



# Trey V. Wenger

ASTROPHYSICIST

Department of Astronomy, University of Virginia  
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Research interests: Milky Way structure; interstellar medium; HII regions; high-mass star formation; galaxy formation and evolution; radio recombination lines

## Education

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### University of Virginia

Ph.D. IN ASTRONOMY, M.S. IN ASTRONOMY

Charlottesville, Virginia

Aug. 2013 - May 2019

- Dissertation: “Structure in the Milky Way”
- Advisor: Dana S. Balser, National Radio Astronomy Observatory

### Boston University

B.A. IN ASTRONOMY AND PHYSICS

Boston, Massachusetts

Aug. 2009 - May 2013

- *summa cum laude*
- College Prize in Astronomy
- Institute for Astrophysical Research Prize

## Employment

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### Research Fellow

UNIVERSITY OF VIRGINIA

Charlottesville, Virginia

Aug 2013 - Present

- Advisor: Dana S. Balser, National Radio Astronomy Observatory
- Research: the morphological and chemical structure of the Galaxy as probed by high-mass star forming regions

### Teaching Assistant

UNIVERSITY OF VIRGINIA

Charlottesville, Virginia

Aug 2014 - May 2016

- Introduction to Cosmology (Undergraduate)
- Research Methods in Astrophysics (Undergraduate)
- Observational Astronomy (Graduate)
- Introduction to Cosmology (Undergraduate)
- Observational Astronomy (Undergraduate)
- Duties: guest lectures, office hours, observational labs, assignment and exam grading

### Instructor

UNIVERSITY OF VIRGINIA

Charlottesville, Virginia

Jul 2014 - Aug 2014

- Stars, Galaxies, and the Universe (Undergraduate)
- Duties: course design, lectures, assignment and exam design and grading, observational labs

### Research Assistant

BOSTON UNIVERSITY

Boston, Massachusetts

Aug 2012 - May 2013

- Advisor: T. M. Bania, Boston University
- Research: helium and carbon radio recombination line properties in the HII Region Discovery Survey

**REU Student**

NATIONAL RADIO ASTRONOMY OBSERVATORY

*Charlottesville, Virginia*

Jun 2012 - Aug 2012

- Advisor: Dana S. Balser, National Radio Astronomy Observatory
- Research: helium and carbon radio recombination line properties in the HII Region Discovery Survey

**REU Student**

ARECIBO OBSERVATORY

*Puerto Rico*

May 2011 - Aug 2011

- Advisor: Tapasi Ghosh and Chris Salter, Arecibo Observatory
- Research: searching for transients in the Galactic Arecibo L-band Feed Array Continuum Transit Survey (GALFACTS)

**Assistant Curator**

J. B. COIT OBSERVATORY, BOSTON UNIVERSITY

*Boston, Massachusetts*

Jun 2010 - May 2013

- Duties: maintain and service telescopes, assist at open houses, maintain lab equipment

