,
ROOTS International Journal of Multidisciplinary Researches (UGC Approved
Journal J. No. 48991), Vol. 4, Spl. Issue 1, December, 2017, ISSN: 2349-8684.
16. **Effect of the δ -potential on spin-dependent electron tunneling in double barrier semiconductor heterostructure**
LB Chandrasekar, K Gnanasekar, M Karunakaran - Superlattices and
Microstructures, **118**, 319-323 (2018) ISSN: 0749-6036 Imp. Fac.: 2.099
<https://doi.org/10.1016/j.spmi.2018.03.069>
17. **Spin-dependent tunneling of light and heavy holes with electric and magnetic fields**
LB Chandrasekar, M Karunakaran, K Gnanasekar - **Journal of Semiconductors**, **39**(11),
112001, 2018 <https://doi.org/10.1088/1674-4926/39/11/112001>
18. **Spin-resonant tunneling in CdTe/Cd_{1-x}Mn_xTe double-barrier heterostructures with zero external field**
R. Dilber Pushpitha, L. Bruno Chandrasekar, J. Thirumali, K. Gnanasekar, R.
Chandramohan - **Physica E: Low-dimensional Systems and Nanostructures**, **107**, 187-
195, 2019
<https://doi.org/10.1016/j.physe.2018.11.017>
19. **Spin-Dependent Electron Tunneling in ZnSe/Zn_{1-x}Mn_xSe Heterostructures with Double δ -Potentials**
L. Bruno Chandrasekar, M Karunakaran, K Gnanasekar - **Commun. Theor. Phys.**, **71**
(3), 339–343, 2019
<https://doi.org/10.1088/0253-6102/71/3/339>
20. **Effect of pressure and temperature on spin-dependent tunneling in InAs/GaAs heterostructure with Dresselhaus spin-orbit interaction**
L. Bruno Chandrasekar, M Karunakaran, K Gnanasekar – **Physics Letters A**, **383** (34),
125989, 2019
<https://doi.org/10.1016/j.physleta.2019.125989>
21. **Spintronics – A mini review** L. Bruno Chandrasekar, K Gnanasekar, M Karunakaran -
Superlattices and Microstructures, 136(2019) 106322
<https://doi.org/10.1016/j.spmi.2019.106322>

List of Research Papers presented in Conferences / Symposia / Workshops:

1. **Spin polarized transport of holes in diluted magnetic semiconductor multi-layer hetero-structures**,
SOLID STATE PHYSICS (DAE – Symposium, India) **50**, 823-824 (2005).
(Proceedings of the **DAE Solid State Physics Symposium** sponsored by Board of
Research in Nuclear Sciences and Department of Atomic Energy, Government of India
and conducted at Bhabha Atomic Research Centre, Mumbai during December 5-9, 2005).

- 2. Spin-polarized electron transport through non-magnetic semiconductor heterostructures,**
(Presented in **Science and Engineering Research Council (SERC) - School on Condensed Matter Physics**, sponsored by Department of Science and Technology, Government of India held at Saha Institute of Nuclear Physics, Kolkata from 2nd to 31st, January 2006).

- 3. Spin dependent resonant tunneling in ZnSe / Zn_{1-x}Mn_xSe heterostructures with Rashba spin-orbit interaction,**
(Presented in the **International Workshop on the Physics of Zero and One Dimensional Nanoscopic Systems**, held at Saha Institute of Nuclear Physics, Kolkata during February 1-9, 2006).