Curriculum Vitae

Dr. MANU KURIAN

Assistant Professor
Department of Physics,
Indian Institute of Technology Dhanbad
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Education:

- *2016-2020*: Ph.D. in theoretical high-energy physics from Indian Institute of Technology Gandhinagar, India (supervisor: Prof. Vinod Chandra).
- *2013 -2015*: Masters degree in Physics (M.Sc.), from Department of physics, Calicut University, Kerala, India.
- *2010 - 2013*: Bachelor degree in Physics (B.Sc.), from Calicut University, Kerala, India.
- *2008 - 2010*: Higher Secondary Education from St. Josephs school Kodenchery, Kerala, India.
- *2008*: Secondary School, St. Josephs school Kodenchery, Kerala, India.

Experience:

- 12/2024-*present*: Assistant Professor, Department of Physics, Indian Institute of Technology Dhanbad.
- 05/*2023-11/2024*: Special RIKEN Postdoctoral (SPDR) Fellow at Brookhaven National Laboratory (BNL) (RIKEN Research Center), New York, US.
- *01/2022-04/2023*: Postdoctoral researcher with James McGill distinguished Professor Charles Gale at McGill University, Quebec, Canada.
- 11/*2020-01/2022*: Institute postdoctoral fellow at Indian Institute of Technology (IIT), Gandhinagar.
- *07/2019-11/2019*: Graduate Research Trainee (GRT) at McGill University, Canada.

Professional Activities:

- Reviewer of Journal: Physical Review D (PRD), 2021-present
- Reviewer of Journal: Physical Review C (PRC), 2022-present
- Reviewer of Journal: Nuclear Physics B, 2021-present
- Reviewer of Journal: International Journal of Modern Physics E (IJMPE), 2023-present
- Convenor of RIKEN Brookhaven National Laboratory (BNL) seminar series, July 2023-2024.

- Organizer of the Seminar Series on Hadronic Physics at McGill University, 2022-2023.

Research Interests:

I am interested in various aspects of high-energy physics. My areas of expertise are:

- Perturbative and non-perturbative QCD
- Heavy flavor Physics-Theory and Phenomenology
- Hadronic physics
- Hydrodynamical modelling of expanding medium and magnetohydrodynamics
- Physics of Quark Gluon Plasma (Chiral QGP medium, transport properties)
- Electromagnetic probes of heavy Ion collision

Awards, Prizes & Grants:

- *Special Postdoctoral Fellowship* (SPRD) to work at RIKEN Research Center Brookhaven National Laboratory (BNL), Long Island, New York, US, 2023.

- Quebec Merit Fellowship: Postdoctoral fellowship under *Excellence Scholarship Program for Foreign Students* (PBEEE) from the Fonds de Recherche du Quebec - Nature et Technologies (FRQNT), 2021-2022

- *Gold Medal for Outstanding Research* in Ph.D., Indian Institute of Technology Gandhinagar, August 2021.

- *Overseas research experience fellowship* from Indian Institute of Technology, Gandhinagar to visit McGill University, Canada, 2019.

- *Graduate Teaching Fellowship* in the course Quantum Mechanics-II, January-April 2019.

- Qualified Joint CSIR-UGC (Council of Scientific and Industrial Research-University Grants Commission) test for *Junior Research Fellowship* (JRF), All India raking-138, June 2017.

- Qualified *National Eligibility Test*-NET (for lectureship) in India, 2017.

- All India ranking 28 for Graduate Aptitude Test in Engineering (GATE)-Physics subject, 2016.

- Recipient of *Higher Education Scholarship* from Kerala State Higher Education Council, 2011-2015.

Publications in Peer Reviewed Journals:

-- *Published articles in Journals*

(1). *Revisiting shear stress tensor evolution: Non-resistive magnetohydrodynamics with momentum-dependent relaxation time*;
Sunny Kumar Singh, **Manu Kurian,** Vinod Chandra;
(accepted in Physical Review D; in production).

(2). *Energy loss of a fast moving parton in Gribov-Zwanziger plasma*; Manas Debnath, Ritesh Ghosh,

Mohammad Yousuf Jamal, **Manu Kurian,** Jai Prakash;
Physical Review D Letters 109, L011503 (2024)

(3). *Impact of chiral asymmetry and magnetic field on passage of an energetic test parton in a QCD medium*;
Ritesh Ghosh, Mohammad Yousuf Jamal, **Manu Kurian**;
Physical Review D 108, 054035 (2023).

(4). *Open charm phenomenology with a multi-stage approach to relativistic heavy-ion collisions*;
Mayank Singh, **Manu Kurian**, Sangyong Jeon, and Charles Gale;
Physical Review C 108, 054901 (2023).