**Refereed Publications**

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- [1] L. D. Anderson, T. V. **Wenger**, W. P. Armentrout, D. S. Balser, and T. M. Bania. A Galactic Plane Defined by the Milky Way HII Region Distribution. *Astrophysical Journal Supplement Series*, submitted.
- [2] D. M. Maffucci, T. V. **Wenger**, R. Le Gal, and E. Herbst. Astrochemical Kinetic Grid Models of Groups of Molecular Abundances: Taurus Molecular Cloud 1 (TMC-1). *Astrophysical Journal*, in press.
- [3] C. D. Weins, T. V. **Wenger**, K. E. Johnson, L. Xiao, S. C. Gallagher, and P. Tzanavaris. The Occurance of Compact Groups of Galaxies Through Cosmic Time. *Astrophysical Journal*, submitted.
- [4] T. V. **Wenger**, J. M. Dickey, C. H. Jordan, D. S. Balser, W. P. Armentrout, L. D. Anderson, T. M. Bania, J. R. Dawson, N. M. McClure-Griffiths, and J. Shea. The Southern HII Region Discovery Survey I: The Bright Catalog. *Astrophysical Journal Supplement Series*, submitted.
- [5] M. Luisi, L. D. Anderson, T. M. Bania, D. S. Balser, T. V. **Wenger**, and A. A. Kepley. Hydrogen Radio Recombination Line Emission from M51 and NGC 628. *Publications of the Astronomical Society of the Pacific*, 130(8):084101, August 2018.
- [6] T. V. **Wenger**, D. S. Balser, L. D. Anderson, and T. M. Bania. Kinematic Distances: A Monte Carlo Method. *Astrophysical Journal*, 856:52, March 2018.
- [7] L. D. Anderson, W. P. Armentrout, M. Luisi, T. M. Bania, D. S. Balser, and T. V. **Wenger**. A Green Bank Telescope Survey of Large Galactic H II Regions. *Astrophysical Journal Supplement Series*, 234:33, February 2018.
- [8] T. V. **Wenger**, A. A. Khan, N. G. Ferraro, D. S. Balser, W. P. Armentrout, L. D. Anderson, and T. M. Bania. Carbon Monoxide Observations toward Star-forming Regions in the Outer Scutum-Centaurus Spiral Arm. *Astrophysical Journal*, 852:2, January 2018.

- [9] M. Luisi, L. D. Anderson, D. S. Balser, T. V. **Wenger**, and T. M. Bania. Diffuse Ionized Gas in the Milky Way Disk. *Astrophysical Journal*, 849:117, November 2017.
- [10] B.-C. Koo, G. Park, W.-T. Kim, M. G. Lee, D. S. Balser, and T. V. **Wenger**. Tracing the Spiral Structure of the Outer Milky Way with Dense Atomic Hydrogen Gas. *Publications of the Astronomical Society of the Pacific*, 129(9):094102, September 2017.
- [11] D. S. Balser, T. V. **Wenger**, W. M. Goss, K. E. Johnson, and A. A. Kepley. JVLA Observations of IC 342: Probing Star Formation in the Nucleus. *Astrophysical Journal*, 844:73, July 2017.
- [12] C. Brown, C. Jordan, J. M. Dickey, L. D. Anderson, W. P. Armentrout, D. S. Balser, T. M. Bania, J. R. Dawson, N. M. McClure-Griffiths, and T. V. **Wenger**. The Southern H II Region Discovery Survey (SHRDS): Pilot Survey. *Astronomical Journal*, 154:23, July 2017.
- [13] W. P. Armentrout, L. D. Anderson, D. S. Balser, T. M. Bania, T. M. Dame, and T. V. **Wenger**. High-mass Star Formation in the Outer Scutum-Centaurus Arm. *Astrophysical Journal*, 841:121, June 2017.
- [14] M. Luisi, L. D. Anderson, D. S. Balser, T. M. Bania, and T. V. **Wenger**. H II Region Ionization of the Interstellar Medium: A Case Study of NGC 7538. *Astrophysical Journal*, 824:125, June 2016.
- [15] L. D. Anderson, W. P. Armentrout, B. M. Johnstone, T. M. Bania, D. S. Balser, T. V. **Wenger**, and V. Cunningham. Finding Distant Galactic HII Regions. *Astrophysical Journal Supplement Series*, 221:26, December 2015.
- [16] L. D. Anderson, L. A. Hough, T. V. **Wenger**, T. M. Bania, and D. S. Balser. Untangling the Recombination Line Emission from H II Regions with Multiple Velocity Components. *Astrophysical Journal*, 810:42, September 2015.
- [17] D. S. Balser, T. V. **Wenger**, L. D. Anderson, and T. M. Bania. Azimuthal Metallicity Structure in the Milky Way Disk. *Astrophysical Journal*, 806:199, June 2015.
- [18] L. D. Anderson, T. M. Bania, D. S. Balser, V. Cunningham, T. V. **Wenger**, B. M. Johnstone, and W. P. Armentrout. The WISE Catalog of Galactic H II Regions. *Astrophysical Journal Supplement Series*, 212:1, May 2014.
- [19] T. V. **Wenger**, T. M. Bania, D. S. Balser, and L. D. Anderson. The Green Bank Telescope H II Region Discovery Survey. IV. Helium and Carbon Recombination Lines. *Astrophysical Journal*, 764:34, February 2013.

