

# Noah Paladino

## Curriculum Vitae

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## Education

- Expected May 2021 **Bachelor of Science, Rutgers University**, New Brunswick, NJ  
**Major:** Physics  
**Minor:** Math  
**GPA:** 4.00  
**Relevant Coursework:** Classical Mechanics, Classical Electromagnetism, Modern Physics, Graduate Quantum Mechanics, Graduate Particle Physics, Graduate Quantum Field Theory, Graduate Large Scale Data Analysis, Thermal Physics, Mathematical Physics, Differential Equations, Partial Differential Equations, Linear Algebra, Digital Logic Design
- June 2017 **High School Diploma, Middlesex County Academy for Science, Mathematics, and Engineering Technologies**, Edison, NJ  
**Concentration:** Electrical and Computer Engineering  
**Rank:** Top 5 in graduating class  
**Relevant Coursework:** Digital Logic Design, C++ Programming, DC Circuit Analysis, Computer Architecture, Digital Communication Systems, AC Circuit Analysis, Capstone Project

## Research Experience

- 2018 – Present **Rutgers University Physics, Prof. Stephen Schnetzer**  
I work on analyzing data from the Compact Muon Solenoid (CMS) experiment at CERN. Through studying proton-proton collisions at a center of mass energy of 13 TeV produced by the Large Hadron Collider (LHC), I search for evidence of bottom-type vector-like quarks (VLQs) present in many models involving a composite Higgs boson. I have been named a special coauthor on a CMS paper for one of the analyses I worked on. The submission has been published in Physical Review D: [102:112004](https://arxiv.org/abs/102.112004).
- Summer 2019 **Purdue University Physics, Prof. Andreas Jung**  
Through the REU Program in Physics at Purdue University, I worked on planned hardware upgrades for the CMS detector at CERN. In particular, I focused on thermal conductivity testing for the carbon fiber mounting system for the forward pixel tracker. I also designed and built the data acquisition and real-time monitoring system for a testbench for the tracker's mixed-phase CO<sub>2</sub> cooling system.
- 2017 – 2018 **Rutgers University Physics, Prof. Jacquelyn Noronha-Hostler**  
I worked with hydrodynamic simulations of quark-gluon plasma that resulted from heavy ion collisions. My involvement was focused on performance optimization by increasing computational efficiency and preparing files for initial condition generation. A paper is currently in review for publication in Physical Review C. The preprint version is listed on arXiv as [arXiv:1905.13323](https://arxiv.org/abs/1905.13323).
- Summer 2017 **Rutgers University Wireless Information Network Laboratory, (WINLAB)**  
I worked with a team of students and developed an effective means of safely taking control of WiFi-enabled drones to prevent them from posing a public safety hazard.
- Summer 2016 **Rutgers University Wireless Information Network Laboratory, (WINLAB)**  
I collaborated with a small group of students to design a drone capable of pinpointing sources of wireless interference, specifically in the cellular band of the spectrum, using software defined radio and adaptive flight planning.

## Publications

CMS Collaboration. Search for bottom-type, vectorlike quark pair production in a fully hadronic final state in proton-proton collisions at  $\sqrt{s} = 13\text{TeV}$ . *Phys. Rev. D*, 102:112004, Dec 2020.

Douglas Wertepny, Jacquelyn Noronha-Hostler, Matthew Sievert, Skandaprasad Rao, and Noah Paladino. Ultracentral collisions of small and deformed systems at RHIC. *Nuclear Physics A*, 1005:121839, Jan 2021.

