

# Alex Pizzuto

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## Education

- 2017–present **(Expected) PhD, Physics**, *University of Wisconsin-Madison*.  
Advisor: Justin Vandenbroucke
- 2017–2019 **Master's of Arts, Physics**, *University of Wisconsin-Madison*.  
Minor: Computational methods in particle astrophysics
- 2013–2017 **Bachelor's of Science**, *Loyola University Chicago*, summa cum laude.  
Majors: Physics, Mathematics, Theoretical Physics and Applied Mathematics

## Research Overview

- 2017–present **Realtime Neutrino Astronomy**: Developed pipelines to process low-latency data transferred via satellite to search for astrophysical neutrino sources
- Particle Astrophysics with IceCube**: Implemented maximum likelihood analyses to search for neutrino sources from a variety of astrophysical source classes
- The Distributed Electronic Cosmic-ray Observatory**: Maintained smartphone app that detects cosmic rays with cell phone camera image sensors
- 2015–2017 **Modified theories of gravity**: Explored analytic expressions of scalar fields near maximally rotating black holes in dynamical Chern-Simons gravity

## Awards and Fellowships

- 2021 IceCube Impact Award: *for key contributions to the improvement of the fast response analysis and its exemplary documentation*
- 2020 Charles Elwood Mendenhall Research Award
- 2020 IceCube Diversity, Equity, and Inclusion travel grant (travel cancelled due to COVID-19)
- 2019 NSF Graduate Research Fellowship Program Honorable Mention
- 2018 Teaching Assistant Rookie of the Year
- 2017 Barshall Incoming Graduate Fellowship
- 2017 Horan Award for Excellent Graduating Senior in Physics
- 2015–2017 Mulcahy Research Fellow
- 2013–2017 Full Tuition Presidential Scholarship
- 2013–2017 Member of Loyola Interdisciplinary Honors Program
- 2016 Lee Teng Fellowship in Accelerator Physics
- 2014, 2016 Father Gerst Memorial Award for Excellence in Physics

## Leadership, Public Outreach, and Community Involvement

- 2020–present Astrobites contributing author  
For a list of articles, see <https://astrobites.org/author/apizzuto/>
- 2020–present WIPAC High School Internship volunteer

- 2019–present Organizer of weekly WIPAC graduate student seminar series
- 2018–present Volunteer at local community science outreach events (approx. 5 per year)
  - 2021 IceCube Bootcamp Organizer
  - 2020 SkypeAScientist Participant
- 2019–2020 Physics graduate student peer mentor

## Teaching Experience

- 2020 **University of Wisconsin-Madison**, *Grader*.  
Physics 772: Particle Astrophysics
- 2017 **University of Wisconsin-Madison**, *Teaching Assistant*.  
Physics 202: Electricity & Magnetism for Engineers
- 2014–2017 **Loyola University Chicago**, *Teaching Assistant*.  
Physics 111 (111L): Introductory Mechanics (Lab), Physics 112 (112L): Introductory Electricity & Magnetism (Lab), Physics 301: Mathematical Methods of Physics
- 2016 **Loyola University Chicago**, *Grader*.  
Physics 351: Electricity & Magnetism

## Mentoring Experience

- 2018–present Runze Li, UW-Madison undergraduate student: *Effects of the geomagnetic field on cosmic-ray muons in ice; Simulation studies of the Distributed Electronic Cosmic-ray Observatory*
- 2019–2020 Blake Gallay, visiting Cornell undergraduate student: *Distributed Electronic Cosmic-ray Observatory updates and noise studies*

## Invited Talks

- April 2021 *Multi-messenger astrophysics with high-energy neutrinos*, Michigan State University Astronomy Seminar
- June 2020 *Frequentist and Bayesian Statistics*, IceCube Bootcamp 2020 (virtual, [slides](#))
- February 2020 *How to read an academic article*, UW-Madison Physics professional development seminar series ([slides](#))
- November 2019 *Cosmic messengers from the extreme universe*, Loyola University Chicago Physics department colloquium
- June 2019 *Introduction to Machine Learning in IceCube*, IceCube Bootcamp 2019, Madison, WI ([slides](#))