## Other Publications

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- [1] D. S. Balser, L. D. Anderson, T. M. Bania, J. M. Dickey, D. Anish Roshi, T. V. **Wenger**, and T. L. Wilson. Science with an ngVLA: Radio Recombination Lines from HII Regions. *Science with a Next-Generation VLA*, October 2018.

## Published Software

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- [1] T. V. **Wenger**. WISP: Wenger Interferometry Software Package. Astrophysics Source Code Library, submitted.
- [2] T. V. **Wenger**, D. S. Balser, L. D. Anderson, and T. M. Bania. KDUtils: Kinematic Distance Utilities. Astrophysics Source Code Library, December 2017.
- [3] T. V. **Wenger**, A. K. Kepley, and D. S. Balser. HRM: HII Region Models. Astrophysics Source Code Library, July 2017.
- [4] T. Bania, T. **Wenger**, D. Balser, and L. Anderson. TMBIDL: Single dish radio astronomy data reduction package. Astrophysics Source Code Library, May 2016.

## Competitive Observing Proposals

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|      |   |          |
|------|---|----------|
| 2018 | <b>Co-I: Galactic Chemical Structure in the Southern Sky: A Pilot Project</b> | ALMA     |
|      | C-rated: 0.7 hour   |          |
| 2017 | <b>Co-I: The GBT Diffuse Ionized Gas Survey (GDIGS)</b>                       | GBT      |
|      | Large Filler Project: 368 hours   |          |
| 2017 | <b>PI: Molecular Clouds in the Outer Scutum-Centaurus Arm</b>                 | ARO 12-m |
|      | Awarded 40 hours  |          |
| 2016 | <b>PI: Molecular Clouds in the Outer Scutum-Centaurus Arm</b>                 | ARO 12-m |
|      | Awarded 47 hours  |          |
| 2016 | <b>Co-I: Star Formation, Ionized Gas, and the Milky Way Bar</b>               | GBT      |
|      | C-rated: 30 hours   |          |
| 2015 | <b>Co-I: The Southern HII Region Discovery Survey</b>                         | ATCA     |
|      | Rated 3.7/5.0, 4.0/5.0, and 4.1/5.0: 900 hours                                |          |
| 2015 | <b>Co-I: NH3 Observations of Outer Scutum Centaurus Sources : Round Two</b>   | GBT      |
|      | A-rated: 10 hours   |          |
| 2015 | <b>Co-I: Star Formation, Ionized Gas, and the Milky Way Bar</b>               | GBT      |
|      | C-rated: 25 hours   |          |
| 2015 | <b>Co-I: Is the Milky Way a Grand Design Spiral?</b>                          | JVLA     |
|      | A-rated: 5.5 hours, C-rated: 16.5 hours                                       |          |
| 2015 | <b>PI: Metallicity Structure in the Milky Way Disk</b>                        | JVLA     |
|      | A-rated: 30 hours   |          |
| 2014 | <b>Co-I: The Lost Diffuse HII Regions</b>                                     | GBT      |
|      | A-rated: 53 hours   |          |
| 2014 | <b>Co-I: Star Formation, Ionized Gas, and the Milky Way Bar</b>               | GBT      |
|      | C-rated: 25 hours   |          |
| 2014 | <b>Co-I: Finding the Most Distant Galactic Star Formation Regions</b>         | JVLA     |
|      | B-rated: 42 hours   |          |
| 2013 | <b>Co-I: The WISE Extension of the HRDS</b>                                   | GBT      |

