

REBECCA DIESING

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EDUCATION

University of Chicago <i>PhD in Astronomy and Astrophysics</i>	2017– 2023
Northwestern University <i>Bachelor of Arts in Physics (Summa Cum Laude)</i>	2013 – 2017

RESEARCH INTERESTS

- Acceleration and propagation of Galactic cosmic rays
- Evolution of astrophysical shocks, including supernova remnants, novae, and black hole winds
- Multi-messenger emission from extreme astrophysical phenomena
- Astroparticle instrumentation

RESEARCH EXPERIENCE

THEA Fellow Columbia University, New York City, NY	2025 – 2027
Member (Postdoctoral Scholar) Institute for Advanced Study, Princeton, NJ	2023 – 2025
Graduate Research Assistant University of Chicago, Chicago, IL <i>The Maximum Energy of Shock-Accelerated Cosmic Rays</i> Advisors: Damiano Caprioli & Angela V. Olinto	2017 – 2023
Undergraduate Research Assistant Northwestern University, Evanston, IL <i>Radio Observations of the Supermassive Black Hole at the Galactic Center and its Orbiting Magnetar</i> Advisor: Farhad Yusef-Zadeh	2014 – 2017
Intern CERN (University of Michigan REU), Meyrin, Switzerland <i>Using Machine Learning to Search for Minimally Supersymmetric Standard Model Higgs Bosons</i> Advisor: Jan Steggemann	2016
Intern Fermilab (SULI Program), Batavia, IL <i>A Simple Event Display for the DarkSide-50 Time Projection Chamber</i> Advisor: Stephen Pordes	2015

AWARDS & GRANTS

Co-I: NASA Fermi GI Program <i>Grant NNH22ZDA001N-FERMI; Interpreting the Gamma-Ray Emission from Novae</i>	2023
William Rainey Harper Dissertation Fellowship <i>\$4,000 awarded to outstanding PhD candidates; one of the University of Chicago's highest honors</i>	2022

Eugene and Niesje Parker Graduate Student Fellowship <i>One year of full funding awarded to an outstanding graduate student in high energy astrophysics</i>	2019
International School of Cosmic Ray Astrophysics Best Poster	2018
University of Chicago Eckhardt Scholarship <i>\$40,000 awarded to select graduate students in the physical sciences</i>	2017
Northwestern University Oliver Marcy Scholar <i>\$400 awarded to top students in the physical sciences</i>	2017
Northwestern University Best Honors Thesis in Physics	2017
Northwestern University Undergraduate Research Grant <i>\$1,000 to study the Galactic Center at the NRAO facility in Socorro, NM</i>	2016
Northwestern University Best Junior in Physics	2016

TEACHING EXPERIENCE

Instructor <i>The Physics of Stars</i>, University of Chicago, Chicago, IL <i>The Physics of Stars is a three-week immersion course for advanced high school students.</i>	2019
Tutor Strive Tutoring, Chicago, IL <i>Strive offers free after-school programming to underserved students in Chicago.</i>	2018 – 2019
Curriculum Designer Space Explorers, Chicago, IL <i>Space Explorers is a free program that immerses underserved Chicago students in science.</i>	2018
Teaching Assistant University of Chicago, Chicago, IL <i>PHSC12600, "Matter, Energy, Space, and Time"; PHSC12610, "Black Holes"; PHSC12620, "The Big Bang"</i>	2017 – 2018
GSW Senior Mentor Northwestern University, Evanston, IL <i>GSW provides weekly review sessions to students in introductory STEM courses.</i>	2014 – 2017
Tutor Northwestern University Dept. of Physics & Astronomy, Evanston, IL	2014 – 2017

RESEARCH MENTORSHIP

Graduate Students

Emily Simon

Undergraduates (theory projects)

Shoshana Chipman; Khadijat Durojaiye; Nick Corso; Rohan Venkat

Undergraduates (design, construction, and calibration of the University of Chicago Infrared Camera)

Khadijat Durojaiye; Zoë de Beurs; Seamus Flannery; Kameron Mehling; Emily Donovan; Alexa Bukowski; Noah Friedlander; Alex Miller

DIVERSITY, EQUITY, AND INCLUSION

Co-Leader of IDEA (Inclusion, Diversity, and Equity in Astronomy) | University of Chicago, Chicago, IL
IDEA is a journal club and advocacy group for junior members of U Chicago's Astronomy & Astrophysics Department.

Mentor | Society of Women in Physics at the University of Chicago, Chicago, IL

The SWiP mentorship program is a collaboration between graduate and undergraduate students that connects women in physics at all different stages of their educational journeys.

