João Caldeira

5559 S Kimbark Ave, Chicago, IL 60637 • 773-633-3089
www.github.com/joaocaldeira • caldeira@fnal.gov

EXPERIENCE

Fermilab, IL, USA: *Postdoctoral Research Associate* Dec 2018 –
- Producing a comparison-guide of deep learning uncertainty quantification methods for physicists
- Developing algorithms for use of quantum computing in scientific tasks, namely classification problems in cosmology
- Implemented machine learning algorithms in large simulated as well as real-world datasets
- Gave 6 seminars summarizing my work both for lay and specialized audiences

University of Chicago, IL, USA: *Data Science for Social Good fellow* May 2018 – Aug 2018
- Built object detection pipeline to allow analysis of Jakarta traffic CCTV data
- Highlighted Paper Award at the NeurIPS 2018 AI for Social Good Workshop

Enrico Fermi Institute/University of Chicago, IL, USA: *Research Assistant* 2012–2018
- Implemented convolutional neural networks for delensing cosmic microwave background, achieving 50% less noise than traditional methods across wide range of scales
- Developed new duality techniques to generalize the concepts of mirror symmetry and quantum cohomology to a larger class of theories and geometric spaces

University of Chicago, IL, USA: *Teaching Assistant* 2011–2018
- Developed python package for Monte Carlo simulation of gamma ray interaction with matter now in use by undergraduate students in Advanced Experimental Physics class
- Taught discussion and lab sections in eight courses for undergraduate physics majors

EDUCATION

University of Chicago, IL, USA: PhD in Physics Oct 2018
- Advisor: Savdeep Sethi

Imperial College London, UK: MSc in Quantum Fields and Fundamental Forces Sep 2010
- Advisor: Carl Bender. Graduated with distinction. GPA: 96%

Instituto Superior Técnico, Portugal: BSc in Engineering Physics Jul 2009
- GPA: 19/20 (Class rank: 1st in 50)

COMPETITIONS

Advent of Code 2019: 118 points.

Citadel Data Open
- Finalist (2017): top 80 in 10,000+ participants. Analyzed test and demographic data on all US school districts to create an Educational Quality Index with policy implications

International Mathematical Olympiad (IMO)
- Bronze medal (2006), participant (2005): top 6 in national selection for two years.

Iberoamerican Physics Olympiad: Gold medal (2006).

SKILLS

Programming: python (numpy, scipy, sklearn, pandas, keras, tensorflow, django), C++, C, bash, git
Data analysis: Machine learning, Monte Carlo, convolutional neural networks, Bayesian statistics
Physics: Quantum computing, quantum field theory, string theory, chiral gauge theories
Others: Member of a science improv ensemble with monthly shows since Oct 2018