Manosh T. M.

Manosh Tharayilparambil Manoharan
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Current Position

- **Ph.D. Student**
  CSIR SRF, Department of Physics, Cochin University of Science and Technology, (2019 – Present).
  Supervisor: **Dr Titus K Mathew**, Professor, CUSAT.

  I work on holographic dark energy model and horizon thermodynamics. I also focus of the effects of neutrinos in the cosmic evolution and explore the features like geometric phases in neutrino oscillation. I am also active member of Fermilab, NOvA collaboration.

Research & Employment

- **Project Intern** at the Department of Physics, Panjab University, in Experimental Neutrino Physics. Mentor: **Dr Vipin Bhatnagar**, Professor (November, 2019.)

  Intern-ship focused on accruing skill sets for experimental high energy physics research.

- **KSCSTE Project Fellow** at the Department of Physics, Cochin University of Science and Technology, in Theoretical Quantum Optics. Mentor: **Dr Ramesh Babu T.**, Emeritus Scientist (2017 – 2019.)

  In this project we focused on analytic and numerical simulations of coupled cavity systems with qubits for quantum information processing, quantum state preservation and entanglement generation with non linear optical processes.

Education

- **M.Sc.Physics**, Maharajas College, Ernakulam, Mahatma Gandhi University, Kottayam, India. (June, 2016), 85.5%.
- **B.Sc.Physics**, Maharajas College, Ernakulam, Mahatma Gandhi University, Kottayam, India. (June, 2014), 93.2%.
- **Senior Secondary**, G. G. H. S. S. Thripunithura, Kerala Board, India. (June 2011).
- **Secondary School**, St. Rita's H. S., Ponnurunni, Kerala Board, India. (June 2009).

Awards & Scholarships

- **CSIR – JRF and NET** Government of India (2017).
- **KSCSTE, Emeritus Scientist Scheme project fellowship**, Government of Kerala (2017 – 2019).
- **Communicative English Trainer, ASAP** Kerala Government, British Council Aptis Test, CEFR level C.
- **Dr.Annie Joseph Vallamattom Memorial** Inter Collegiate Project Presentation, Winner (M.Sc Physics) for best project.

- **Maharaja's College OSA**, Outstanding performance in B.Sc. Physics.
- **Fanny Pallan Memorial Award** winner for 3 years in B.Sc. Physics
- **Hindi Merit Scholarship**, Government of Kerala (Since 2011 – 2013).
- **Student delegate** at the program "Igniting the aspirations", chaired by the former Indian President, Dr. A. P. J Abdul Kalam, conducted by Swadeshi Science movement.

Publications / Thesis

Articles/preprints

8. **Manosh T. Manoharan**, N. Shaji and Titus k. Mathew, Holographic dark energy from the laws of thermodynamics with Rényi entropy, arXiv:**2208.08736** [gr-qc] (**2022**). **Accepted in The European Physical Journal C (2023)**
7. **Manosh T. M.**, N. Shaji, Ramesh Babu Thayyullathil and Titus K. Mathew, **Geometric phases in neutrino mixing** , arXiv:**2212.08245** [hep-ph] (**2022**). **Accepted in Modern Physics Letter A**
6. M. A. Acero et al., (NOvA Collaboration), The Profiled Feldman-Cousins technique for confidence interval construction in the presence of nuisance parameters, arXiv:**2207.14353** [hep-ex] (**2022**).
5. M. A. Acero et al., (NOvA Collaboration), Measurement of the ν_e–Nucleus Charged-Current Double-Differential Cross Section at $< E_\nu >= 2.4$ GeV using NOvA, arXiv:**2206.10585** [hep-ex] (**2022**). **Accepted in Physical Review Letters**
4. Muhammed Ashefas C.H., **T. M. Manosh** and Ramesh Babu Thayyullathil, **Kerr-Nonlinearity Enhanced Single Photon Blockade in Jaynes-Cummings Model**, International Journal of Theoretical Physics, Vol. **61**, **186** (**2022**)
3. **Manosh T. M.**, N. Shaji, Ramesh Babu Thayyullathil and Titus K. Mathew, **Pancharatnam-Berry phase in neutrino mixing** , arXiv:**2104.12632** [hep-ph] (**2021**).
2. Muhammed Ashefas C.H., **T. M. Manosh** and Ramesh Babu Thayyullathil, **Preservation of dynamics in coupled cavity system using second order nonlinearity**, arXiv:**1903.11912** [quant-ph] (**2019**).
1. **T. M. Manosh**, Muhammed Ashefas and Ramesh Babu Thayyullathil, **Effects of Kerr medium in coupled cavities on quantum state transfer**, Journal of Nonlinear Optical Physics & Materials Vol. **27**, No. **03**, **1850035** (**2018**).