PROFESSIONAL SERVICE**Reviewer**

Physical Review; The Astrophysical Journal; Astronomy & Astrophysics; Monthly Notices of the Royal Astronomical Society; Advances in Space Research

Seminar & Workshop Organization

Organizer, IAS Astrophysics Seminar Series

Committees

Member, Curriculum Committee, U Chicago; Member, Website Committee, U Chicago

Collaborations

Member, JEM-EUSO Collaboration; Member, HEX-P Collaboration

ADDITIONAL SKILLS**Computer Languages & Programs**

Python, C++, Fortran, ROOT, CASA, AIPS, Wolfram Mathematica, Adobe Creative Suite

PRESENTATIONS

**denotes invited talk*

Seminars

- Astrophysics Seminar | Institute for Advanced Study, Princeton, NJ* October, 2023
- Chalk Talk | University of Chicago, Chicago, IL May, 2023
- CCAPP Seminar | The Ohio State University, Columbus, OH* November, 2022
- KIPAC Tea Talk | Stanford University, Palo Alto, CA* November, 2022
- THEA Seminar | Columbia University, New York City, NY October, 2022
- Seminar | Princeton University, Princeton, NJ October, 2022
- Monday Science Seminar | University of Wisconsin, Madison, WI* September, 2022
- Explosive Astro Seminar | University of California, Berkeley, CA September, 2022
- Seminar at Group Meeting | University of California, Santa Barbara, CA* January, 2022
- Seminar | RWTH Aachen University, Aachen, Germany* October, 2021
- Tuesday Seminar | University of Chicago, Chicago, IL* October, 2021
- HELIX Journal Club | University of Michigan, Ann Arbor, MI* June, 2020
- Milky Way Discussion Group | University of Chicago, Chicago, IL* January, 2020
- Special Seminar | Arcetri Astrophysical Observatory, Florence, Italy June, 2019
- Chalk Talk | University of Chicago, Chicago, IL October, 2018

Conference Talks

- TeV Particle Astrophysics | Chicago, IL August, 2024
- COSPAR 2024 | Busan, South Korea* July, 2024
- Supernova Remnants III | Chania, Crete, Greece June, 2024

○ Aspen Workshop on Cosmic Ray Feedback Aspen, CO	May, 2024
○ PCTS Workshop on Synergistic Approaches to Particle Transport Princeton, NJ	April, 2024
○ 38 th International Cosmic Ray Conference Nagoya, Japan	July, 2023
○ 241 st American Astronomical Society Meeting Seattle, WA	January, 2023
○ 32 nd JEM-EUSO Collaboration Meeting Saitama, Japan	November, 2022
○ Supernova Remnants and Their Progenitors Cambridge, MA	August, 2022
○ 31 st JEM-EUSO Collaboration Meeting Golden, CO	June, 2022
○ 30 th JEM-EUSO Collaboration Meeting Paris, France	December, 2021
○ Plenary at the 37 th International Cosmic Ray Conference Berlin, Germany*	July, 2021
○ 29 th JEM-EUSO Collaboration Meeting Golden, CO	June, 2021
○ American Physical Society Meeting Online	April, 2021
○ 27 th JEM-EUSO Collaboration Meeting Moscow, Russia	June, 2020
○ 235 th American Astronomical Society Meeting Honolulu, HI	January, 2020
○ 36 th International Cosmic Ray Conference Madison, WI	August, 2019
○ Supernova Remnants II Chania, Crete, Greece	June, 2019
○ Cosmic Explosions 2019 Cargèse, Corsica, France	June, 2019
○ 23 rd JEM-EUSO Collaboration Meeting Mürren, Switzerland	June, 2018