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## Talks

- 19 April 2020 **A Combined Search for Pair-Produced Vector-Like Quarks in 13 TeV  $pp$  Collisions Using CMS Data**, *APS April Meeting 2020, 19 April 2020, Washington D.C. (Moved to Remote)*
- 19 May 2020 **Combining Hadronic and Dileptonic Searches for Pair-Produced Bottom-Type Vector-Like Quarks**, *CMS B2G Workshop 2020, 19 May 2020, Remote*

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## Awards

- 2020 **Goldwater Scholar**, *The Barry Goldwater Foundation*  
I was selected as a 2020 Goldwater Scholar, a national undergraduate scholarship in the sciences, mathematics, and engineering.
- 2019 **Robert L. Sells Scholarship**, *Rutgers University Department of Physics and Astronomy*  
I was selected as a recipient of the Robert L. Sells Scholarship, awarded to high-achieving physics students at Rutgers University.
- 2017 – 2021 **Rutgers Presidential Scholarship**, *Rutgers University*  
I was awarded the highest level of merit scholarship offered by Rutgers University upon admission.
- 2017 – Present **Dean's List**, *Rutgers University*  
I was included on the Dean's List every semester since my enrollment in Fall 2017.

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## Skills

- Programming Languages** C++, C, Python, Mathematica, Matlab, Verilog, MPASM Assembly, Java, C#, JavaScript, HTML/CSS, PHP, Markdown,  $\LaTeX$
- Frameworks** ROOT, Matplotlib, Numpy, CUDA, Qiskit, Jekyll, Flutter, Windows Presentation Foundation, Android SDK
- Linux** Server Administration, Shell Scripting, High-Performance Computing Administration, Metal as a Service (MAAS) Deployment
- Hardware** FPGA Development, Digital Logic Design, DC Circuitry, Microcontroller Programming

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## Leadership Positions

### Rutgers Society of Physics Students

- 2020 – Present *President*
- 2019 – 2020 *Secretary*
- 2019 – Present *Lead Cluster Administrator*
- 2018 – Present *Webmaster*

### Rutgers Astronomical Society

- 2018 – 2019 *Webmaster*

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## Projects

- 2019 – Present **Rutgers University SPS Cluster**, *High Performance Computing*  
I am in charge of the formation, development, and administration of the computing cluster initiated by the Rutgers Society of Physics Students. With the assistance of the physics department and a university grant, the cluster is being constructed as a teaching and research resource for student, featuring the largest GPU computing capability accessible to physics students at Rutgers University.
- 2019 – Present **py2700**, *Python Package*  
The py2700 Python package provides a simple way for Python scripts to interact with Keithley 2700 series digital multimeters, popular in physics applications. The package is published in the official Python package repository, the Python Package Index (PyPI).

- 2020 – Present **RAC Sound Study, Physics Outreach Initiative**  
I led a study of the sound properties of the Rutgers Athletic Center, widely regarded as one of the loudest arenas in college basketball. The project was a collaborative effort between Rutgers Athletics and the Society of Physics Students. This outreach initiative involved taking data at multiple games and releasing a report with the goal being to encourage basketball fans both young and old to learn more about physics. More than 1200 fans read the report and it was well received by the community on social media.
- 2016 – 2017 **VICTR, Capstone Project**  
VICTR is a voice-activated virtual assistant for racquetball. It provides a projected scoreboard and game management system programmable via a mobile app. Live scores can be viewed remotely by tournament organizers and fans via the web or the mobile app.
- 2015 – 2017 **Kaldersvell OS, Linux Distribution**  
Kaldersvell OS was a Linux-based operating system and companion Windows application for Raspberry Pi that creates a simple way for students to remotely write and run their Python code. The project has been discontinued but older versions are still accessible via GitHub.

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## Work Experience

- Summer 2017 **Rutgers Old Queens Technical Support, Help Desk**  
I provided general computer support for the Rutgers Old Queens campus administrative buildings and performed maintenance work for the network. I also helped set up new computers and managed the safe disposal of hard drives containing sensitive information.
- Summer 2014, **Rutgers Old Queens Technical Support, Intern**  
Summer 2015 I gained experience with computer networking as well as set up and managed Linux servers. In addition, I restored decommissioned backup servers to working order.