

Curriculum Vitae

Hariprashad Ravikumar

Physics PhD Candidate
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Date of birth : March 08, 1998

Nationality : Indian

Language Proficiency : English, Tamil

Education

08/09/2021 - Present	PhD Physics	New Mexico State University, USA
08/09/2021 - 05/10/2024	MS Physics	New Mexico State University, USA
07/15/2019 - 05/22/2021	MSc Physics	National Institute of Technology Jalandhar, Punjab, India
06/15/2015 - 05/22/2018	BSc Physics	Dr.N.G.P. Arts and Science College, Coimbatore, India

PhD Research

Doctoral advisor: **Dr. Michael Engelhardt** (New Mexico State University, USA)

- **Lattice QCD calculations of TMDs**

- My PhD research involves calculating and analyzing the longitudinal momentum fraction dependence of Transverse Momentum Dependent Parton Distribution Functions (TMDs), such as Sivers shifts (for the SIDIS and DY cases) in dynamical lattice QCD employing non-local operators with staple-shaped process-dependent Wilson lines.

Other Current Research

- Research Collaborators: **Dr. Rajan Gupta & Dr. Tanmoy Bhattacharya** (Los Alamos National Laboratory, USA)

- **Lattice QCD calculations of CP violation contribution to nEDM**

- My research involves lattice QCD calculations of the hadronic matrix elements needed to connect nucleon Electric Dipole Moments (EDMs) to Standard Model (SM) and Beyond Standard Model (BSM) physics. This project is supported by a Travel Grant from the New Mexico Consortium at Los Alamos.

- Research Collaborator: **Dr. Chueng-Ryong Ji** (North Carolina State University, USA)

- **Interpolating conformal algebra between the instant form and light front form of relativistic dynamics**

- My research involves studying the conformal invariance of high-energy scattering processes in the interpolating form dynamics, where the interpolation angle parameter spans between the instant form dynamics (IFD) and the light-front dynamics (LFD).

Selected Talks

1. (Jun. 07, 2024) "[Lattice QCD calculations of Sivers TMD x dependency](#)", 2024 CFNS Summer School on the Physics of the Electron-Ion Collider, **Center for Frontiers in Nuclear Science**, Stony Brook University, NY, USA
2. (May 16, 2024) "[Lattice QCD calculations of x dependence of Sivers TMD](#)", T-2 Seminar, Theoretical Division (T-2), **Los Alamos National Laboratory**, USA
3. (June 15, 2023) "[Lattice QCD calculations of TMDs](#)", HUGS Student Seminar Presentation, **Thomas Jefferson National Accelerator Facility**, Newport News, USA

For a full list of talks, please visit: <https://hariprashad-ravikumar.github.io/talks>

MSc Thesis

(2021, August). **The Poincaré Algebra Interpolation between Instant Form Dynamics (IFD) and Light Front Dynamics (LFD)** (Master's thesis). Dr.B.R. Ambedkar National Institute of Technology Jalandhar, India.

Advisors: **Prof. Harleen Dahiya** (NIT-J, India), in collaboration with **Prof. Chueng-Ryong Ji** (North Carolina State University, USA).

Conference Publication

(2021, December). **Interpolating conformal algebra between the instant form and the front form of relativistic dynamics**. In Light Cone 2021: Physics of Hadrons on the Light Front, Jeju Island, South Korea. Abstract: <https://indico.cern.ch/event/938795/contributions/4605229/>

Internships & Schools Attended

1. (June 03 - June 14, 2024) **CFNS Summer School on the Physics of the Electron-Ion Collider Center for Frontiers in Nuclear Science**, Stony Brook University, New York, USA.
 2. (May 30 - June 16, 2023) **Hampton University Graduate Studies (HUGS) Summer Program at Thomas Jefferson National Accelerator Facility**, Newport News, USA, with the HUGS scholarship.
 3. (Jan. 20 - 26, 2022) **2022 TMD Winter School**, Santa Fe, USA.
 4. (June 21 - 25, 2021) **2021 National Nuclear Physics Summer School (NNPSS)**, at the Universidad Nacional Autónoma de México, Mexico, and Indiana University, USA (online).
 5. (June 04 - Aug. 03, 2018) **2018 Astrophysics Summer School: An Observational View of the Universe** at the **Indian Institute of Astrophysics**, Bengaluru, India, with the **Indian Academy of Sciences IASC-INSA-NASI Summer Research Fellowship**.
 - I studied the photospheric and chromospheric features and Coronal activities using the data from Kodaikanal Solar Observatory under the guidance of Prof. B. Ravindra (Indian Institute of Astrophysics, Bengaluru).
 6. (July 02 - 06, 2018) **2018 Radio Astronomy Summer School** at the **National Centre for Radio Astrophysics - Tata Institute of Fundamental Research**, Pune, India.
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Workshops & Courses Attended

1. (Dec. 14 - 18, 2020) **XXIV The Department of Atomic Energy (DAE) - Board of Research in Nuclear Sciences (BRNS) Symposium in High Energy Physics** at the **National Institute of Science Education and Research**, India (online).
 2. (Nov. 02 - 11, 2020) **International Workshop on Applications of Group Theory in Physics** at the Department of Physics, **Assam University**, Silchar, India (online).
 3. (Sept. 18 - 22, 2020) **Short-Term Course on Advances in High Energy Physics** at the **National Institute of Technology Jalandhar**, India (online).
 4. (Dec. 18 - 21, 2017) **National Workshop on Theoretical Physics** at **Ramakrishna Mission Vivekananda Educational and Research Institute**, Kolkata, India.
 5. (Sept. 11 - 16, 2017) Global Initiative of Academic Network's course on **Introduction To Light Front Hadron Physics** by **Prof. Stanley J Brodsky** (Stanford University / SLAC) and **Prof. Chueng-Ryong Ji** (North Carolina State University) at **Mumbai University**, India.
 6. (July 03 - 13, 2017) Global Initiative of Academic Network's course on **The Field Theory Of Classical And Quantum Phase Transition** by **Prof. Flávio S Nogueira** (Institute for Theoretical Solid State Physics, Germany) at the **National Institute of Technology Goa**, India.
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Computer Programming Skills

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| • C++ | • Bash | • HTML |
| • CHROMA | • MATLAB | • \LaTeX |
| • Lua | • Mathematica | • GitHub |
| • Python | • Qiskit | |
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Highlights

- Recipient of the 2023 **George and Barbara Goedecke Physics Excellence Fund Scholarship**, awarded by the NMSU Physics Department.
 - Recipient of the 2021 **Graduate Success Scholarship**, awarded by the NMSU Graduate School.
 - Nominated for participation in the **70th Lindau Nobel Laureate Meeting 2020, Germany**, by the **Department of Science & Technology, Government of India**.
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Graduate Assistantships

- Teaching Assistant
 - (Fall 2021 & Spring 2022)- PHYS-1320L-CALCULUS-BASED PHYSICS (E&M) II LAB - NMSU - Duties: Conducting labs, lectures, tutoring, and grading
 - (Fall 2022)- PHYS-2110L-EXPERIMENTAL MECHANICS LAB - NMSU - Duties: Conducting labs, lectures, tutoring, and grading
 - (Spring 2023) - PHYS-1311-M01-PROB IN CALC-BASED PHYSICS I - NMSU (Supplemental Instructor)- Duties: Lectures, tutoring, and grading
- Research Assistant
 - (Summer 2022 & Fall 2022 - Spring 2025) - under Dr. Michael Engelhardt, NMSU - Duties: Conducting research in lattice QCD for my Ph.D. research