

Department of Physics
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RESEARCH INTERESTS

- High-energy astrophysics (particle acceleration, transport and radiation processes)
- Multimessenger astrophysics (gamma rays, neutrinos and cosmic rays from extreme sources)

EDUCATION

Spring 2022 (Expected)	Ph.D. in Physics, Pennsylvania State University Supervised by Prof. Péter Mészáros and Prof. Kohta Murase Thesis: <i>High-Energy Neutrino and Electromagnetic Emissions from Galaxy and Super Massive Black Hole Mergers</i>
2016	B.Sc. in Astronomy, Nanjing University, China Supervised by Prof. Xiangyu Wang and Prof. Fayin Wang Undergraduate Thesis: <i>The origin of high-energy astrophysical neutrinos</i>

EMPLOYMENT HISTORY

2018 -	Research Assistant , Dept. of Physics, Penn State
2016 -	Teaching Assistant , Dept. of Physics, Penn State
Summer 2015	REU Intern , Dept. of Astronomy and Astrophysics, Penn State

HONORS & AWARDS

2021	W. Donald Miller Graduate Fellowship , Pennsylvania State University
2021, 20, 19	David C. Duncan Graduate Fellowship , Pennsylvania State University
2018	APS Graduate Student Travel Grant , American Physical Society
2017	Homer F. Braddock Scholarship , Pennsylvania State University
2016	School of Astronomy and Space Science Dean's Scholarship , Nanjing University
2016	Outstanding Thesis Award , Nanjing University
2015	REU Intern Travel Grant (host institution: Penn State), Nanjing University

PUBLICATIONS

Journal articles (first-author: 6)

- [7] **Yuan, C.**, Murase, K., Zhang, B. T., Kimura, S. S. & Mészáros, P. (2021) "Post-Merger Jets from Supermassive Black Hole Coalescences as Electromagnetic Counterparts of Gravitational Wave Emission", *ApJL*, 911 L15, doi: [10.3847/2041-8213/abee24](https://doi.org/10.3847/2041-8213/abee24)
- [6] Zhang, T. B., Murase, K., **Yuan, C.**, Kimura, S. S. & Mészáros, P. (2020) "External Inverse-Compton Emission Associated with Extended and Plateau Emission of Short Gamma-Ray Bursts: Application to GRB 160821B", *ApJL* 908 L36, doi: [10.3847/2041-8213/abe0b0](https://doi.org/10.3847/2041-8213/abe0b0)

- [5] **Yuan, C.**, Murase, K., Kimura, S. & Mészáros, P. (2020) “High-energy neutrino emission subsequent to gravitational wave radiation from supermassive black hole mergers”, *Phys. Rev. D* 102, 083013. doi: [10.1103/PhysRevD.102.083013](https://doi.org/10.1103/PhysRevD.102.083013)
- [4] **Yuan, C.**, Murase, K. & Mészáros, P. (2020) “Complementarity of Stacking and Multiplet Constraints on the Blazar Contribution to the Cumulative High-Energy Neutrino Intensity”, *ApJ*, 890:1. doi: [10.3847/1538-4357/ab65ea](https://doi.org/10.3847/1538-4357/ab65ea)
- [3] **Yuan, C.**, Murase, K. & Mészáros, P. (2019) “Secondary Radio and X-ray Emissions from Galaxy Mergers”, *ApJ*, 878:76. doi: [10.3847/1538-4357/ab1f06](https://doi.org/10.3847/1538-4357/ab1f06)
- [2] **Yuan, C.**, Mészáros, P., Murase K. & Jeong, D. (2018) “Cumulative Neutrino and Gamma-Ray Backgrounds from Halo and Galaxy Mergers”, *ApJ*, 857:50. doi: [10.3847/1538-4357/aab774](https://doi.org/10.3847/1538-4357/aab774)
- [1] **Yuan, C.** & Wang, F. (2015) “Cosmological Test Using Strong Gravitational Lensing Systems”, *MNRAS*, 452:3. doi: [10.1093/mnras/stv1444](https://doi.org/10.1093/mnras/stv1444)

