

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	Cambridge, UK
2014	HARVARD UNIVERSITY AB in Physics and Mathematics (Cum Laude, High Honors in Field) Dramatic Arts Secondary	Cambridge, MA

Research

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

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.
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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, 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	Harvard University Certificate of Distinction in Teaching The Caroline Isenberg and Elizabeth Cary Agassiz Fellowships

Talks

2019	EXPECTED ATLAS PERFORMANCE AT THE HL-LHC US ATLAS Workshop	<i>UMass Amherst</i>
	OVERVIEW OF TAU VS. JET IDENTIFICATION ATLAS Tau & HLeptons Workshop	<i>Prague, Czech Republic</i>
	BEYOND IMITATION: GENERATIVE CHOREOGRAPHY VIA MACHINE LEARNING International Conference on Computational Creativity	<i>Charlotte, NC</i>
2018	RNN TAU IDENTIFICATION WITHIN THE ATLAS HLT US LHC Users Association Meeting	<i>Fermilab</i>
	RNN TAU IDENTIFICATION IN THE ATLAS HLT ATLAS Machine Learning Workshop	<i>CERN</i>
	THE 2018 ATLAS TAU TRIGGER & COMBINED PERFORMANCE US ATLAS Workshop	<i>Pittsburgh, PA</i>
	TAU TRIGGER & CP PERFORMANCE AT HIGH μ ATLAS P&P Physics Plenary	<i>CERN</i>
	FTK & THE TAU TRIGGER ATLAS TDAQ Week	<i>CERN</i>

Posters

2019	GENERATIVE & VARIATIONAL CHOREOGRAPHY VIA MACHINE LEARNING Women in Machine Learning (WiML) at NeurIPS 2019	<i>Vancouver, Canada</i>
	MACHINE WOMAN: PRESERVATION, MEMORY, FORGETTING, AND AI Women's Faculty Forum at Yale	<i>New Haven, CT</i>
2017	PERFORMANCE OF THE ATLAS TAU TRIGGER IN RUN 2 Advanced Computing & Analysis Techniques in Physics Research (ACAT)	<i>Seattle, WA</i>
2016	TRIGGER STUDIES FOR THE MUZE EXPERIMENT International Conference on High Energy Physics (ICHEP)	<i>Chicago, IL</i>

Teaching

TRAINING

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

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 , <i>Sightline Arts</i> Now or Never: The Case for a Larger Hadron Collider , <i>Yale Distilled Magazine</i>
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Service & Outreach

2018, 2019	US LHC Users Association advocacy trip to Capitol Hill → Met with the offices of 15 representatives from Congress to advocate for their support of high-energy physics research funding
2017 - 2018	Speaker, <i>Science in the News</i> , delivering scientific talks to the New Haven public Girls' Science Investigations at Yale
2016	Winner, Windy City Physics Slam Choreographer: <i>Form Factors</i> , a dance intervention with physicists at ICHEP
2015 - Present	Yale Women in Physics Mentor

Arts

YALE UNIVERSITY

2019	SIGMA , <i>AI Art Gallery @ NeurIPS 2019</i> → Short video installation of generated choreography at a premier AI conference
	Featured performer, <i>Learning Film (working title)</i> → Interviewed for a documentary by the Derek Jarman Lab, co-produced by Tilda Swinton
	Bill T. Jones/Arnie Zane Dance Company Intensive, <i>Yale Dance Theater</i> → Dancer in a restaging of <i>D-Man in the Waters</i>

- 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*
 → Ongoing Research in AI-generated choreography
 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*
- HARVARD UNIVERSITY
- 2014 Director/Writer/Choreographer: *Symmetry Breaking*
 → My creative physics thesis project: an experimental multimedia performance
 President, *The Signet Society of Arts & Letters*
 Choreographer-in-Residence, *Harvard Dance Center*
- 2013 Arts@CERN Internship
- 2012 The International Student Drama Festival Judges’ Award for Acting
 Vice-President & Mainstage Coordinator, *The Harvard-Radcliffe Dramatic Club*
 → 35+ productions as a performer, director, producer, designer, & choreographer
 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 Harvard Theater Award for Best Lead Actress in a Play
 Co-founder and collaborator, *The Harvard Generalist*
 Drama & Dance Proctor, *Freshman Arts Program* (2011-2014)