

Mariel Pettee

Physics PhD Candidate at Yale University

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Education

2015 - Present	YALE UNIVERSITY PhD in Physics (Expected 2021)	New Haven, CT
2015	UNIVERSITY OF CAMBRIDGE • Trinity College MASt in Physics, Commendable Performance Lt. Charles H. Fiske III Harvard-Cambridge Scholar	Cambridge, UK
2014	HARVARD UNIVERSITY AB in Physics and Mathematics (Cum Laude, High Honors in Field) Dramatic Arts Secondary	Cambridge, MA

Research

2020	LEARNING LATENT GRAPH REPRESENTATIONS OF THE DANCING BODY Internship developing Graph Neural Networks to analyze choreography	Intel AI Lab
2017 - Present	GENERATIVE CHOREOGRAPHY WITH MACHINE LEARNING I lead an independent research group of 5 artists and scientists in generating and performing novel choreography based on 3D motion capture of my own movements. Sponsor: Yale Center for Collaborative Arts & Media	Yale
2016 - Present	ATLAS EXPERIMENT $VH, H \rightarrow \tau\tau$ Search Prof. Sarah Demers	CERN
2016 - 2018	ATLAS EXPERIMENT Tau Identification with Recurrent Neural Networks in the ATLAS Trigger Prof. Sarah Demers	CERN
2015 - 2016	MUZE EXPERIMENT Trigger & Data Acquisition Studies for the Muze Experiment Prof. Sarah Demers	Fermilab
2012	ATLAS EXPERIMENT Improving k-factor Estimations for NNLO $H \rightarrow b\bar{b}$ Interactions Prof. John Huth, Dr. David Lopez Mateos	CERN
2011	HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS Reconstructing the Baryon Acoustic Oscillatory Peak Dr. Daniel Eisenstein	Cambridge, MA

Publications

2020	Pettee et. al. Choreo-Graph: Learning Latent Graph Representations of the Dancing Body. (<i>Submitted</i>).
2019	Pettee et. al. Beyond Imitation: Generative and Variational Choreography via Machine Learning. <i>Proceedings of the 10th International Conference on Computational Creativity</i> . arXiv:1907.05297 . The ATLAS Collaboration (Co-writer & editor). Expected Performance of the ATLAS Detector at the High-Luminosity LHC. ATL-PHYS-PUB-2019-005 . Full list of papers with the ATLAS collaboration. ₁

Awards

2018	US LHC Users Association Lightning Round Talk Winner Women's Faculty Forum Seed Grant
2016	Winner, Windy City Physics Slam (PBS Chicago Interview Clip) Poster Award, <i>Trigger Studies for the Muze Experiment</i> , ICHEP
2015	Honorable Mention, NSF Graduate Research Fellowship Program Leigh Page Prize (for potential contributions to the field of physics), Yale University
2014	Harvard-Cambridge Scholarship Julia Shaffner Memorial Prize (Outstanding Woman in Science), Harvard University
2013	Finalist, The Harvard Innovation Lab President's Challenge 15 Most Interesting Seniors, <i>The Harvard Crimson</i>
2012	The International Student Drama Festival Judges' Award for Acting Harvard University Certificate of Distinction in Teaching The Caroline Isenberg and Elizabeth Cary Agassiz Fellowships
2011	Harvard Theater Award for Best Lead Actress in a Play

Talks

2020	RUN 3 TRIGGERS FOR HLEPTONS ANALYSES ATLAS Tau & HLeptons Workshop	Online
	CHOREO-GRAPH: LEARNING LATENT GRAPH REPRESENTATIONS OF THE DANCING BODY Invited Speaker at Kinetech Arts (San Francisco, CA)	Online
	BEYOND IMITATION: GENERATIVE CHOREOGRAPHY WITH AI Invited Speaker at Conference for Research on Choreographic Interfaces (CRCI)	Brown University
2019	EXPECTED ATLAS PERFORMANCE AT THE HL-LHC US ATLAS Workshop	UMass Amherst
	OVERVIEW OF TAU VS. JET IDENTIFICATION ATLAS Tau & HLeptons Workshop	Prague, Czech Republic
	BEYOND IMITATION: GENERATIVE CHOREOGRAPHY VIA MACHINE LEARNING International Conference on Computational Creativity (ICCC)	Charlotte, NC
2018	RNN TAU IDENTIFICATION WITHIN THE ATLAS HLT US LHC Users Association Meeting	Fermilab
	RNN TAU IDENTIFICATION IN THE ATLAS HLT ATLAS Machine Learning Workshop	CERN
	THE 2018 ATLAS TAU TRIGGER & COMBINED PERFORMANCE US ATLAS Workshop	Pittsburgh, PA
	TAU TRIGGER & CP PERFORMANCE AT HIGH μ ATLAS P&P Physics Plenary	CERN
	FTK & THE TAU TRIGGER ATLAS TDAQ Week	CERN

Posters

2020	RNN TAU IDENTIFICATION IN THE ATLAS HIGH-LEVEL TRIGGER ATLAS Trigger & Data Acquisition Week 2020	CERN
2019	GENERATIVE & VARIATIONAL CHOREOGRAPHY VIA MACHINE LEARNING Women in Machine Learning (WiML) at NeurIPS 2019	Vancouver, Canada
	MACHINE WOMAN: PRESERVATION, MEMORY, FORGETTING, AND AI Women's Faculty Forum at Yale	New Haven, CT
2017	PERFORMANCE OF THE ATLAS TAU TRIGGER IN RUN 2 Advanced Computing & Analysis Techniques in Physics Research (ACAT)	Seattle, WA
2016	TRIGGER STUDIES FOR THE MU2E EXPERIMENT International Conference on High Energy Physics (ICHEP)	Chicago, IL