## Conferences, Meetings, and Workshops

- April 2021 *Realtime follow-up of astrophysical transients with the IceCube Neutrino Observatory*, American Physical Society April Meeting (parallel talk, virtual)
- July 2020 *Constraining Astrophysical interpretations of ANITA events with IceCube*, Neutrino2020 ([poster](#), virtual)
- June 2020 *Search for sub-TeV neutrinos from novae*, American Astronomical Society Meeting 236 (parallel talk, virtual)
- April 2020 *Constraints on astrophysical interpretations of anomalous ANITA events with IceCube*, American Physical Society April Meeting (parallel talk, virtual)

- September 2019 *IceCube Fast Response Analysis: Results and Future Outlook*, IceCube Fall Collaboration Meeting, Chiba, Japan (plenary talk)
- July 2019 *A search for counterparts to ANITA neutrino candidates with IceCube*, International Cosmic-ray Conference, Madison, WI (parallel talk)
- July 2019 *Searches for neutrinos from fast radio bursts with IceCube*, International Cosmic-ray Conference, Madison WI (poster)
- July 2019 *Particle Identification in Smartphone Camera Images Using the Distributed Electronic Cosmic-ray Observatory*, International Cosmic-ray Conference, Madison WI (poster)
- May 2019 *Joint interpretation of anomalous ANITA events*, IceCube Spring Collaboration Meeting, Madison, WI (plenary talk)

## Peer-Reviewed Publications

### Major Contributions or contributing author

ICECUBE collaboration, *Follow-up of Astrophysical Transients in Real Time with the IceCube Neutrino Observatory*, *Astrophys. J.* **910** (2021) 4 [2012.04577]

ICECUBE collaboration, *A search for IceCube events in the direction of ANITA neutrino candidates*, *Astrophys. J.* **892** (2020) 1 [2001.01737]

I. Safa, A. Pizzuto, C. A. Argüelles, F. Halzen, R. Hussain, A. Kheirandish et al., *Observing EeV neutrinos through the Earth: GZK and the anomalous ANITA events*, *JCAP* **2001** (2020) 012 [1909.10487]


### Significant contributions

C. F. Tung, T. Glauch, M. Larson, A. Pizzuto, R. Reimann and I. Taboada, *Firesong: A python package to simulate populations of extragalactic neutrino sources*, *Journal of Open Source Software* **6** (2021) 3194

ICECUBE collaboration, *IceCube Search for Neutrinos Coincident with Compact Binary Mergers from LIGO-Virgo's First Gravitational-wave Transient Catalog*, *Astrophys. J. Lett.* **898** (2020) L10 [2004.02910]

ICECUBE collaboration, *A Search for MeV to TeV Neutrinos from Fast Radio Bursts with IceCube*, *Astrophys. J.* **890** (2019) [1908.09997]

### Complete list of publications

Contributing author on all IceCube Collaboration papers since June 2018, for a complete list of publications, see 

## Conference Proceedings

A. Pizzuto, A. Barbano, T. Montaruli and J. Vandenbroucke, *A search for IceCube events in the direction of ANITA neutrino candidates*, in *36th International Cosmic Ray Conference (ICRC 2019) Madison, Wisconsin, USA, July 24-August 1, 2019*, 2019, 1908.08060

A. Kheirandish, A. Pizzuto and J. Vandenbroucke, *Searches for neutrinos from fast radio bursts with IceCube*, in *ICRC 2019 Madison, Wisconsin, USA, July 24-August 1, 2019*, 2019, 1909.00078

A. Pizzuto, J. Vandenbroucke, B. Gallay, M. Meehan, J. Bourbeau, J. Peacock et al., *Particle Identification in Smartphone Camera Images Using the Distributed Electronic Cosmic-ray Observatory*, in *ICRC 2019 Madison, Wisconsin, USA, July 24-August 1, 2019*, 2019

J. Vandenbroucke, A. Pizzuto and K. Meagher, *IceCube as a Multi-messenger Follow-up Observatory for Astrophysical Transients*, in *ICRC 2019 Madison, Wisconsin, USA, July 24-August 1, 2019*, 2019, [1909.05834](#)