

BRANDON MANLEY

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EDUCATION

The Ohio State University

Aug. 2021 – Present

Ph.D in Physics

Columbus, Ohio, USA

- Advisor: Prof. Yuri Kovchegov

M.S. in Physics

Aug. 2021 – Aug. 2023

- Thesis: Soft and Collinear Interactions in an Effective Field Theory

B.S. in Physics, Magna Cum Laude

Aug. 2017 – May 2021

- Honors Thesis Advisor: Prof. Stuart Raby
- Honors Thesis: Symmetries in Physical Theories

RESEARCH INTERESTS AND EXPERTISE

- Quantum chromodynamics at high energies: small- x evolution and gluon saturation
- Spin physics: nucleon spin puzzle, orbital angular momentum, helicity parton distribution functions
- Phenomenology for the future Electron Ion Collider

PUBLICATIONS

1. *Elastic Dijet Production in Electron Scattering on a Longitudinally Polarized Proton at Small x : A Portal to Orbital Angular Momentum*
Yuri V. Kovchegov, **Brandon Manley**
[arXiv:2410:21260](https://arxiv.org/abs/2410.21260)
2. *Orbital Angular Momentum Small- x Evolution: Exact Results in the Large- N_c Limit*
Brandon Manley
[JHEP 04 \(2024\) 055](https://arxiv.org/abs/2404.055)
3. *Orbital Angular Momentum at Small x Revisited*
Yuri V. Kovchegov, **Brandon Manley**
[JHEP 02 \(2024\) 060](https://arxiv.org/abs/2402.060)
4. *Sensitivity to millicharged particles and future proton-proton collisions at the LHC with the milliQan detector*
A. Ball et al. (incl. **Brandon Manley**)
[Phys.Rev.D 104 \(2021\) 3, 032002](https://arxiv.org/abs/2103.03202)
5. *Search for millicharged particles in proton-proton collisions at $\sqrt{s} = 13$ TeV*
A. Ball et al. (incl. **Brandon Manley**)
[Phys.Rev.D 102 \(2020\) 3, 032002](https://arxiv.org/abs/2003.03202)

PROCEEDINGS

1. *Orbital Angular Momentum at Small x Revisited*
Brandon Manley
Contribution to SPIN 2023 proceedings
[DOI:doi.org/10.22323/1.456.0183 \(2024\)](https://arxiv.org/abs/2401.45601)
2. *Orbital Angular Momentum at Small x Revisited*
Brandon Manley
Contribution to DIS 2023 proceedings
[arXiv:2307.09544 \(2023\)](https://arxiv.org/abs/2307.09544)

PRESENTATIONS

- **May 2024: DeMartini poster competition**, Ohio State University, OH, USA
Poster: Orbital Angular Momentum at Small x
- **Mar. 2024: Hayes Research Forum**, Ohio State University, OH, USA
Contributed talk: Proton Structure at High Energies
- **Sep. 2023: SPIN 2023**, Durham, NC, USA
Contributed talk: Orbital Angular Momentum at Small x Revisited
- **Jun. 2023: SURGE Collaboration Meeting**, Brookhaven National Lab, NY, USA
Contributed talk: Updates on OAM at Small x
- **Mar. 2023: DIS 2023**, Lansing, MI, USA
Contributed talk: Orbital Angular Momentum at Small x Revisited
- **Mar. 2022: HUGS Summer School**, Jefferson Lab, VA, USA
Contributed talk: Orbital Angular Momentum at Small x
- **Apr. 2020: Spring Undergraduate Research Festival**, Ohio State University, OH, USA
Poster: [Machine Learning Approach to Solve the Chaotic N-Body Problem](#)
- **Aug. 2020: Autumn Undergraduate Research Festival**, Ohio State University, OH, USA
Contributed talk: Search for millicharged particles in proton-proton collisions at $\sqrt{s} = 13$ TeV
- **Sep. 2020: Boston University Symposium**, Boston, MA, USA
Invited talk: Search for Millicharged Particles with the MilliQan Detector

RESEARCH EXPERIENCES

The Ohio State University <i>Graduate Research Assistant</i> Advisor: Prof. Yuri Kovchegov (Department of Physics, OSU)	Aug. 2021 – Present <i>Columbus, OH, USA</i>
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- Small x contribution of the OAM distributions to the nucleon spin rule
- Small x evolution of polarized dipole amplitudes and their moments
- Numerical analysis of the helicity PDFs and orbital angular momentum distributions at small x
- Singular behavior of twist-3 GPDs near $x = 0$

The Ohio State University <i>Undergraduate Research Assistant</i> Advisor: Prof. Chris Hill (Department of Physics, OSU)	Aug. 2017 – May 2021 <i>Columbus, OH, USA</i>
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- Data analysis for the milliQan experiment in the search for millicharged particles
- Detector design and benchmark testing for the milliQan experiment
- GUI for the next generation pixel detector for the CMS experiment

The Ohio State University <i>Undergraduate Research Assistant</i> Advisor: Prof. Stuart Raby (Department of Physics, OSU)	Aug. 2020 – May 2021 <i>Columbus, OH, USA</i>
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- General symmetry structure of gauge theories and their application to isospin symmetry breaking

Kent State University <i>Research Assistant</i> Advisor: Prof. Oleg Lavrentovich (Department of Physics, KSU)	May 2016 – Aug. 2016 <i>Kent, OH, USA</i>
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- Structures and anisotropies of lyotropic chromonic liquid crystals

HONORS AND AWARDS

- **2024: Presidential Fellowship**, OSU, Columbus, OH, USA
- **2024: First place, DeMartini poster competition**, OSU, Columbus, OH, USA
- **2024: Third place in Hayes Research Forum**, OSU, Columbus, OH, USA
- **2020: Summer Research Scholarship**, OSU, Columbus, OH, USA
- **2019: Summer Research Scholarship**, OSU, Columbus, OH, USA
- **2017: Maximus Merit Scholarship**, OSU, Columbus, OH, USA
- **2016: Believe in Ohio Scholarship**, Columbus, OH, USA

TEACHING EXPERIENCE AND SERVICE

Department of Physics, OSU

Aug. 2021 – Present

Graduate Teaching Assistant

Columbus, OH, USA

- Introductory Physics – Electromagnetism, Optics, Modern Physics (Head TA)
- Intermediate Classical Mechanics
- Quantum Field Theory

Department of Mathematics, OSU

Aug. 2019 – May 2021

Undergraduate Teaching Assistant

Columbus, OH, USA

- Precalculus
- Trigonometry

Student Athlete Support Services Office, OSU

Aug. 2018 – May 2019

Tutor

Columbus, OH, USA

- Calculus I, II, and III
- Introductory Physics – Electromagnetism, Optics, Modern Physics
- Intermediate Classical Mechanics

SERVICE

Society of Physics Students

Oct. 2023 – Present

Volunteer for Adopt-a-Physicist program

Columbus, OH, USA

Believe in Ohio

Apr. 2023 – Present

Volunteer Judge

Columbus, OH, USA

TECHNICAL SKILLS

Programming Languages: Python, C++, WolframScript, Julia

Technologies/Frameworks: Mathematica, ROOT, GitHub, tensorflow

REFERENCES

Yuri Kovchegov
Professor of Physics
The Ohio State University
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Chris Hill
Professor of Physics
The Ohio State University
chill@physics.osu.edu

Parisa Roustazadeh
Lecturer and Course Manager
The Ohio State University
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