

Nicholas Fasano

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EDUCATION

Princeton University, Princeton, NJ

Doctor of Philosophy in Applied Physics, GPA: 3.683/4.0

May 2023

Master of Arts in Applied Physics, GPA: 3.683/4.0

April 2019

Syracuse University, Syracuse, NY

May 2017

BS in Aerospace Engineering, BS in Physics, Minor in Mathematics

Graduated Summa Cum Laude, GPA: 3.932/4.0

TECHNICAL SKILLS

Programming: Python (Numpy, Pandas, Scikit-learn), SQL, Matlab, High performance computing, PowerPoint

Statistics/Machine Learning: *Regression* (Linear, Lasso/Ridge), *Classification* (SVM, Random forest, Decision trees, Logistic, Naïve Bayes, KNN), Unsupervised (SVD, PCA, k-means, LDA), data cleaning/preprocessing

RESEARCH EXPERIENCE

Postdoctoral Research Associate | Princeton University MAE

June 2023 – Present

- Using large simulation and experimental datasets to push the frontiers in plasma optics
- Mentored undergraduate and graduate students by guiding the advancement of their research projects

Graduate Researcher | Princeton University MAE

Sept. 2017 – May 2023

- Curated and analyzed terabyte-scale simulation data, utilizing linear regression and statistical methods to show that plasma-based optics are a practical choice for manipulating intense light sources
- Led an experimental campaign on Princeton's 20TW laser system to study waveform-controlled light-matter interactions, resulting in two conference presentations and a written manuscript
- Collaborated with teams from national labs and academia, where I co-designed and executed experiments

Undergraduate Researcher | Syracuse University MAE

June 2016 – Aug. 2016

- Researched and designed a 4-arc turbine blade. Used C++ to generate the blade in a 3D CAD software

SELECTED DATA SCIENCE PROJECTS (github.com/nfasano)

Content-based movie recommendation system

Jan. 2023 – Present

- Webscraped, cleaned, and preprocessed a dataset of 160,000+ film scripts using NLP techniques
- Built a topic model (latent Dirichlet allocation) to identify movies with similar content and then ranked the movie recommendations using cosine-similarity. Deployed recommender as a web app using gradio

Sentiment classifier for Black Lives Matter tweets

Jan. 2021 – May 2021

- Built a classifier to predict if a tweet was positive or negative toward the Black Lives Matter movement, utilizing pandas, scikit learn, hypothesis testing, and evaluation metrics (F1-score, precision, recall)

LEADERSHIP AND TEAMWORK EXPERIENCE

Assistant in Instruction | Princeton University

Jan. 2019 – Jan. 2023

- Led problem-solving precepts, aided in project development, and advised students via office hours

Physics Coach (Tutor) | Syracuse University

Sept. 2016 – May 2017

- Mentored students individually or in small groups, covering topics in physics, math, and engineering

WORK EXPERIENCE

Engineering Intern | Cameron Engineering & Associates, LLP

May 2015 – Aug. 2015

- Read and edited electrical and mechanical drawing plans using AutoCAD
- Performed on-site visits to survey and update electrical and mechanical engineering drawings

Maintenance | Piquet Lane Swim and Tennis Club

Summers 2013-2014

- Responsible for daily maintenance of tennis courts and other day to day operations of the club

CERTIFICATES AND AWARDS

Teaching Transcript Certificate McGraw Center for Teaching, Princeton University	Dec. 2022
Andrew Ng's Deep Learning Specialization Coursera	Sept. 2021
Fellowship Awarded by Program in Plasma Science and Technology	June 2020 – May 2023
Gelling Award Awarded by Physics faculty of Syracuse University	May 2017
Excellence by Aerospace Engineer Awarded by MAE faculty of Syracuse University	May 2014 - 2017

SELECTED PUBLICATIONS AND PRESENTATIONS

Google Scholar: scholar.google.com/citations?user=X9sdXuQAAAAJ&hl=en&oi=ao

- **N. M. Fasano**, M.R. Edwards, A. Giakas, et al., "Enhanced Relativistic Harmonic Generation using Plasma-Mirror-Shaped Laser Waveforms," To be submitted.
- **N. M. Fasano**, M. R. Edwards, and J. M. Mikhailova, "Electron bunch dynamics and emission in particle-in-cell simulations of relativistic laser-solid interactions: on density artifacts, collisions, and numerical dispersions," *Physics of Plasmas* 30, 063904 (2023).
- **N. M. Fasano**, M. R. Edwards, A. Giakas, et al., "Low-Order Harmonics Emitted from Relativistic Plasma Mirrors Driven by Two-Color and Elliptically Polarized Lasers," APS DPP meeting, Bulletin of the American Physical Society, (2021). Oral.
- **N. M. Fasano** and J. M. Mikhailova, "High-Power Ultraviolet Vortex Beams Generated from a Relativistic Laser Interacting with an Ultrathin Foil," CLEO: Conference on Lasers and Electro-Optics, (2021). Oral.
- M. R. Edwards, **N. M. Fasano**, T. Bennett, et al., "A multi-terawatt two-color beam for high-power field-controlled nonlinear optics", *Optics Letters* **45**, 6542 (2020).
- M. R. Edwards, **N. M. Fasano**, and J. M. Mikhailova, "Electron-nanobunch-width-dominated spectral power law for relativistic harmonic generation from ultrathin foils", *Physical Review Letters* **124**, 185004 (2020).