Curriculum Vitae

Rahul Muraleedharan

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Education

- **PhD Physics** 2023 onwards
  University of Oklahoma,OK,U.S.A
- **M.Sc. Physics** 2018–2020
  Indian Institute of Technology(IIT)–Ropar,PB,India
- **B.Sc. Physics** 2014–2017
  University of Calicut,KL,India

Fellowships and Awards

- Dr.George Randolph Kalbfleisch Scholarship,*University of Oklahoma* 2026
- Graduate Teaching Assistant,*University of Oklahoma* 2023 onwards

Research interests

Formal and phenomenological aspects of particle physics, with current focus on quantum information science in particle physics.

Publications

An up-to-date list of publications can be found at [INSPIRE profile]. In the theoretical high energy community, the author list is usually **alphabetical**.

1. Kun-Feng Lyu, Rahul Muraleedharan, Kuver Sinha, "Entanglement, Yang-Mills, and the Scattering Matrix as an SU(N)-equivariant Kernel", *JHEP* **06**, (2026) (210).

Conferences and Workshops

6. Selected Participant – *Multimessenger Probes of New Scales in Physics,* Aspen Winter Conference, Jan 2027.
5. *Particle Physics on the Plains 2026*, University of Kansas, Nov 2026.
4. *Quantum Technologies for Fundamental Physics:Global Networks*, University of Kansas, May 2026.
3. 33^{rd} *International Conference on Supersymmetry and Fundamental Interactions*, University of Oklahoma, May 2026.
2. *Phenomenology 2026 Symposium*, University of Pittsburgh, May 2026.
1. *Particle Physics on the Plains 2025*, University of Kansas, Nov 2025.

Research Presentations

2. ***Entanglement, Yang-Mills, and the Scattering Matrix as an SU(N)-equivariant Kernel***, parallel talk at *Phenomenology 2026 Symposium*, University of Pittsburgh, May 2026.
1. ***Entanglement in Color Space***, plenary talk at *Particle Physics on the Plains 2025*, University of Kansas, Nov 2025.

Teaching

- PHYS5583:Electrodynamics II(Teaching assistant, Fall-2026). Topics–Graduate level Electrodynamics.
- PHYS2424:General Physics(Co-Instructor, Summer-2026). Topics–Electrodynamics and Thermodynamics(calculus based course).
- PHYS5573:Electrodynamics I(Teaching assistant, Spring-2026). Topics–Graduate level Electrodynamics.
- PHYS5583:Electrodynamics II(Teaching assistant, Fall-2025). Topics–Graduate level Electrodynamics.
- PHYS2424:General Physics(Co-Instructor, Summer-2025). Topics–Electrodynamics and Thermodynamics(calculus based course).
- PHYS5573:Electrodynamics I(Teaching assistant, Spring-2025). Topics–Graduate level Electrodynamics.
- PHYS4153:Classical Mechanics(Teaching assistant, Fall-2024). Topics–Undergraduate level Thermodynamics and Statistical Mechanics
- PHYS3053:Classical Mechanics(Teaching assistant, Fall-2024). Topics–Undergraduate level calculus based course on Classical Mechanics.

- PHYS2414:General Physics (Teaching assistant, Spring-2024). Topics–Mechanics (algebra-based course).
- PHYS2424:General Physics (Teaching assistant, Fall-2023). Topics–Electromagnetic theory (algebra-based course).

Professional Teaching Experience

Prior to joining the University of Oklahoma, my teaching consisted of the following:

- Physics Instructor, *Direction group of institution private limited,Kerala.* 2020–2023
  - Prepared and delivered undergraduate level lectures on Electrodynamics and Mathematical methods to 30+ students preparing for *Joint Admission test for Masters* conducted by *Indian Institute of Technology*, (IIT JAM).
  - Primary references: *Introduction to Electrodynamics* by David J. Griffiths and *Mathematical methods in the Physical Sciences* by Mary L. Boas.

Academic Service and Outreach

- *University of Oklahoma*: Serving as a member of *Graduate Physics Student Interdependence(GPSI)*(February 2026 onwards).
- *Indian Institute of Technology–Ropar*: Coordinator of *Zenith- the astronomy club of IIT Ropar*(2019-2020). As coordinator, mentored students, organized sky-watching sessions and astronomy outreach activities and co-founded the institute's astronomy magazine– *Astromag*. Collaborated with IIT Ropar run NGO- *Pehchaan Ek Safar* to develop an outreach program to introduce observational astronomy to local students.
- *Zamorins Guruvayurappan College*: Elected as the Association Secretary of the Physics Department of the college (2016–2017).