

DESY Postdoctoral Fellow  
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## Appointments

2022 -	<b>Postdoctoral Fellow</b> , Deutsches Elektronen-Synchrotron DESY, Germany
2018 - 2022	<b>Research Assistant</b> , Dept. of Physics, Penn State, USA
2016 - 2022	<b>Teaching Assistant</b> , Dept. of Physics, Penn State, USA
Summer 2015	<b>REU Intern</b> , Dept. of Astronomy and Astrophysics, Penn State, USA

## Education

08/2022	<b>Ph.D. in Physics, Pennsylvania State University, USA</b> Supervised by Prof. Péter Mészáros and Prof. Kohta Murase Thesis: <i>Neutrino and Electromagnetic Counterparts of Galaxy and Black Hole Mergers</i>
06/2016	<b>B.Sc. in Astronomy, Nanjing University, China</b>

## Research Interests

- Astroparticle physics (CR acceleration, transport and radiation processes): theoretical & numerical
- Multimessenger astrophysics: gamma rays, neutrinos and cosmic rays from compact objects (e.g., GRBs, Kilonovae, and FRBs), TDEs, AGNs, and SMBH mergers

## Fellowships & Awards

2024	<b>DAAD (German Academic Exchange Service) Award</b> , as a junior researcher w. Dr. Walter Winter & Dr. Maria Petropoulou
2023, 2024	<b>DESY Postdoctoral Research Award (x2)</b> , DESY
2021-2022	<b>W. Donald Miller Graduate Fellowship (x2)</b> , Pennsylvania State University
2019-2022	<b>David C. Duncan Graduate Fellowship (x4)</b> , Pennsylvania State University
2018	<b>APS Graduate Student Travel Grant</b> , American Physical Society
2017	<b>Homer F. Braddock Scholarship</b> , Pennsylvania State University
2016	<b>School of Astronomy and Space Science Dean's Scholarship</b> , Nanjing Univ.
2016	<b>Merit Student</b> , Education Department of Jiangsu Province, China
2015	<b>REU Intern Travel Grant</b> (host institution: Penn State), Nanjing University
2015	<b>Duxia Scholarship</b> , Nanjing University

## Conferences and Scientific Talks

20 invited seminars and colloquia; 10 invited conference talks and lectures; 11 contributed conference talks and posters.

A full list is available at [Talks and Events](#)

## Selected recent talks

08/2025	Contributed talk, ICRC2025, Geneva, Switzerland
03/2025	Poster, 2nd LHAASO Symposium, Hong Kong, China
03/2025	Invited talk, Institute of High Energy Physics, Beijing, China
02/2025	Invited talk, Workshop on Numerical Multi-Messenger Modeling, Zeuthen, Germany
12/2024	Invited talk, DESY "Matter and the Universe" Days, Hamburg, Germany
11/2024	Invited seminar, University of Athens, Greece
09/2024	Invited talk, Roma International Conference on AstroParticle Physics (RICAP-24), Italy
09/2024	Invited colloquium, NCfA Astrophysics Forum, UNLV, USA
08/2024	Talk, TeVPA 2024, Chicago, USA
02/2024	Invited talk, Paris Numerical Lepto-Hadronic Modeling Workshop
09/2023	Talk, TeVPA 2023, Napoli, Italy
08/2023	Invited talk, Panelist of HE Transients, NEMMA Workshop, Penn State University, USA

## Software

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### Astrophysical Multi-Messenger Modeling (AM<sup>3</sup>)

*An open-source tool for time-dependent lepto-hadronic modelling of astrophysical sources*

- **Documentation** - <https://am3.readthedocs.io/>
- **Developers:** Marc Klinger, Annika Rudolph, Xavier Rodrigues, Chengchao Yuan, Gaëtan Fichet de Clairfontaine, Anatoli Fedynitch, Walter Winter, Martin Pohl, Shan Gao
- **Contribution:** core developer; radiating blob expansion implementation; TDE examples; code tests; C++ documentation.

## Programming Skills

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- Programming languages: C++, Python, Mathematica
- Extensive experience in using AM<sup>3</sup> and CRpropa

## Mentoring

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### PhD Students

2023 - **Karlijn Kruiswijk**, Université catholique de Louvain '22, "GeV neutrinos from GRBs", co-mentored with Dr. Walter Winter and Prof. Gwenhaël de Wasseige

### Master and Undergraduate Students

2024 - **Andre Neubauer**, Humboldt-Universität zu Berlin (MSc, '23)  
2023 **Federico Testagrossa**, University of Padova (MSc, '22), DESY Summer School  
2023 **David Raudales**, National Autonomous University of Honduras (BSc, '20), DESY Summer School

## Teaching Experience

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### Oxford-Berlin Neutrino Physics Lecturer (Berlin, Germany, 2024)

- Lecture Course on Neutrino Physics between Oxford University and Humboldt University Berlin
- Gave a lecture on time-dependent multi-messenger modeling using AM<sup>3</sup> software

## DESY Summer School Lecturer (Zeuthen, Germany, 2023)

DESY Summer School on Astroparticle Physics for Undergraduate and Master Students

- Gave a lecture on the physics of GRBs and on the radiation processes in astroparticle physics
- Guided students to complete the analytical/numerical modeling of GRB afterglow emissions

## Penn State Graduate Teaching Assistant (State College, PA, USA, 2016–2022)

Coordinating experiments/labs, grading assignments, offering office hours, and proctoring exams for graduate (G) and undergraduate (UG) courses in the Physics Department

- Laboratory coordinator and lecturer: Electromagnetism (UG), Introductory Physics (UG)
- Grader and office hour leader: Quantum Mechanics (G), Special and General Relativity (UG), Methods of Theoretical Physics (G)