Leadership & Service

2020	Women+ Art AI : Part of a global collective of women working at the intersection of art & AI Session Co-Convener, PyHEP 2020 (Conference for Python in High-Energy Physics)
2019 - Present	Reviewer for NeurIPS Physical Sciences Workshop
2019	Reviewer for Women in Machine Learning (WiML) Workshop
2017 - Present	HLeptons Trigger Liaison: Trigger Studies for the ATLAS $H \rightarrow \tau\tau$ Analysis Group

Teaching

TRAINING

2016	PHYSICS 530: Theory and Practice of Scientific Teaching for Physical Scientists	Yale University
2014	ASTRO 302: Scientists Teaching Science	Harvard University

YALE UNIVERSITY

2018	Physics 115: The Physics of Dance American Studies 349: Technologies for Movement Research
2017	Physics 171: University Physics for the Life Sciences Physics 115: The Physics of Dance
2016	Physics 205L: Modern Physical Measurement Physics 115: The Physics of Dance
2015	Physics 165L: General Physics Laboratory

HARVARD UNIVERSITY

2013	Math 110: Vector Space Methods for Differential Equations
2012 & 2013	Math 121: Linear Algebra and Applications

Writing

- 2018 [Theories of Everything](#), *Sightline Arts*
[Now or Never: The Case for a Larger Hadron Collider](#), *Yale Distilled Magazine*

Inclusion & Outreach Efforts

- 2020 Member of the American Physical Society's Inclusion, Diversity, and Equity Alliance (APS-IDEA)
- 2019 - Present Member of the Yale Physics Climate & Diversity Committee
→ Advocated for a department-wide discussion of discrimination in our community
→ Contributed to the design of our department's Code of Conduct
- 2018 - 2020 US LHC Users Association advocacy trip to Capitol Hill
→ Met with the offices of around 15 representatives from Congress each year to ask for their support for high-energy physics research and STEM funding in general
- 2017 - 2018 Speaker, *Science in the News*, delivering scientific talks to the New Haven public Girls' Science Investigations at Yale
- 2016 Winner, Windy City Physics Slam
Choreographer: *Form Factors*, a dance intervention with physicists at ICHEP
- 2015 - Present Yale Women in Physics Mentor

Arts

EXHIBITIONS

- 2020 [Mirror Exercise](#): an AI-generated duet with myself
→ Selected by the AI Transparency Institute & featured at the 2020 AI Governance Forum
→ Boston Cyberarts Gallery exhibition *Perceptions / Distortions* (cancelled due to COVID-19)
- 2019 [SIGMA](#): a short film of AI-generated choreography
→ AI Art Gallery @ NeurIPS, a premier AI conference

YALE UNIVERSITY

- 2020 Choreographer, *Elon Musk and the plan to Blow Up Mars the musical*
→ Yale Cabaret, dir. Liam Bellman-Sharpe
- Dancer, Coordinator, & Rehearsal Director, *Yale Dance Lab*
→ New work by choreographer Vicky Shick: "everywhere"
- 2019 Featured performer, *Learning Film (working title)*
→ Interviewed for a documentary by the Derek Jarman Lab, co-produced by Tilda Swinton
- Bill T. Jones/Arnie Zane Dance Company Intensive, *Yale Dance Theater*
→ Dancer in a restaging of *D-Man in the Waters*
- 2018 Featured performer, *Machine Woman*
→ An experiential short film documenting my AI-generated choreography research
- Paul Taylor Dance Company Intensive, *Yale Dance Theater*
→ Leading role as "The Hostess" in the first restaging of Taylor's *Party Mix* in four decades
- 2017 Choreographer: "La Mort du Chorégraphe", *A Different Drum Dance Company*

- Urban Bush Women Intensive, *Yale Dance Theater*
- 2016 Gaga Intensive with Saar Harari & Lee Sher, *Yale Dance Theater*
Choreographer: “Rang Cherries”, *A Different Drum Dance Company*
- UNIVERSITY OF CAMBRIDGE
- 2015 Actor, *Attempts on Her Life*, dir. Tania Clarke, Corpus Playroom
Dancer, *Evolution*, ADC Theatre
- HARVARD UNIVERSITY
- 2014 Director/Writer/Choreographer: [Symmetry Breaking](#)
→ My creative physics thesis: an experimental multimedia performance about the Higgs boson
President, *The Signet Society of Arts & Letters*
Choreographer-in-Residence, *Harvard Dance Center*
Dancer, *Paper Wing*, chor. Jill Johnson, Farkas Hall
- 2013 Arts@CERN Internship
Eurydice, *Antigonick*, dir. Ianthe Demos, American Repertory Theater Mainstage
Isabelle & Executive Producer, *The Edge of the Map*, dir. Calla Videt (Sightline Theater Company)
Dancer, *At Last*, Loeb Experimental Theater
Dancer, *On The Run*, Harvard Dance Center
- 2012 Vice-President & Mainstage Coordinator, *The Harvard-Radcliffe Dramatic Club*
→ 35+ productions as a performer, director, producer, designer, & choreographer
Lucy, *CryHurtFood*, Loeb Experimental Theater & Crucible Mainstage (Sheffield, UK)
Director: *for the purpose of catching ourselves in the act of being the most*
→ Set the Guinness World Record for the longest telephone conversation between two people
- 2011 Co-founder and collaborator, *The Harvard Generalist*
Drama & Dance Proctor, *Freshman Arts Program* (2011-2014)