|      |  |                      |
|------|--|----------------------|
|      | A-rated: 50 hours  |                      |
| 2013 | <b>Co-I: <i>The Lost Diffuse HII Regions</i></b>                                   | <a href="#">GBT</a>  |
|      | A-rated: 53 hours  |                      |
| 2013 | <b>Co-I: <i>Transgalactic Abundances in the Milky Way Disk</i></b>                 | <a href="#">JVLA</a> |
|      | B-rated: 5 hours   |                      |
| 2013 | <b>Co-I: <i>How Many Ultra-Compact HII Regions Are There in the Milky Way?</i></b> | <a href="#">JVLA</a> |
|      | C-rated: 20 hours  |                      |
| 2012 | <b>Co-I: <i>A WISE Extension of the HRDS?</i></b>                                  | <a href="#">GBT</a>  |
|      | B-rated: 50 hours  |                      |

## Skills

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|                          |  |
|--------------------------|--|
| <b>Languages</b>         | English (Native), French (Intermediate)  |
| <b>Programming</b>       | Python, C/C++, Java, IDL   |
| <b>Scripting</b>         | BASH, TCSH   |
| <b>Web</b>               | HTML/HTML5, PHP, CSS, Javascript/JQuery  |
| <b>Software</b>          | $\text{\LaTeX}$ , EMACS, CASA, IRAF, Radex, GNUplot  |
| <b>Operating Systems</b> | Linux (Ubuntu, RedHat, CentOS), Mac, Windows   |
| <b>Telescopes</b>        | Green Bank Telescope (GBT), Jansky Very Large Array (JVLA), Arizona Radio Observatory (ARO) 12-m, Australia Telescope Compact Array (ATCA), Atacama Large Millimeter/sub-millimeter Array (ALMA), Apache Point Observatory 3.5-m |

## Research Grants

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|           |   |                                     |
|-----------|---|-------------------------------------|
| 2017–2018 | <b>Graduate Research Fellowship</b>                   | <a href="#">Charlottesville, VA</a> |
|           | Virginia Space Grant Consortium                       |                                     |
| 2016–2018 | <b>Grote Reber Doctoral Fellowship</b>                | <a href="#">Charlottesville, VA</a> |
|           | National Radio Astronomy Observatory                  |                                     |
| 2016      | <b>Raven Fellowship</b>                               | <a href="#">Charlottesville, VA</a> |
|           | Raven Society   |                                     |
| 2016–2017 | <b>Graduate Research Fellowship</b>                   | <a href="#">Charlottesville, VA</a> |
|           | Virginia Space Grant Consortium                       |                                     |
| 2016–2017 | <b>ARCS Scholarship</b>                               | <a href="#">Washington, D.C.</a>    |
|           | Achievement Rewards for College Scientists Foundation |                                     |
| 2013–2019 | <b>D.N. Batten Foundation Jefferson Fellowship</b>    | <a href="#">Charlottesville, VA</a> |
|           | Jefferson Scholars Foundation                         |                                     |
| 2012–2013 | <b>Undergraduate Research Outreach Program Award</b>  | <a href="#">Boston, MA</a>          |
|           | Boston University                                     |                                     |
| 2012      | <b>NSF Research Experiences for Undergraduates</b>    | <a href="#">Charlottesville, VA</a> |
|           | National Radio Astronomy Observatory                  |                                     |
| 2011      | <b>NSF Research Experiences for Undergraduates</b>    | <a href="#">Puerto Rico</a>         |
|           | Arecibo Observatory                                   |                                     |

