

# GABRIEL P. LYNCH

## EDUCATION

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**The University of Chicago** 2014-2018  
Bachelor of Arts in Physics with Honors June 2018  
Bachelor of Arts in Mathematics June 2018  
**Thesis (Honors):** “A holographic look at topologically disconnected black hole remnants”  
*Advisor: Prof. Carlos Wagner*

## RESEARCH EXPERIENCE

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**Cosmological Physics and Advanced Computation Group** September 2018 - Present  
*Research Aide* Argonne National Laboratory

- Developed a distributed spectral Schrödinger-Poisson solver for cosmological simulations of Bose-Einstein condensate dark matter, to be run on high performance computing machines at Argonne.
- Studied the formation of ultra-diffuse dwarf galaxies in extreme-scale cosmological n-body codes.

**ATLAS Group** June 2016 - September 2016  
*Department of Energy SULI Intern* Argonne National Laboratory

- Analyzed and determined event selection criteria of simulated ATLAS detector data using the ROOT data analysis framework.
- Simulated particle collision data subject to various constraints using MadGraph5 and Pythia6.
- Wrote a project paper and presented research to others in the Argonne ATLAS group.

## TEACHING

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**Junior Tutor** October 2016 - June 2018  
*Department of Mathematics* University of Chicago

- Held tutorial sessions twice a week for students in introductory calculus classes in order to review and reiterate class lessons.
- Provided student feedback in the form of graded quizzes and problem sets.

## AWARDS AND HONORS

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**Black Hole Initiative essay winner** of third prize December 2018  
**Departmental Honors** for Undergraduate thesis in physics June 2018  
**Argonne Scholarship** with grant of \$53,000 per year 2014-2018  
**Dean’s List** for high academic achievement at the University of Chicago 2014-2016, 2017-2018

## PRESENTATIONS

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**“High-resolution cosmological simulations of fuzzy dark matter”** April 2020  
*APS April meeting (canceled)* APS

**“Simulating dark matter with the Schrödinger equation”** December 2019  
*Young Scientist Symposium Series* Argonne National Laboratory

**“Black hole remnants and topology changes”** June 2018  
*Thesis presentation* University of Chicago

## MEMBERSHIPS AND COMMITTEES

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Young Scientist Symposium Series organizing committee

2019-2020

Large Synoptic Survey Telescope - Dark Energy Science Collaboration (LSST-DESC)

## SELECTED COURSEWORK AND SKILLS

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### Physics

PHYS 364: General Relativity

PHYS 243: Advanced Quantum Mechanics

PHYS 250: Computational Physics

### Mathematics

MATH 263: Introduction to Algebraic Topology

MATH 274: Intro. to Differentiable Manifolds

**Computer Languages**      C++   Python   Fortran 77/90   Mathematica

**Computer Skills**      Distributed computing   MPI   Git   ROOT   Linux