## Professional and Outreach Activities

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Referee	MNRAS, MNRAS Letters; ApJ, ApJL; PRD
2024	Organizing Committee Member for the 3rd Numerical Lepto-Hadronic Modeling Workshop
2023	Organizing Committee Member for the DESY Astroparticle Division Retreat
2022 -	DESY Theoretical Astroparticle Seminar Organizer
2021	Abstract Sorting Committee of AAS 239th Annual Meeting
2021	Journal Club Organizer for the Center of Multimessenger Astrophysics
2017 - 2022	Guest Lecturer and co-organizer for the AstroFest (4-night outreach, 2500+ visitors)
2018	Astropy Demonstrator at K-12 Educators - Bring Cutting-Edge STEM Research into Classroom (2-day outreach, 100+ high-school teachers)

## References

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**Dr. Walter Winter** ([walter.winter@desy.de](mailto:walter.winter@desy.de))

Group leader theoret. astroparticle physics  
Deutsches Elektronen-Synchrotron (DESY), Zeuthen

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

Professor, Physics and Astronomy & Astrophysics  
Pennsylvania State University, USA

**Dr. Cecilia Lunardini** ([cecilia.lunardini@asu.edu](mailto:cecilia.lunardini@asu.edu))

Professor, Department of Physics  
Arizona State University, USA

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

Eberly Chair Professor Emeritus, Astronomy & Astrophysics and Physics  
Pennsylvania State University, USA

# Publications

 Google Scholar |  iNSPIRE

Refereed: 19; 1st-author publications: 13; \*highlighted

1. \*Yuan, C., Fiorillo, D. F. G., Petropoulou, M., Liu, Q. (2025) "Coupled Time-Dependent Proton Acceleration and Leptonic-Hadronic Radiation in Turbulent Supermassive Black Hole Coronae", arXiv: 2508.08233 (submitted to PRL)
2. Yuan, C., Pfeiffer, L., Winter, W., Buson, S., et al (2025) "An Accretion Flare Interpretation for the UHE Neutrino Event KM3-230213A", arXiv: 2506.21111 (submitted to ApJL)
3. Yuan, C., Winter, W., Zhang, B. T., Murase, K., Zhang, B., (2024), "Revisiting X-ray Afterglows of Jetted Tidal Disruption Events with the External Reverse Shock", arXiv: 2411.07925, ApJ 982 196
4. Li, R., Yuan, C., He, H., et al. (2024), "A neutrino flare associated with X-ray emission from TDE ATLAS17jr", arXiv: 2411.06440, submitted to ApJL  
*Contribution: theoretical model development, numerical calculation of neutrino and EM cascade emissions, paper writing*
5. Plotko, P., Lunardini, C., Winter, W., Yuan, C. (2024), "Ultra-High-Energy Cosmic Rays from Neutrino-Emitting Tidal Disruption Events", arXiv: 2410.19047, submitted to ApJ  
*Contribution: model building, TDE source parameter justification, results interpretation, and paper writing*
6. \*Yuan, C., Zhang, B. T., Winter, W., Murase, K., (2024), "Structured Jet Model for Multiwavelength Observations of the Jetted Tidal Disruption Event AT 2022cmc", ApJ 974 162
7. Klinger, M., Yuan, C., Taylor, A., Winter, W., (2024), "Lepto-Hadronic Scenarios for TeV Extensions of Gamma-Ray Burst Afterglow Spectra", arXiv:2403.13902, submitted to ApJ  
*Contribution: model building and results interpretation; neutrino figure production*
8. Yuan, C., Winter, W., Lunardini, C., (2024), "AT2021lwx: Another Neutrino-Coincident Tidal Disruption Event with a Strong Dust Echo?", ApJ 969 136
9. Klinger, M., Rudolph, M., Rodrigues, X., Yuan, C., Fichet de Clairfontaine, G., Fedynitch, A., Winter, W., Pohl, M., Gao, S. (2023), "AM3: An Open-Source Tool for Time-Dependent Lepto-Hadronic Modeling of Astrophysical Sources", arXiv: 2312.13371, Astrophys. J. Suppl. 275 1  
*Contribution: code development, tests, and documentation; TDE section writing*
10. Yuan, C., and Winter, W. (2023), "Electromagnetic Cascade Emission from Neutrino-Coincident Tidal Disruption Events", ApJ 956 30
11. 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  
*Contribution: model building and results interpretation; GRB code (AMES) developing*
12. \*Yuan, C., Murase, K., Guetta, D., Pe'er, A., Bartos, I., & Mészáros, P. (2022) "GeV Signature of Short Gamma-Ray Bursts in Active Galactic Nuclei", ApJ 932 80

13. Zhang, B.T., Murase, K., Ioka, K., Song, D., **Yuan, C.**, Meszaros, P. (2023) “External Inverse-Compton and Proton Synchrotron Emission from the Reverse Shock as the Origin of VHE  $\gamma$ -Rays from Hyper-Bright GRB 221009A”, *ApJL* 947 L14  
*Contribution: model building and results interpretation*
14. **\*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
15. **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
16. **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
17. **Yuan, C.**, Murase, K. & Mészáros, P. (2019) “Secondary Radio and X-ray Emissions from Galaxy Mergers”, *ApJ*, 878:76
18. **Yuan, C.**, Mészáros, P., Murase K. & Jeong, D. (2018) “Cumulative Neutrino and Gamma-Ray Backgrounds from Halo and Galaxy Mergers”, *ApJ*, 857:50
19. **Yuan, C.** & Wang, F. (2015) “Cosmological Test Using Strong Gravitational Lensing Systems”, *MNRAS*, 452:3