PUBLICATIONS

*denotes research mentee

First author & significant contribution

- [1] R. Diesing and S. Gupta 2025 | accepted to ApJ | arXiv:2411.18679
Nonthermal Signatures of Radiative Supernova Remnants II: The Impact of Cosmic Rays and Magnetic Fields
- [2] R. Diesing, M. Guo, C.-G. Kim, et al. 2024 | ApJ 974, 2 | arXiv:2404.15396
Nonthermal Signatures of Radiative Supernova Remnants
- [3] R. Diesing 2023 | ApJ 958, 1 | arXiv:2305.07697
The Maximum Energy of Shock-Accelerated Cosmic Rays
- [4] R. Diesing, B. Metzger, E. Aydi et al. 2023 | ApJ 947, 2 | arXiv:2211.02059
Evidence for multiple shocks from the gamma-ray emission of RS Ophiuchi
- [5] N. Corso*, R. Diesing, and D. Caprioli 2023 | ApJ 954, 1 | arXiv:2301.10257
Hadronic versus leptonic origin of gamma-ray emission from supernova remnants
- [6] R. Diesing and D. Caprioli 2021 | ApJ 922, 1 | arXiv:2107.08520
Steep Cosmic Ray Spectra with Revised Diffusive Shock Acceleration
- [7] Fermi-LAT Collaboration, R. Diesing, and D. Caprioli 2021 | ApJ 921, 144 | arXiv:2105.11469
Gamma Rays from Fast Black-hole Winds
- [8] R. Diesing and D. Caprioli 2020 | PRD 101, 103030 | arXiv:2001.02240
Nonsecondary Origin of Cosmic Ray Positrons
- [9] S. Chipman*, R. Diesing, M. H. Reno et al. 2019 | PRD 100, 063011 | arXiv:1906.11736
Anomalous ANITA air shower events and tau decays

- [10] R. Diesing and D. Caprioli 2019 | PRL 123, 071101 | arXiv:1905.07414
On the Spectrum of Electrons Accelerated in Supernova Remnants
- [11] R. Diesing and D. Caprioli 2018 | PRL 121, 091101 | arXiv:1804.09731
Effect of Cosmic Rays on the Evolution and Momentum Deposition of Supernova Remnants
- [12] F. Yusef-Zadeh, R. Diesing, M. Wardle et al. 2015 | ApJL 811, L35 | arXiv:1509.03337
*Radio Continuum Emission from the Magnetar SGR J1745-2900: Interaction with Gas Orbiting Sgr A**

Contributing author

- [13] A. J. Nayana, R. Margutti, E. Wiston, et al. 2024 | submitted | arXiv:2411.02647
Dinosaur in a Haystack : X-ray View of the Entrails of SN 2023ixf and the Radio Afterglow of Its Interaction with the Medium Spawned by the Progenitor Star (Paper 1)
- [14] The JEM-EUSO Collaboration 2024 | Astroparticle Physics 165, 103046 | arXiv:2406.13673
The EUSO-SPB2 Fluorescence telescope for the Detection of Ultra-High Energy Cosmic Rays
- [15] The JEM-EUSO Collaboration 2024 | Journal of Instrumentation 19, P01007 | arXiv:2309.02577
EUSO-Offline: A comprehensive simulation and analysis framework
- [16] The JEM-EUSO Collaboration 2024 | Astroparticle Physics 154, 102891 | arXiv:2401.06525
EUSO-SPB1 mission and science
- [17] The JEM-EUSO Collaboration 2023 | EPJ C 83, 1028 | arXiv:2311.12656
Developments and results in the context of the JEM-EUSO program obtained with the ESAF simulation and analysis framework
- [18] S. Reynolds, H. An, M. Abdelmaguid et al. 2023 | FrASS 10, 1321278 | arXiv:2311.04952
The High Energy X-Ray Probe (HEX-P): Supernova remnants, pulsar wind nebulae, and nuclear astrophysics
- [19] K. Mori, S. Reynolds, H. An et al. 2023 | FrASS 10, 1303197 | arXiv:2311.04851
The High Energy X-Ray Probe (HEX-P): Galactic PeVatrons, star clusters, superbubbles, microquasar jets, and gamma-ray binaries
- [20] The POEMMA Collaboration 2021 | JCAP 2021, 007 | arXiv:2012.07945
The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) Observatory

Non-refereed

- [21] R. Diesing, S. Meyer, J. Eser et al. 2023 | PoS ICRC2023, 450 | arXiv:2310.08607
Infrared Cloud Monitoring with UCIRC2
- [22] R. Diesing, B. Metzger, E. Aydi et al. 2023 | PoS ICRC2023, 865
Using Gamma-Rays to Reveal the Evolution of Novae
- [23] R. Diesing, S. Meyer, A. V. Olinto et al. 2022 | PoS 395, 214 | arXiv:2112.09618
UCIRC2: EUSO-SPB2's Infrared Cloud Monitor
- [24] R. Diesing and D. Caprioli 2022 | PoS 395, 29 | arXiv:2109.11022
Galactic Cosmic Ray Acceleration with Steep Spectra
- [25] R. Diesing, S. Meyer, A. V. Olinto et al. 2019 | PoS 358, 241 | arXiv:1909.02663
UCIRC2: An Infrared Cloud Monitor for EUSO-SPB2

[26] The POEMMA Collaboration 2019 | PoS 358, 378 | arXiv:1909.09466
The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) mission