Conference proceedings and other articles

- [2] **Yuan, C.**, Mészáros, P., Murase K. & Jeong, D. (2018) “Cumulative Neutrino and Gamma-Ray Backgrounds from Halo and Galaxy Mergers”, in *APS April meeting: U17.004*. [Talk abstract](#)
- [1] **Yuan, C.**, Murase K. & Mészáros, P. (2019) “A Multi-Messenger Picture of Galaxy Mergers: Neutrinos and Electromagnetic Emissions”, (*ICRC2019*) 1041. [Proceedings of Science](#)

CONFERENCES AND SCIENTIFIC TALKS

07/2021	Contributed talk: European Physical Society Conference on High Energy Physics (EPS21-HEP, virtual)
04/2021	Contributed talk: APS April meeting (virtual)
02/2021	Lunch talk: Institute for Gravitation and the Cosmos (IGC), Penn State (virtual)
10/2020	Invited talk: CCAPP AstroParticle Lunch, Ohio State University (virtual)
10/2020	Invited seminar: Astronomical seminar, Tohoku University, Japan (virtual)
09/2020	Lunch talk: Dept. of Astronomy & Astrophysics, Penn State University (virtual)
08/2020	Invited talk: Time-Domain High-Energy Messenger Astrophysics Workshop, University of Kyoto, Japan (virtual)
07/2019	Poster: 36th International Cosmic Ray Conference (ICRC), Madison, WI
06/2019	Contributed talk: IGC@25: Multimessenger Universe Workshop, State College, PA
05/2019	Invited seminar: Astronomy seminar, Nanjing University, China
04/2018	Contributed talk: APS April meeting, Columbus, OH
08/2015	Lunch talk: Dept. of Astronomy & Astrophysics, Penn State University

CODE DEVELOPMENT

Astrophysical Multimessenger Emission Synthesize (AMES)

A time-dependent numerical code for the production and propagation of high-energy cosmic rays, neutrinos, and gamma-rays for various astrophysical environments

- Developed the code for photo-meson/photo-hadronic interaction cross sections and cosmic $\gamma\gamma$ interactions.

PROGRAMMING SKILLS

- Extensive experience in using **CRpropa**, an astrophysical simulation code for the propagation of ultra-high-energy particles.
- Programming languages: C++, Python, Mathematica and Fortran

TEACHING EXPERIENCE

2021 F	T.A. PHYS 561: Quantum Mechanics
2021 S	T.A. PHYS 400: Electrodynamics
2020 F	T.A. PHYS/MATH 479: Special and General Relativity
2018 S, 2019, 2020 S	Lab. T.A. PHYS 250: Introductory Physics
2018 F	Office hour assistant PHYS 525: Methods of Theoretical Physics
2016 F - 2017 F	Lab. T.A. PHYS 212: Electromagnetism

OUTREACH

Jul 2017,18,19	AstroFest - A Tour of Universe, Penn State
May 2018	K-12 Educators: Bring Cutting-Edge STEM Research into your Classroom, Penn State

REFERENCES

- Dr. Péter Mészáros** (nnp@psu.edu)
 Eberly Chair Professor, Astronomy & Astrophysics and Physics
 Pennsylvania State University, USA
- Dr. Kohta Murase** (murase@psu.edu)
 Associate Professor, Physics and Astronomy & Astrophysics
 Pennsylvania State University, USA
- Dr. Dafne Guetta** (dafneguetta@braude.ac.il)
 Professor of Physics, ORT Braude College, Israel
- Dr. Donghui Jeong** (djeong@psu.edu)
 Associate Professor, Astronomy & Astrophysics
 Pennsylvania State University, USA
- Dr. Xiangyu Wang** (xywang@nju.edu.cn)
 Professor, Astronomy & Space Science, Nanjing University, China