

# REBECCA DIESING

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## EDUCATION

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

## RESEARCH INTERESTS

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- 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

## RESEARCH EXPERIENCE

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

## AWARDS & GRANTS

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| <b>Co-I: NASA Fermi GI Program</b><br><i>Grant NNH22ZDA001N-FERMI; Interpreting the Gamma-Ray Emission from Novae</i>   | 2023 |
| <b>William Rainey Harper Dissertation Fellowship</b><br><i>\$4,000 awarded to outstanding PhD candidates; one of the University of Chicago's highest honors</i>       | 2022 |
| <b>Eugene and Niesje Parker Graduate Student Fellowship</b><br><i>One year of full funding awarded to an outstanding graduate student in high energy astrophysics</i> | 2019 |

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| <b>International School of Cosmic Ray Astrophysics Best Poster</b>   | <b>2018</b> |
| <b>University of Chicago Eckhardt Scholarship</b><br><i>\$40,000 awarded to select graduate students in the physical sciences</i>              | <b>2017</b> |
| <b>Northwestern University Oliver Marcy Scholar</b><br><i>\$400 awarded to top students in the physical sciences</i>                           | <b>2017</b> |
| <b>Northwestern University Best Honors Thesis in Physics</b>   | <b>2017</b> |
| <b>Northwestern University Undergraduate Research Grant</b><br><i>\$1,000 to study the Galactic Center at the NRAO facility in Socorro, NM</i> | <b>2016</b> |
| <b>Northwestern University Best Junior in Physics</b>  | <b>2016</b> |

## TEACHING EXPERIENCE

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

## STUDENTS MENTORED

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### Theoretical Work

Shoshana Chipman, Khadijat Durojaiye, Nick Corso, Rohan Venkat

### Instrumentation (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

## SKILLS & SERVICES

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### Diversity, Equity, and Inclusion

Co-Leader of IDEA (Inclusion, Diversity, and Equity in Astronomy), an advocacy group at U Chicago

### Reviewer

The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Physical Review

### Computer Languages & Programs

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

## PUBLICATIONS

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\*research mentee

- [15] R. Diesing 2023 | accepted to ApJ | arXiv:2305.07697  
*The Maximum Energy of Shock-Accelerated Cosmic Rays*
- [14] 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*
- [13] 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*
- [12] R. Diesing and D. Caprioli 2022 | PoS 395, 29 | arXiv:2109.11022  
*Galactic Cosmic Ray Acceleration with Steep Spectra*
- [11] R. Diesing, S. Meyer, A. V. Olinto et al. 2022 | PoS 395, 214 | arXiv:2112.09618  
*UCIRC2: EUSO-SPB2's Infrared Cloud Monitor*
- [10] R. Diesing and D. Caprioli 2021 | ApJ 922, 1 | arXiv:2107.08520  
*Steep Cosmic Ray Spectra with Revised Diffusive Shock Acceleration*
- [9] Fermi-LAT Collaboration, R. Diesing, and D. Caprioli 2021 | ApJ 921, 144 | arXiv:2105.11469  
*Gamma Rays from Fast Black-hole Winds*
- [8] The POEMMA Collaboration 2021 | JCAP 2021, 007 | arXiv:2012.07945  
*The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) Observatory*
- [7] R. Diesing and D. Caprioli 2020 | PRD 101, 103030 | arXiv:2001.02240  
*Nonsecondary Origin of Cosmic Ray Positrons*
- [6] R. Diesing, S. Meyer, A. V. Olinto et al. 2019 | PoS 358, 241 | arXiv:1909.02663  
*UCIRC2: An Infrared Cloud Monitor for EUSO-SPB2*
- [5] The POEMMA Collaboration 2019 | PoS 358, 378 | arXiv:1909.09466  
*The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) mission*
- [4] S. Chipman\*, R. Diesing, M. H. Reno et al. 2019 | PRD 100, 063011 | arXiv:1906.11736  
*Anomalous ANITA air shower events and tau decays*
- [3] R. Diesing and D. Caprioli 2019 | PRL 123, 071101 | arXiv:1905.07414  
*On the Spectrum of Electrons Accelerated in Supernova Remnants*
- [2] 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*
- [1] 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\**

## SEMINARS & CONFERENCE TALKS

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\*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

- 38<sup>th</sup> International Cosmic Ray Conference | Nagoya, Japan July, **2023**
- 241<sup>st</sup> American Astronomical Society Meeting | Seattle, WA January, **2023**
- 32<sup>nd</sup> JEM-EUSO Collaboration Meeting | Saitama, Japan November, **2022**
- Supernova Remnants and Their Progenitors | Cambridge, MA August, **2022**
- 31<sup>st</sup> JEM-EUSO Collaboration Meeting | Golden, CO June, **2022**
- 30<sup>th</sup> JEM-EUSO Collaboration Meeting | Paris, France December, **2021**
- Plenary at the 37<sup>th</sup> International Cosmic Ray Conference | Berlin, Germany\* July, **2021**
- 29<sup>th</sup> JEM-EUSO Collaboration Meeting | Golden, CO June, **2021**
- American Physical Society Meeting | Online April, **2021**
- 27<sup>th</sup> JEM-EUSO Collaboration Meeting | Moscow, Russia June, **2020**
- 235<sup>th</sup> American Astronomical Society Meeting | Honolulu, HI January, **2020**
- 36<sup>th</sup> 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<sup>rd</sup> JEM-EUSO Collaboration Meeting | Mürren, Switzerland June, **2018**