

Inquisitive, detail-oriented, and collaborative computational scientist with ten years of experience, including four years in investment management and six years contributing to research in computational physics. Skilled in analytical modeling, data analysis, programming, machine learning, parallel & distributed computing, and finance. Talented, effective communicator to technical and non-technical audiences alike, with a rich history of teaching, advising, and leadership.

## EXPERIENCE

### RESEARCH AFFILIATE

APR 2024 — PRESENT

Georgia Institute of Technology | Atlanta, GA

- Conduct active NASA-funded research in computational space physics within the solar system in collaboration with the *Magentospheres in the Outer Solar System* research group; provide mentorship to doctoral and undergraduate researchers and help guide the group's strategic research directions.
- Design and operate retail sentiment classification tools for large social media datasets to characterize behavioral trends in retail investing; programmed in Python using large language models (LLMs) and large relational financial market databases including Datastream and CRSP.
- Develop classification models driven by artificial intelligence that assess the probability that investment strategies communicated across social media are likely to perform better than appropriate market benchmarks; created in Python and trained using a distributed computing environment.

### GRADUATE RESEARCH SCIENTIST

AUG 2018 — MAY 2024

School of Physics, Georgia Institute of Technology | Atlanta, GA

Selected Awards: Herbert P. Haley Fellowship, Georgia Tech Quantum Alliance Fellowship (x2)

- Programmed numerical models in C++ to study space physics at Jupiter's largest moons in distributed computing environment; published peer-reviewed articles on research results in leading space physics journal.
- Translated broad scientific research goals into quantitative questions that could be answered by combining simulated model results with empirical data (e.g., *in situ* spacecraft time-series measurements).
- Applied statistical techniques (e.g., minimum variance analysis, multivariate regression, distribution sampling) to large, complex datasets to extract key signatures of space plasma interaction dynamics using Python.
- Spearheaded a collaborative research project on recent NASA mission to Jupiter, resulting in a cover-story article in top geophysical journal; mentored several new graduate and undergraduate students, helping them establish research objectives and computational modeling experience.
- Leveraged machine learning and artificial intelligence techniques to enhance data integrity and completion, employing Python and TensorFlow to develop adaptable models for use across data science and physics.
- Presented scientific results to both highly specialized and general audiences at several invited talks, including corporate (Google Quantum AI), student (GT Quantum Alliance), and intl. scientific bodies (AGU).
- Developed and operated sophisticated data processing, analytics, and visualization pipeline using Python, SQL, and NASA's SPICE API for spacecraft and ephemeris data.

### UNDERGRADUATE RESEARCH ASSISTANT

AUG 2016 — MAY 2018

School of Physics, Joint Quantum Institute, University of Maryland | College Park, MD

- Implemented quantitative models of custom laboratory circuitry and designed novel electrical devices in support of an experiment studying controllable disorder in ultracold quasi-2D Bose gasses.
- Developed and operated original bespoke circuit for levitating quantum condensates during imaging procedures; this device facilitated high-resolution data acquisition for several peer-reviewed publications.
- Programmed numerical implementation of model of the system under experimental study in Matlab.

### OWNER

OCT 2012 — AUG 2014

Steelfire Investments, LLC | Bethesda, MD

- Founded an investment firm anchored in contemporary academic research on optimal construction methodologies for equal-weighted index-oriented portfolios in U.S. and international equities.
- Acquired investment advisor licensing and instantiated investment management company and first investment fund; implemented portfolio construction protocols using optimization techniques in conjunction with a complex data pipeline created with standard industry tools & APIs (e.g., Datastream).

## ANALYST

OCT 2008 — SEP 2011

### Strategic Investment Group, LLC | Rosslyn, VA

- Collaborated with asset class managers and head portfolio manager to select optimal investments for large institutional portfolios (>\$1 bil) spanning all asset classes through the application of investment analysis, asset allocation techniques, financial data analysis, and manager due diligence.
- Addressed multifaceted investment challenges, including managing complex cash flows, liquidity demands, and tax issues, by deploying a mix of active and passive investment strategies tailored to client policies.
- Oversaw performance metrics, risk assessments, and benchmarking analyses for key clients, ensuring accurate reporting and proactive client engagement through regular presentations and analytical discussions.
- Led development of new data analytics pipeline for informing daily futures trading and rebalancing activity, with resulting product adopted firm-wide; personally received Strategic's annual *Brilliant Alpha* award.

## CO-FOUNDER, FUND MANAGER

Nov 2007 — MAY 2008

### Undergraduate Student Investment Fund, University of Southern California | Los Angeles, CA

- Co-founded inaugural Undergraduate Student Investment Fund at USC; contributed to initial capital campaign and designed the fund's operating manual, portfolio management framework and fund manager roles.
- Programmed quantitative model for the fund's completion portfolio utilizing regression techniques with the Fama-French model to minimize the fund's tracking error with respect to its S&P 500 benchmark.

## EDUCATION

PHD IN PHYSICS, GEORGIA INSTITUTE OF TECHNOLOGY

MAY 2024

BS IN PHYSICS, UNIVERSITY OF MARYLAND - COLLEGE PARK

MAY 2018

BA IN BUSINESS, UNIVERSITY OF SOUTHERN CALIFORNIA

MAY 2008

## SKILLS

PROGRAMMING LANGUAGES: Python • C++ • SQL

COMPUTATIONAL TOOLS: SciPy | NumPy • Pandas • Matplotlib • TensorFlow | Keras

TOOLS & ENVIRONMENTS: Git • Conda • Jupyter • Spyder • Linux | MacOS | Windows • Bash

MATH: Vector calculus • Stochastic calculus • ODEs | PDEs • Bayesian Statistics • Probability

FINANCE: Time series analysis • Portfolio optimization • Monte Carlo • Bloomberg Terminal

MISCELLANEOUS: Excel with VBA • PowerPoint • Tableau • MS Teams •  $\LaTeX$

PROFESSIONAL DEVELOPMENT: Series 65 • CFA Level 1 Candidate (Nov. 24)

## RECENT PUBLICATIONS

- [1] **Aaron Stahl**, Peter Addison, Simon Sven, and Lucas Liuzzo. "A Model of Ganymede's Magnetic and Plasma Environment During the Juno PJ34 Flyby". In: *Journal of Geophysical Research: Space Physics* 128.12 (2023), e2023JA032113.
- [2] Peter Addison, C. Michael Haynes, **Aaron Stahl**, Lucas Liuzzo, and Sven Simon. "Magnetic Signatures of the Interaction Between Europa and Jupiter's Magnetosphere During the Juno Flyby". In: *Geophysical Research Letters* 51.2 (2024), e2023GL106810.
- [3] Lucas Liuzzo, Quentin Nénon, Andrew Poppe, **Aaron Stahl**, Sven Simon, and Shahab Fatemi. "On the Formation of Trapped Electron Radiation Belts at Ganymede". In: *Geophysical Research Letters* 52.2 (2024), 2024GL109058.
- [4] **Aaron Stahl** and Glen Evenbly. "Reconstruction of Randomly Sampled Quantum Wavefunctions using Tensor Methods". In: *arXiv preprint arXiv:2310.01628* (2023).

A complete list of publications and talks can be found in my CV on my website: <https://astahl3.github.io/cv/>