(5). *Magnetic field dependent electric charge transport in hadronic medium at finite temperature*;
Ritesh Ghosh, **Manu Kurian**;
Physical Review C 107, 034903 (2023).

(6). *Thermal and thermoelectric responses of hot QCD medium in time-varying magnetic fields*;
Gowthama K. K., **Manu Kurian**, Vinod Chandra;
Physical Review D 106, 034008 (2022).

(7). *Dragging heavy quark in anisotropic QCD medium beyond the static limit*;
Avdhesh Kumar, **Manu Kurian**, Santosh K. Das, Vinod Chandra;
Physical Review C 105, 054903 (2022).

(8). *Thermal dilepton production in collisional hot QCD medium in the presence of chromo-turbulent fields*;
Vinod Chandra, **Manu Kurian**, Lakshmi J. Naik and V. Sreekanth;
Journal of Physics: G 49 (2022) 7, 075103.

(9). *Thermoelectric behaviour of hot collisional and magnetized QCD medium from an effective kinetic theory*;
Manu Kurian;
Physical Review D 103, 054024 (2021).

(10). *Electromagnetic response of hot QCD medium in the presence of background time-varying fields*;
Gowthama K. K., **Manu Kurian**, Vinod Chandra;
Physical Review D 104, 094037 (2021).

(11). *Heavy quark transport coefficients in a viscous QCD medium with collisional and radiative processes*;
Adiba Shaikh, **Manu Kurian**, Santosh K. Das, Vinod Chandra, Sadhana Dash, B. K. Nandi;
Physical Review D 104, 034017 (2021).

(12). *Heavy quark transport in an anisotropic hot QCD medium: collisional and radiative processes*;
Jai Prakash, **Manu Kurian**, Santhosh K. Das and Vinod Chandra;
Physical Review D 103, 094009 (2021).

(13). *Response of a weakly magnetized QCD medium to inhomogeneous electric field*;
Gowthama K. K., **Manu Kurian**, Vinod Chandra;
Physical Review D 103, 074017 (2021).

(14). *Second order relativistic viscous hydrodynamics within an effective description of hot QCD medium*;
Samapan Bhadury, **Manu Kurian**, Vinod Chandra, Amaresh Jaiswal;
Journal of Physics G: Nuclear and Particle Physics 48 (2021), 105104.

(15). *Dynamics of QCD Matter—current status*;
A. Jaiswal, **M.Kurian** et.al, ;
International Journal of Modern Physics E 24 (2021) 2130001.

(16). *Thermal transport in a weakly magnetized hot QCD medium*;
Manu Kurian;
Physical Review D 102, 014041(2020).

(17). *Charm quark dynamics in quark-gluon plasma with 3+1 D viscous hydrodynamics*;
Manu Kurian, Mayank Singh, Vinod Chandra, Sangyong Jeon, and Charles Gale;
Physical Review C 102, 044907 (2020).

(18). *First order dissipative hydrodynamics and viscous corrections to the entropy four-current from an effective covariant kinetic theory*;
Samapan Bhadury, **Manu Kurian**, Vinod Chandra, Amaresh Jaiswal;
Journal of Physics G: Nuclear and Particle Physics 47, 085108 (2020).

(19). *Impact of longitudinal bulk viscous effects to heavy quark transport in a strongly magnetized hot QCD medium*;
Manu Kurian, Santhosh K. Das, Vinod Chandra;
Physical Review D 101, 094024 (2020).

(20). *Heavy quark dynamics in a hot magnetized QCD medium*;
Manu Kurian, Santhosh K. Das, Vinod Chandra;
Physical Review D 100, 074003 (2019).

(21). *Longitudinal conductivity of hot magnetized collisional QCD medium in the inhomogeneous electric field*;
Manu Kurian, Vinod Chandra;
Physical Review D 99, 116018 (2019).

(22). *Transport coefficients of hot magnetized QCD matter beyond the lowest Landau level approximation*;
Manu Kurian, Sukanya Mitra, S. Ghosh, Vinod Chandra;
European Physical Journal C 97, 134 (2019).

(23). *Bulk viscosity of a hot QCD medium in a strong magnetic field within the relaxation-time approximation*;
Manu Kurian, Vinod Chandra;
Physical Review D 97, 116008 (2018).

(24). *Effective description of hot QCD medium in strong magnetic field and longitudinal conductivity*;
Manu Kurian, Vinod Chandra;
Physical Review D 96, 114026 (2017).

-- *Proceedings and conference papers (with peer review)*

(27) *Thermal and Electric Charge Transport in a Weakly Magnetized Hot QCD Medium*
Manu Kurian;
Proceedings of DAE-BRNS High Energy Physics Symposium,
Springer Proc.Phys. 277 (2022) 391-395.

