

# Jared Coughlin

PH.D. · THEORETICAL COSMOLOGIST

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## Appointments

### University of Illinois - National Center for Supercomputing Applications

Urbana, IL

POSTDOCTORAL RESEARCH ASSOCIATE

Dec 2018 -

- Developer: yt project
- Supervisors: Matthew Turk and Nathan Goldbaum

## Education

### University of Notre Dame

Notre Dame, IN

PH.D. PHYSICS

Jun 2011 - Jan 2019

- Thesis: "Time-Dependent Dark Energy and The Flux Power Spectrum of the Lyman  $\alpha$  Forest"
- Advisors: Profs. Grant Mathews and Lara Arielle Phillips

### Villanova University

Villanova, PA

B.S. ASTROPHYSICS

Aug 2007 - May 2011

- GPA: 3.86
- Magna Cum Laude

## CONTINUING EDUCATION

### DeepLearning.AI - coursera.org

Champaign, IL

CERTIFICATE

Mar 2021

- [Neural Networks and Deep Learning](#)

### DeepLearning.AI - coursera.org

Champaign, IL

CERTIFICATE

Mar 2021

- [Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization](#)

### DeepLearning.AI - coursera.org

Champaign, IL

CERTIFICATE

Apr 2021

- [Structuring Machine Learning Projects](#)

### DeepLearning.AI - coursera.org

Champaign, IL

CERTIFICATE

May 2021

- [Convolutional Neural Networks](#)

### DeepLearning.AI - coursera.org

Champaign, IL

CERTIFICATE

May 2021

- [Sequence Models](#)

### University of Alberta - coursera.org

Champaign, IL

CERTIFICATE

Jun 2021

- [Fundamentals of Reinforcement Learning](#)

## Research

### University of Notre Dame

Notre Dame, IN

GRADUATE STUDENT RESEARCHER

2011 - 2018

- Effects of time-dependent dark energy on the Lyman  $\alpha$  Forest
- Properties and evolution of baryons in the cosmic web using cosmological simulations
- Studied supersymmetric compliant quintessence

## Harvard-Smithsonian Center for Astrophysics

Cambridge, MA

REU RESEARCHER

2010

- Numerical study of exoplanet mutual events for the Kepler Mission
- Advisor: Darin Ragozzine

## Villanova University

Villanova, PA

UNDERGRADUATE STUDENT RESEARCHER

2008 - 2011

- Analysis of x-ray observations of the solar twin 18 Scorpii
- Advisor: Edward Guinan

## Teaching

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### University of Notre Dame

Notre Dame, IN

DIGITAL VISUALIZATION THEATER TA

Aug 2013 - Nov 2018

- Piloted and gave planetarium shows for both students and the general public
- Created content on the cosmic web and general relativity

### University of Notre Dame

Notre Dame, IN

PHYSICS TA

Aug 2011 - Jul 2013

- In charge of help sessions for introductory physics
- Exam grading
- In charge of organizing and running labs for introductory physics

### Villanova University

Villanova, PA

PUBLIC OBSERVATORY ATTENDANT

Sep 2007 - May 2011

- Operated public observatory on campus
- Gave viewing tours to both students and the general public

## Publications

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### FIRST AUTHOR (1)

**Probing Time-Dependent Dark Energy with the Flux Power Spectrum of the Ly $\alpha$  Forest.** Jared W. Coughlin, Grant J. Mathews, Lara Arielle Phillips, Ali P. Snedden, In-Saeng Suh. *ApJ*, 874: 11, 2019.

### CO-AUTHOR (5)

**3-3-1 Self Interacting Dark Matter and the Galaxy Core-Cusp problem.** Nguyen Quynh Lan, Grant J. Mathews, Lara Arielle Phillips, Miguel A. Correa, In-Saeng Suh, Jared W. Coughlin. *arXiv:2012.02093*.

**Star Formation and Gas Phase History of the Cosmic Web.** A. Snedden, J. Coughlin, L.A. Phillips, G. Mathews, I.S. Suh. *MNRAS*, 455: 2804, 2016.

**A New Multi-Scale Structure Finding Algorithm to Identify Cosmological Structure.** A. Snedden, L.A. Phillips, G. Mathews, J. Coughlin, I.S. Suh, A. Bhattacharya. *Journal of Computational Physics*, 299: 92, 2015.

**Origin and Evolution of Structure and Nucleosynthesis for Galaxies in the Local Group.** G. Mathews, A. Snedden, L.A. Phillips, I.S. Suh, J. Coughlin, A. Bhattacharya, X. Zhao, N.O. Lan. *Modern Physics Letters A*, 29: 14, 2014.

**Kepler Eclipsing Binary Stars. II. 2165 Eclipsing Binaries in the Second Data Release.** Robert W. Slawson, Andrej Prsa, William F. Welsh, Jerome A. Orosz, Michael Rucker, Natalie M. Batalha, Lorraine R. Doyle, Scott G. Engle, Kyle Conroy, Jared Coughlin et al. *The Astronomical Journal* 142.5 (2011): 160.

## Oral Presentations

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### University of Notre Dame

Notre Dame, IN

ASTROPHYSICS SEMINAR

2018

- Time-Dependent Dark Energy and the Flux Power Spectrum of the Lyman  $\alpha$  Forest

### University of Notre Dame

Notre Dame, IN

ASTROPHYSICS SEMINAR

2018

- Cosmic Acceleration and Large-Scale Structure

## University of Notre Dame

OUR UNIVERSE REVEALED

- To Infinity and Beyond: An Exploration of Travel Between the Stars

Notre Dame, IN

2018

## University of Notre Dame

ASTRONOMY SKILLS LUNCH TALK

- Debugging and Organizing Your Code

Notre Dame, IN

2017

## University of Notre Dame

OUR UNIVERSE REVEALED

- The Great Silence: An Exploration of the Fermi Paradox

Notre Dame, IN

2017

## Villanova University

ASTROPHYSICS COLLOQUIUM

- Cosmic Acceleration and Large-Scale Structure

Villanova, PA

2017

## Poster Presentations

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### American Astronomical Society Meeting #217

GENERAL POSTER SESSION

- Multi-Transiting Systems and Exoplanet Mutual Events

Seattle, WA

2011

### American Astronomical Society Meeting #215

GENERAL POSTER SESSION

- The Night Time Sun: X-Ray Observations of the Solar Twin 18 Scorpii

Washington, D.C.

2010

## Skills

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**Languages** Python, C, C++, Julia, Bash

**Frameworks and Libraries** Numpy, Scipy, MPI, OpenMP, Pytorch, Tensorflow, Pandas

**Database** SQLite3

**Other technologies** Linux/Unix, Git, Mercurial

## Honors and Awards

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2011 **Winner**, Fr. Edward F. Jenkins, O.S.A. Medallion Award

2010 **Winner**, Fr. Edward F. Jenkins, O.S.A. Scholarship Award

2010 **Honorable Mention**, Barry M. Goldwater Scholarship

Villanova, PA

Villanova, PA

Villanova, PA