Posters/Talks

5. 32nd meeting of Indian Association for General Relativity and Gravitation (IAGRG32), IISER Kolkata, December 2022.
   Title: **Rényi holographic dark energy from the laws of horizon thermodynamics** (Talk)
4. XXV DAE-BRNS High Energy Physics Symposium 2022, IISER Mohali, December 2022.
   Title: **Off-diagonal geometric phases in neutrino mixing** (Poster)
3. International e-Conference on Recent Advances in Physical Science (ICRAPS)", UGC- STRIDE Mahatma Gandhi University, in association with Bharata Matha College, India, in December 2021.
   Title: **Diagonal and off-diagonal geometric phases in neutrino oscillation** (Talk)
   Selected as best presentation.
2. Quantum Information Days Workshop, CTP Polish Academy of Sciences, Poland, in February 2021.
   Title: **Simulating Hamiltonians in Quantum Circuits** (Poster)

1. ROWS 2020, Virtual International Conference, Kerala University, December 2020.
   Title: **Berry phase in cavity system** (Talk)

M.Sc. Project

Loop Quantum Gravity, an Introduction, 2016, Supervisor **Dr N. Shaji,** Canonical quantization procedure on gravity based on Loop Quantum states.

B.Sc. Project

A Study on Comet ISON's Orbit, 2014, supervisor **Dr N. Shaji**, Astronomical data analysis on the trajectory of comet ISON.

Technical Skills

- OS : Fedora, Ubuntu and Windows
- Computation : Python (numpy, matplotlib, QuTiP etc.), Mathematica, C++.
- Other Software : LaTeX, Ink Scape, Krita.

Seminars / Conferences / Outreach

- Speaker at "Annular Solar Eclipse Observation at CUSAT", Aluva, December 26, 2019.
- Workshop on Neutrino Physics: Theory and Experiment,Banaras Hindu University, Varansi, 2019.
- International Workshop on Frontiers in High Energy Physics, FHEP, University of Hyderabad, 2019.
- Speaker at Aquinas College, on History and Physics of Space mission, 2019.
- Speaker at CUSAT, Workshop on Scientific Awareness, by IUCAA, IUCKLAM and KSSP 2019.
- Regional Astronomers Meet, CUSAT, IUCAA, 2019.
- Speaker at "National Seminar on Theoretical Physics", St. Paul's College Aluva, 2018
- Speaker at Super – Blood – Blue moon watch, CUSAT, Aluva, 2018.
- Two day national symposium on "Frontier in physics", St. Teresa's College, 2017
- Two day national seminar on "100 years of LASER", Maharajas College, 2017
- Workshop on "Statistical analysis in Cosmology", IUCAA, CUSAT, 2017
- Two day seminar on "Foundations on Theoretical Physics", Maharajas College Ernakulam,2016
- Workshop on "Solar Astrophysics", IUCAA, MA College Kothamangalam,2016
- Seminar on "Gravitational waves and Black hole entropy", Aquinas College, Edacochin, July 2016
- ASAP Government of Kerala, CET program, UC College Aluva, 2016
- Advanced Workshop on Time Domain Astronomy and Cosmology, IRC, IUCAA St. Thomas College Kozhencherry at CMS Kottayam, 2015
- School on Gravitation and Cosmology, IRC Department of Physics CUSAT, 2015
- National Seminar on "GTR and Quantum Theory", Maharaja's College, 2015
- National Seminar on "Science and Society in Medieval Kerala", Maharaja's College, 2013

References

Dr Titus K Mathew
Professor
Department of Physics
CUSAT, India

Dr Ramesh Babu T.
Adjunct Faculty
Department of Physics
CUSAT, India

Dr N. Shaji
Adjunct Faculty
Department of Physics
CUSAT, India

Personal Profile

I also go by Manu, which is an Indian diminutive of Manosh. My pronouns are he/his/him.
Born on October 25, 1993
Visual – Artist with an aptitude towards pencil-sketches and charcoal.
Fluent in English, Hindi and Malayalam
Resides in Kochi, Kerala.
Tharayilparambil House, Manu Nivas, LPS Road Palarivattom, Kerala, Kochi-682025, India.