## Honors & Awards

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|           |   |                            |
|-----------|---|----------------------------|
| 2018      | <b>Chambliss Astronomy Achievement Award</b>      | <i>Washington, D.C.</i>    |
|           | 231st American Astronomical Society Meeting       |                            |
| 2016      | <b>Laurence W. Fredrick Teaching Award</b>        | <i>Charlottesville, VA</i> |
|           | University of Virginia                            |                            |
| 2015      | <b>First Place Award and Scholarship</b>          | <i>Charlottesville, VA</i> |
|           | Huskey Research Exhibition                        |                            |
| 2015      | <b>Inductee</b>                                   | <i>Charlottesville, VA</i> |
|           | Raven Society                                     |                            |
| 2014      | <b>Second Place Award and Scholarship</b>         | <i>Charlottesville, VA</i> |
|           | Huskey Research Exhibition                        |                            |
| 2013      | <b>College Prize in Astronomy</b>                 | <i>Boston, MA</i>          |
|           | Boston University                                 |                            |
| 2013      | <b>Institute for Astrophysical Research Prize</b> | <i>Boston, MA</i>          |
|           | Boston University                                 |                            |
| 2009–2013 | <b>Dean's List</b>                                | <i>Boston, MA</i>          |
|           | Boston University                                 |                            |

## Professional Society Membership

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|            |  |                            |
|------------|--|----------------------------|
| 2018–2019  | <b>Junior Member</b>                               | <i>Charlottesville, VA</i> |
|            | UVA Society of Fellows, philanthropic organization |                            |
| 2017–2018  | <b>President</b>                                   | <i>Charlottesville, VA</i> |
|            | Raven Society, prestigious UVA honor society       |                            |
| Since 2015 | <b>Member</b>                                      | <i>Charlottesville, VA</i> |
|            | Raven Society, prestigious UVA honor society       |                            |
| Since 2013 | <b>Member</b>                                      | <i>Boston, MA</i>          |
|            | Phi Beta Kappa                                     |                            |
| Since 2011 | <b>Junior/Graduate Student Member</b>              | <i>USA</i>                 |
|            | American Astronomical Society                      |                            |
| 2010–2012  | <b>President</b>                                   | <i>Boston, MA</i>          |
|            | Boston University Astronomical Society             |                            |
| 2009–2013  | <b>Member</b>                                      | <i>Boston, MA</i>          |
|            | Boston University Astronomical Society             |                            |

## Teaching Experience

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|      |  |            |
|------|--|------------|
| 2016 | <b>Teaching Assistant</b>                        | <i>UVA</i> |
|      | Introduction to Cosmology (Undergraduate)        |            |
| 2016 | <b>Teaching Assistant</b>                        | <i>UVA</i> |
|      | Research Methods in Astrophysics (Undergraduate) |            |
| 2015 | <b>Teaching Assistant</b>                        | <i>UVA</i> |
|      | Observational Astronomy (Graduate)               |            |
| 2015 | <b>Teaching Assistant</b>                        | <i>UVA</i> |
|      | Introduction to Cosmology (Undergraduate)        |            |

|      |  |     |
|------|--|-----|
| 2014 | <b>Teaching Assistant</b><br>Observational Astronomy (Undergraduate)   | UVA |
| 2014 | <b>Instructor</b><br>Stars, Galaxies, and the Universe (Undergraduate) | UVA |

## Research Mentoring Experience

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|           |   |      |
|-----------|---|------|
| 2018      | <b>Summer Student: Maryam Hami</b><br>Project: <i>Is the Milky Way a Grand Design Spiral?</i>   | NRAO |
| 2017      | <b>Summer Student: Wesley Red</b><br>Project: <i>Probing the Galactic Structure of the Milky Way with HII Regions</i>                       | NRAO |
| 2016      | <b>Summer Student: Jeanine Shea</b><br>Project: <i>Southern H+ Region Discovery Survey</i>  | NRAO |
| 2015–2018 | <b>Undergraduate Student: Nicholas Ferraro</b><br>Thesis: <i>Investigating the Edge of High Mass Star Formation in the Milky Way Galaxy</i> | UVA  |
| 2015–2018 | <b>Undergraduate Student: Asad Khan</b><br>Thesis: <i>Investigating Molecular Cloud Physical Properties in the Milky Way Galaxy</i>         | UVA  |
| 2015      | <b>Summer Student: Jonathan Barnes</b><br>Project: <i>Probing Metallicity Structure across the Milky Way Disk with the VLA</i>              | NRAO |

