

Ryan Marin

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EDUCATION

Princeton University, Physics, A.B.

2021 – 2025
Princeton, NJ

- **GPA:** 3.7/4.0
- **Awards:** *Manfred Pyka Memorial Physics Prize* (x2): given to outstanding Physics undergraduates for excellence in course work (2022, 2023)
- **Activities:** Princeton Climbing Team, Rock Ensemble, Tiger Capital Management, Whig-Clio

Relevant Coursework:

- **Undergrad:** Statistical Mechanics, Quantum Theory, Adv. Electrodynamics, Experimental Physics, Stochastic Processes, Differential Geometry, Complex Analysis, Algebraic Geometry
- **Graduate:** Quantum Field Theory, String Theory, Black Holes & High Energy Gauge Theories, General Relativity, Algebraic Topology

San Juan Hills High School, General Studies, Valedictorian

2017 – 2021
San Juan Capistrano, CA

- **GPA/ACT/SAT:** 4.000/4.924, 36/36, 1580/1600
- **Awards:** *U.S. Physics Olympiad Semifinalist* (2020), *National AP Scholar* (2021)

RESEARCH

Nonfactorization in AdS_2 Quantum Gravity, Senior Thesis

2024 – 2025
Princeton, NJ

- Wrote a 122-page review of modern advances in low-dimensional quantum gravity, JT gravity and its adaptation as a coset-model $\text{SL}(2, \mathbb{R})$ BF theory, interpreting the Saad-Shenker-Stanford ensemble model and its connections to modern complexity theory.
- Mentored by Juan Maldacena, *Carl P. Feinberg Professor*, Institute for Advanced Study

\mathcal{C}^k -regular extremal black holes in maximally-symmetric spacetime and the third law of black hole thermodynamics, Undergraduate Research, Junior Paper

2023 – 2024
Princeton, NJ

- Adapted Kehle–Unger “null-cone gluing” to curved spacetime, proving the first construction of extremal Reissner–Nordström black holes from smooth Cauchy data, providing a counter-example and analysis to the classical “third law” of black-hole thermodynamics in dS_4/AdS_4
- Written under guidance of Mihalis Dafermos, *Professor*, Princeton department of Mathematics, preprint published on Arxiv/2411.17938

Toward a resolution of the black hole information paradox: the quasi-analytic transition between self-gravitating strings and black holes, Undergraduate Research, Junior Paper

2024
Princeton, NJ

- Literature review of self-gravitating string solutions within M-theory landscape
- Interpreted Witten-Maldacena-Chen entropy methods and Horowitz-Polchinski mechanism
- Written under Nissan Itzhaki, *member*, School of Natural Sciences, Institute for Advanced Study

Myers-Perry 4+1 black holes via superradiance and null geodesic trapping, Undergraduate Research

2023
Mission Viejo, CA

- Researched stability of Myers-Perry black holes within landscape of high-dimensional black hole solutions via PDE modeling of null geodesic trapping and superradiance
- Mentored by Dr. Gabriele Benomio, *Postdoctoral Fellow*, Princeton University

Princeton Gravity Initiative, Undergraduate Research Assistant

2022
Princeton, NJ

- Lab assistant to Dr. Saptarshi Chaudhuri, Lyman Page Gravity Lab
- Prototyped a resonator for analysis of Axion signatures from the Princeton Dark Matter Radio

FINANCE

Jane Street, Quantitative Trading Intern

2024
New York City, NY

- Over the course of 11 weeks, developed two projects on Options and Domestic ETF desks
- Attended daily courses on algorithms, mathematical modeling, and live trading

Tiger Capital Management, Analyst; Technology (2021), Industrials & Energy (2022)

2021 – 2023
Princeton, NJ

- Produced company models, DCFs, wrote and pitched stock evaluations
- Balanced portfolio for oldest, most competitive (<3%) fund at Princeton (>150k AUM)

MISCELLANEOUS

Technical Skills: Python, Java, LaTeX, Mathematica, MATLAB, Excel, Machining & Soldering

Languages: English [Native], French [C1], Mandarin Chinese [B1], Akkadian [A2]

Interests: Linguistics, Rock Climbing, Jazz, Aviation, Category Theory, Metaphysics