Shervin Sahba

Photonics and AI researcher, Physics PhD, teacher, & open-source contributor.

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education

2023	**PhD Physics** · University of Washington	
	Machine Learning for Aero-Optical Wavefront Characterization and Forecasting	
2021	**MS Applied Mathematics** · University of Washington	
2018	**MS Physics** · San Francisco State University	
	Photonic crystal bandgap transmission experiments and HPC cavity simulation	
2013	Certification in System Administration · UC Berkeley	
2009	BS Logistical Management · University of Rhode Island	
2009	BA Psychology · University of Rhode Island	

employment

2018-2023	**UW Department of Applied Mathematics** · Seattle, WA	
	Research Associate, Kutz Dynamics Lab. Created AI for photonic systems.	
2017-2021	**UW Department of Physics** · Seattle, WA	
	Teaching Assistant. Prepared, taught, and graded 100-500 level courses.	
2015-2017	**SFSU Department of Physics & Astronomy** · San Francisco, CA	
	Research Assistant, Man Photonics Group. Designed bandgap experiments and simulations.	
2014-2017	**Elite Educational Institute** · San Francisco, CA	
	Mathematics & Physics Instructor	
2013-2015	**Edge U Tutoring** · San Francisco, CA	
	Owner & Lead Tutor	
2012-2013	**Revolution Prep** · San Francisco, CA	
	SAT & ACT Instructor	
2011-2013	**Tastemakers International** · San Francisco, CA	
	Event Marketing Manager	

publications

Machine Learning for Aero-Optical Wavefront Characterization and Forecasting
  S Sahba. PhD Thesis (2023)

Wavefront sensor fusion via shallow decoder neural networks for aero-optical predictive control
  S Sahba, CC Wilcox, A McDaniels, SL Brunton, & JN Kutz. SPIE Interferometry XXI Proceedings (2022)

Dynamic mode decomposition for aero-optic wavefront characterization
  S Sahba, D Sashidhar, CC Wilcox, A McDaniels, SL Brunton, & JN Kutz. Optical Engineering (2021)

Local self-uniformity in photonic networks
  S Sellers, W Man, **S Sahba**, & M Florescu. Nature Communications (2018)

presentations
(p)oster / (t)alk

(p)	2023	Shallow Recurrent Decoder for Aero-Optical Wavefront Sensing. SPIE FiO+LS, Tacoma	
(t)	2022	Wavefront sensor fusion via shallow decoder networks. SPIE Optical Engineering, San Diego	
(t)	2020	Dynamic Mode Decomposition for Aero-Optical Wavefronts. Air Force Research Lab, Virtual	
(t)	2020	Taming Lasers in the Wild Sky. Town Hall Seattle by Engage Science, Virtual	
(p)	2016	Hyperuniform Disordered Photonic Bandgap Structures. ARCS NCC Symposium, Stanford	
(t)	2015	Photonic Crystals and Modern Applications. ARCS NCC SFSU Review, San Francisco	

honors

2020	AFRL Outstanding Scholar Award
2020	Air Force Research Lab Directed Energy Scholar
2019	UW Graduate Teaching Award
2017	UW Physics Department Fellowship Award
2017	SFSU Distinguished Achievement Award
2016	ARCS Northern California Scholarship
2016	Blue Waters Petascale Institute, selected participant
2016	SFSU College of Science & Engineering Student Project Showcase, 1st place winner
2015	ARCS Northern California Scholarship
2005	American Invitational Mathematics Examination, invited contestant

community involvement

Software Carpentry 2019-2022, Carpentries Instructor
Led tutorials in Linux, Python, R, and Git in live-coding workshops, bringing data tools to professional researchers.

UW Physics Slam 2019-2020, Host and organizer
Organized UW's first physics slam, bringing cutting-edge research to the public and fundraising for diversity in physics.

DRiP (Directed Reading in Physics) 2018-2019, Program organizer, Research mentor
Constructed a program to coach UW physics undergrads in research, fostering community and developing scientific literacy.

Career Development Organization for Physicists at UW 2018-2020, President, Conference organizer
Led an industry-meets-academia career conference, handling event logistics, marketing, fundraising, and programming.

Physics Graduate Student Committee 2017-2020, Event committee member
Hosted departmental socials for the UW Physics Department.

UW Physics Peer Mentor Program 2018-2019, Peer mentor
Introduced new PhD's to UW, providing guidance.

OSA, The Optical Society 2016-2017, SFSU Student Chapter President
Arranged the traveling lecturer series of talks, inviting faculty from abroad to visit SFSU.

teaching experience

2017-2021 Graduate Teaching Assistant · UW Physics
PHYS576 Modern Data Analysis Techniques
PHYS427 Quantum Computing & Information
PHYS423 Solid State Physics
PHYS325 Quantum Mechanics
PHYS324 Quantum Mechanics
PHYS224 Thermodynamics
PHYS121z Physics w/ Calc. Mechanics Lab
PHYS123 Physics w/ Calc. Waves & Optics Tutorial
PHYS122 Physics w/ Calc. Electromagnetism Tutorial
PHYS121 Physics w/ Calc. Mechanics Tutorial
PHYS118 General Physics Electromagnetism Lab
PHYS117 General Physics Mechanics Lab
PHYS116 General Physics Electromagnetism
PHYS115 General Physics Mechanics
2015-2016 Graduate Teaching Assistant · SFSU Physics & Astronomy
PHYS457 Principles of Electronics
PHYS360 Electricity and Magnetism
2014-2017 Mathematics & Physics Instructor · Elite Educational Institute
tutoring: SAT, SAT II, Precalculus, AP Calculus, AP Physics.
courses: Geometry, Precalculus, SAT Prep
2013-2015 Owner & Private Tutor · Edge U Tutoring
SAT, ACT, AP Calculus, AP Physics, AP Biology
2010-2013 SAT Instructor & Private Tutor · Revolution Prep
SAT, ACT, AP Physics

skills summary

programming	**Bash Shell**, C, Julia, LaTeX, Mathematica, MATLAB, **Python,** SQL
deep learning	**PyTorch**
computational	**Linux** administration, **high performance computing**, hardware support, **git**
physics	**photonics**, optics, condensed matter, quantum computing
applied math	computational and analytic analysis of **differential equations**, machine learning, AI
business	communications, finance, **public-speaking**, logistics, administration
other	teaching, web development, 3d-printing, game design, graphic design