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## RESEARCH INTERESTS

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

## EDUCATION

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| Expected 2021 | Ph.D. in Physics, Pennsylvania State University<br>Supervised by Prof. Péter Mészáros and Prof. Kohta Murase<br>Thesis: <i>High-Energy Neutrino and Electromagnetic Emissions from Galaxy and Super Massive Black Hole Mergers</i> |
| 2016          | B.Sc. in Astronomy and Space Science, Nanjing University, China<br>Supervised by Prof. Xiangyu Wang and Prof. Fayin Wang<br>Undergraduate Thesis: <i>The origin of high-energy astrophysical neutrinos</i>                         |

## EMPLOYMENT HISTORY

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

## HONORS & AWARDS

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| 2020, 2019 | David C. Duncan Graduate Fellowship, Penn State                              |
| 2018       | APS Graduate Student Travel Grant, American Physical Society                 |
| 2017       | Homer F. Braddock Scholarship, Penn State                                    |
| 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

- [7] Zhang, T. B., Murase, K., **Yuan, C.**, Kimura, S. & Mészáros, P. “External Inverse-Compton Emission Associated with Extended and Plateau Emission of Short Gamma-Ray Bursts: Application to GRB 160821B”, *Submitted to ApJL*, [arXiv:2012.09143](https://arxiv.org/abs/2012.09143)
- [6] **Yuan, C.**, Murase, K., Kimura, S. & Mészáros, P. “Post-merger electromagnetic counterparts of supermassive black hole coalescences”, *submitted to ApJ Letters*

- \*[5] **Yuan, C.**, Murase, K., Kimura, S. & Mészáros, P. “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

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Oct 2020	<b>Invited talk:</b> High-energy neutrino and electromagnetic emissions from SMBH mergers. <i>CCAPP AstroParticle Lunch</i> , Ohio State University
Oct 2020	<b>Talk:</b> Galaxy and SMBH mergers in the era of multi-messenger astrophysics. <i>Astronomical seminar</i> , Tohoku University, Japan
Sep 2020	<b>Lunch talk:</b> High-energy neutrino emission from SMBH mergers. Dept. of Astronomy & Astrophysics, Penn State
Aug 2020	<b>Invited talk:</b> High-energy neutrino emission subsequent to GW radiation from SMBH mergers. <i>Time-Domain High-Energy Messenger Astrophysics Workshop</i> , University of Kyoto, Japan
Jul 2019	<b>Poster:</b> A Multi-Messenger Picture of Galaxy Merger. <i>36th International Cosmic Ray Conference (ICRC)</i> , Madison, WI
Jun 2019	<b>Talk:</b> A Multi-Messenger Picture of Galaxy Mergers: Neutrinos and Electromagnetic Emissions. <i>IGC@25: Multimessenger Universe Workshop</i> , State College, PA
May 2019	<b>Invited talk:</b> Galaxy and halo mergers in the era of multi-messenger astronomy. <i>Astronomy seminar</i> , Nanjing University, China
Apr 2018	<b>Talk:</b> Cumulative Neutrino and Gamma-Ray Backgrounds from Halo and Galaxy Mergers. <i>APS April meeting</i> , Columbus, OH

- Aug 2015      **Lunch talk:** Monte Carlo simulations of electron-photon interactions with pair formation. Dept. of Astronomy & Astrophysics, Penn State
- May 2015      **Talk:** Cosmological test using strong gravitational lensing systems. *Cosmology and Galaxy Workshop*, Yangzhou, China

## CODE DEVELOPMENT

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### **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

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- 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

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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

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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

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**Dr. Péter Mészáros** ([nnp@psu.edu](mailto:nnp@psu.edu))

Eberly Chair Professor, Astronomy & Astrophysics and Physics, Penn State

**Dr. Kohta Murase** ([murase@psu.edu](mailto:murase@psu.edu))

Assistant Professor, Physics and Astronomy & Astrophysics, Penn State

**Dr. Donghui Jeong** ([djeong@psu.edu](mailto:djeong@psu.edu))

Associate Professor, Astronomy & Astrophysics, Penn State

**Dr. Xiangyu Wang** ([xywang@nju.edu.cn](mailto:xywang@nju.edu.cn))

Professor, Astronomy & Space Science, Nanjing University, China