## Outreach & Service

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|-----------|---|---------------------|
| 2018–2019 | <b>Lead Organizer</b><br>Astronomy on Tap Charlottesville, community outreach program | Charlottesville, VA |
| 2018      | <b>Organizer</b><br>Bob Rood Memorial Research Symposium                              | Charlottesville, VA |
| 2017–2018 | <b>President</b><br>Raven Society   | Charlottesville, VA |
| 2017      | <b>Chair</b><br>Gray-Carrington Memorial Fellowship Committee                         | Charlottesville, VA |
| 2017      | <b>Member</b><br>UVA Astronomy Graduate Admissions Committee                          | Charlottesville, VA |
| 2017      | <b>Organizer</b><br>Bob Rood Memorial Research Symposium                              | Charlottesville, VA |
| 2016–2019 | <b>Member</b><br>Raven Society Leadership Council                                     | Charlottesville, VA |
| 2016      | <b>Volunteer Speaker</b><br>Charlottesville Astronomical Society                      | Charlottesville, VA |
| 2015      | <b>Organizer</b><br>Forum for Interdisciplinary Dialogue Research Symposium           | Charlottesville, VA |

|           |  |                     |
|-----------|--|---------------------|
| 2013–2019 | <b>Co-founder</b><br>Astronomy Undergraduate Mentorship Program              | Charlottesville, VA |
| 2013–2019 | <b>Volunteer Webmaster</b><br>UVA Astronomy Department                       | Charlottesville, VA |
| 2013–2019 | <b>Volunteer</b><br>Dark Skies, Bright Kids, community outreach program      | Charlottesville, VA |
| 2013–2019 | <b>Volunteer and Speaker</b><br>Charlottesville-area observatory open houses | Charlottesville, VA |
| 2010–2012 | <b>President</b><br>Boston University Astronomical Society                   | Boston, MA          |
| 2009–2013 | <b>Member</b><br>Boston University Astronomical Society                      | Boston, MA          |

## Invited Talks

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|           |   |                     |
|-----------|---|---------------------|
| Sep. 2018 | <b>SMA Seminar</b><br>Center for Astrophysics   | Cambridge, MA       |
| Apr. 2018 | <b>Research Symposium</b><br>Virginia Space Grant Consortium Research Conference              | Norfolk, VA         |
| Mar. 2018 | <b>Research Symposium</b><br>Bob Rood Memorial Symposium                                      | Charlottesville, VA |
| May 2017  | <b>Lunch Talk</b><br>University of Tasmania   | Hobart, TAS         |
| Apr. 2017 | <b>Research Symposium</b><br>Virginia Space Grant Consortium Research Conference              | Williamsburg, VA    |
| Apr. 2017 | <b>Research Symposium</b><br>ARCS Foundation Metro-Washington D.C. Chapter                    | Charlottesville, VA |
| Mar. 2017 | <b>Research Symposium</b><br>Bob Rood Memorial Research Symposium                             | Charlottesville, VA |
| Nov. 2016 | <b>Lunch Talk</b><br>Boston University  | Boston, MA          |
| Oct. 2016 | <b>Research Symposium</b><br>ARCS Metro-Washington D.C. Chapter, National Academy of Sciences | Washington, D.C.    |
| Sep. 2016 | <b>Lunch Talk</b><br>National Radio Astronomy Observatory                                     | Charlottesville, VA |
| Apr. 2016 | <b>Invited Talk</b><br>Charlottesville Astronomical Society                                   | Charlottesville, VA |
| Oct. 2015 | <b>Research Symposium</b><br>Bob Rood Memorial Symposium                                      | Charlottesville, VA |
| Feb. 2015 | <b>Research Symposium</b><br>Jefferson Scholars Foundation                                    | Charlottesville, VA |