(28) *Dynamics of QCD Matter—current status and Developments*;
Santosh K. Das, **M. Kurian**, et.al, ;
arXiv:2211.06729 (2022), International Journal of Modern Physics E 31 (2022) 12

(29) *Electric charge transport in QCD medium in the presence of time-varying electromagnetic fields*;
Gowthama K. K., **Manu Kurian**, Vinod Chandra;
DAE Symp. Nucl. Phys. 65, 742-743 (2022).

(30) *Charm quark transport within viscous QCD medium: Colliding and radiating*;
Adiba Shaikh, **Manu Kurian**, Santosh K. Das, Vinod Chandra, Sadhana Dash, B. K. Nandi;
PoS CHARM2020 (2021) 060.

(31). *Transport phenomena in the hot magnetized quark-gluon plasma*;
Manu Kurian, Vinod Chandra;
Proceedings of XXIII DAE High Energy Physics Symposium,
Springer Proc.Phys. 261 (2021) 1013-1017.

(32). *Relativistic Dissipative Hydrodynamics: Quasiparticle Description*;
Samapan Bhadury, **Manu Kurian**, Vinod Chandra, A. Jaiswal;
International Conference on Strangeness in Quark Matter (SQM 2019),
Springer Proceedings in Physics, vol 250. Springer, Cham.
https://link.springer.com/chapter/10.1007/978-3-030-53448-6_69

(33). *First order dissipative hydrodynamics from an effective fugacity model*;
Samapan Bhadury, **Manu Kurian**, Vinod Chandra, A. Jaiswal;
DAE Symp. Nucl. Phys. 64, 810-811 (2020).

(34). *Hot nuclear matter in strong magnetic field*;
Manu Kurian, Vinod Chandra;
DAE Symp.Nucl.Phys. 62, 918-919 (2017).

Posters/Talks/Conferences/Presentations:

- **Talk:** Speaker at 21st International Conference on Strangeness in Quark Matter, Strasbourg, France, June 04, 2024.
- **Talk:** Plenary speaker at 4th Heavy Flavor Meet, Indian Institute of Technology Goa, November 02, 2023.
- **Talk:** Invited speaker at Center of Nuclear Theory seminar series at Stony Brook University, US, July 26, 2023.
- **Talk:** Invited speaker for RBRC seminar, RIKEN/Brookhaven National Laboratory (BNL), New York, US, June 01, 2023.

- **Talk:** 9th edition of the Workshop for Young Scientists on the Physics of Ultra-relativistic Nucleus-Nucleus Collisions (Hot Quarks 2022), Colorado, US, October 14, 2022.

- **Poster presentation**: Quark Matter 2022 is the XXIXth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions, Krakow, Poland, April, 2022.

- **Talk**: Hadronic seminar series, McGill University, Montreal, Canada, March 2022.

- **Talk:** Invited seminar in Physics department (as part of the department seminar series), Indian Institute of Technology Gandhinagar, August 26, 2021.

- **Talk:** International Conference on Strangeness in Quark Matter (SQM 2021) (virtual), Sponsored by Brookhaven National Laboratory (BNL), New York, US, May 18, 2021.

- **Talk:** DAE-BRNS High Energy Physics (HEP) Symposium (virtual), NISER, Bhubaneswar, India, December 15, 2020.

- **Talk**: DAE-BRNS symposium on Contemporary and Emerging Topics in High Energy Nuclear Physics (CETHENP 2019), VECC, Kolkata, India, November 25-27, 2019.

- **Talk**: Nuclear theory group, McGill University, Montreal, Canada, as part of Overseas research experience fellowship program, July 2019.

- **Poster presentation**: Third Heavy Flavour meet, Indian Institute of Technology, Indore, India, March 18- 20, 2019.

- **Talk:** International center for theoretical sciences (ICTS) program on "The Myriad Colorful Ways of Understanding Extreme QCD Matter" from April 1-17, 2019 (18 days).

- **Poster presentation**: XXIII DAE-BRNS High Energy Physics Symposium, Indian Institute of Technology, Madras, India, December 10-14, 2018.

- **Talk**: Young Physicist's Meet (YPM), Physical Research Laboratory, Theoretical Physics Division, Ahmedabad, India, April 24-27, 2018.

- **Talk**: CNT Workshop on Effective Field Theory of Hadrons: Vacuum to Medium, Variable Energy Cyclotron Center (VECC), Kolkata, India, March 12-17, 2018.

- **Poster presentation**: 62nd DAE Symposium (Department of Atomic Energy) on Nuclear Physics, Thapar University Patiala, Punjab, India, December 20-24, 2017.

- **Talk:** SERC School in Theoretical High Energy Physics (THEP), Indian Institute of Technology Gandhinagar, India, Sept 5 - Oct 1, 2016.