## Professional References

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|                             |   |
|-----------------------------|---|
| <b>Dr. Dana Balser</b>      | National Radio Astronomy Observatory<br>+1 (434) 296-0242<br><a href="mailto:dbalser@nrao.edu">dbalser@nrao.edu</a> |
| <b>Prof. Thomas Bania</b>   | Boston University<br>+1 (617) 353-3652<br><a href="mailto:bania@bu.edu">bania@bu.edu</a>                            |
| <b>Prof. Kelsey Johnson</b> | University of Virginia<br>+1 (434) 924-4349<br><a href="mailto:kej7a@virginia.edu">kej7a@virginia.edu</a>           |

## Conference Proceedings

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- [1] D. S. Balser, T. V. **Wenger**, T. M. Bania, and L. D. Anderson. Metallicity Structure across the Galactic Disk: Radio Observations of H ii Regions. In C. Chiappini, I. Minchev, E. Starkenburg, and M. Valentini, editors, *Rediscovering Our Galaxy*, volume 334 of *IAU Symposium*, pages 275–276, August 2018.
- [2] T. V. **Wenger**, D. S. Balser, L. D. Anderson, and T. M. Bania. Structure in the Milky Way. In C. Chiappini, I. Minchev, E. Starkenburg, and M. Valentini, editors, *Rediscovering Our Galaxy*, volume 334 of *IAU Symposium*, pages 381–382, August 2018.
- [3] W. P. Armentrout, L. Anderson, T. V. **Wenger**, D. Balser, and T. Bania. A Complete VLA Census of the ~7000 Milky Way HII Regions. In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 445.04, January 2018.
- [4] A. M. Burkhardt, A. M. Matthews, K. E. Johnson, I. Avilez, L. Beale, L. E. Bittle, D. Bordenave, M. Finn, A. Firebaugh, D. Hancock, P. Hughes, C. Rochford Hayes, H. Lewis, S. Linden, S. Liss, M. Liu, S. McNair, E. Murphy, B. Prager, M. Pryal, W. Richardson, Y. Song, N. Troup, J. Villadsen, T. V. **Wenger**, and R. F. Wilson. Dark Skies, Bright Kids Year 9. In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 360.01, January 2018.
- [5] N. Ferraro, T. V. **Wenger**, A. Khan, D. Balser, W. P. Armentrout, L. D. Anderson, and T. Bania. Carbon Monoxide Observations Toward Star Forming Regions in the Outer Scutum-CentaurusSpiral Arm. In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 247.18, January 2018.
- [6] B.-C. Koo, G. Park, W.-T. Kim, M. G. Lee, D. Balser, and T. **Wenger**. A New HI Face-on Map of the Outer Milky Way. In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 237.04, January 2018.
- [7] B. Liu, L. D. Anderson, M. Luisi, D. Balser, T. Bania, T. **Wenger**, L. M. Haffner, R. Minchin, A. Roshi, E. Churchwell, Y. Terzian, T. McIntyre, M. Lebron, and G. T. SIGGMA Team. Radio Recombination Line Surveys of the inner Galactic Plane: SIGGMA and GDIGS. In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 247.31, January 2018.

- [8] M. Luisi, L. D. Anderson, B. Liu, T. Bania, D. Balser, T. **Wenger**, and L. M. Haffner. The GBT Diffuse Ionized Gas Survey (GDIGS). In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 230.06, January 2018.
- [9] W. A. Red, T. V. **Wenger**, D. Balser, L. Anderson, and T. Bania. Probing the Galactic Structure of the Milky Way with H II Regions. In *American Astronomical Society Meeting Abstracts #231*, volume 231 of *American Astronomical Society Meeting Abstracts*, page 247.07, January 2018.
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