

# SUSAN E. CLARK

## *Curriculum Vitae*

School of Natural Sciences  
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github: seclark

### APPOINTMENTS

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| Hubble Fellow                        | 2017 – present |
| Member, Institute for Advanced Study | 2017 – present |

### EDUCATION

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| <b>Columbia University</b>                                       |      |
| Ph.D., Astrophysics  | 2017 |
| Dissertation: <i>Magnetic Fields in the Interstellar Medium</i>  |      |
| Advisors: Mary E. Putman, Joshua E.G. Peek                       |      |
| M.A., M.Phil, Astrophysics                                       | 2014 |
| <b>The University of North Carolina at Chapel Hill</b>           |      |
| B.S., Physics  | 2012 |
| <b>Thomas Jefferson High School for Science &amp; Technology</b> | 2008 |

### HONORS, AWARDS AND GRANTS

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| Hubble Fellowship  | 2017 - 2020 |
| Institute for Advanced Study School of Natural Sciences Fellowship | 2020 - 2022 |
| Einstein Fellowship  | declined    |
| NSF Graduate Research Fellowship                                   | 2012 – 2017 |
| Columbia Dean’s Fellowship   | 2012 – 2017 |
| ASNY Graduate Student Paper Prize                                  | 2016        |
| CCAPP Prize Prize in Cosmology and AstroParticle Physics           | 2016        |
| PI, VLA Observing Proposal 16A-133, 8 hours                        | 2016        |
| PRL Editors’ Recommendation Paper                                  | 2015        |
| Morehead-Cain Scholarship  | 2008 – 2012 |
| <a href="#">Full scholarship</a> to UNC-Chapel Hill                |             |

### PUBLICATIONS

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First- and single-author refereed journal articles

7. **S.E. Clark** & B.S. Hensley. *Mapping the Magnetic Interstellar Medium in Three Dimensions Over the Full Sky with Neutral Hydrogen*. 2019, submitted.
6. **S.E. Clark**, J.E.G. Peek, M.-A. Miville-Deschênes. *The physical nature of neutral hydrogen intensity structure*. 2019, ApJ 874, 171. [arXiv:1902.01409](#)
5. **S.E. Clark**. *A new probe of line-of-sight magnetic field tangling*. 2018, ApJL 857, L10. [arXiv:1802.00011](#)

4. **S.E. Clark** & J.S. Oishi. *The weakly nonlinear magnetorotational instability in a global, cylindrical Taylor-Couette flow*. 2017, ApJ 841, 2. [arXiv:1610.01603](#)
3. **S.E. Clark** & J.S. Oishi. *The weakly nonlinear magnetorotational instability in a local geometry*. 2017, ApJ 841, 1. [arXiv:1610.01616](#)
2. **S.E. Clark**, J. Colin Hill, J.E.G. Peek, M.E. Putman, B.L. Babler. *Neutral hydrogen structures trace dust polarization angle: Implications for cosmic microwave background foregrounds*. 2015, PRL 115, 241302. Selected as PRL Editors' Recommendation. [arXiv:1508.07705](#).
1. **S.E. Clark**, J.E.G. Peek, M.E. Putman. *Magnetically aligned HI fibers and the Rolling Hough Transform*. 2014, ApJ 789, 82. [arXiv:1312.1338](#)

#### Other refereed journal articles

7. J.E.G. Peek & **S.E. Clark**. *Small-Scale HI Channel Map Structure is Cold: Evidence from Na I Absorption at High Galactic Latitudes*. 2019, submitted. [arXiv:1909.09647](#)
6. A.J.M. Thomson, T.L. Landecker, [11 authors], **S.E. Clark**, [2 authors]. *Through thick or thin: Multiple components of the magneto-ionic medium towards the nearby HII region Sharpless 2-27 revealed by Faraday tomography*. 2019, MNRAS 487, 4751. [arXiv:1905.09285](#)
5. J.E.G. Peek, B.L. Babler, Y. Zheng, **S.E. Clark**, K.A. Douglas, E.J. Korpela, M.E. Putman, S. Stanimirović, S.J. Gibson, C. Heiles. *The GALFA-HI Survey Data Release 2*. 2018, ApJS 234, 1. [ADS](#)
4. F. Heitsch, B. Bartell, **S.E. Clark**, J.E.G. Peek, D. Cheng, M.E. Putman. *Three-dimensional orientation of compact high velocity clouds*. 2016, MNRAS Letters 462, L46. [arXiv:1606.06689](#)
3. J. Malinen, L. Montier, J. Montillaud, M. Juvela, I. Ristorcelli, **S.E. Clark**, O. Berné, J.-Ph. Bernard, V.-M. Pelkonen, D.C. Collins. *Matching dust emission structures and magnetic field in high-latitude cloud L1642: comparing Herschel and Planck maps*. 2016, MNRAS 460, 1934. [arXiv:1512.03775](#)
2. N.M. McClure-Griffiths, S. Stanimirović, [5 authors], **S.E. Clark**, [3 authors]. *Galactic and Magellanic evolution with the SKA*. 2015, from "Advancing Astrophysics with the Square Kilometre Array", PoS. [arXiv:1501.01130](#)
1. W.-H. Hsu, M.E. Putman, F. Heitsch, S. Stanimirović, J.E.G. Peek, **S.E. Clark**. *Physical properties of Complex C halo clouds*. 2011, AJ 141, 57 [arXiv:1011.0011](#)

#### Conference proceedings

2. **S.E. Clark**. *Galactic neutral hydrogen and the magnetic ISM foreground*. 2017, in Jelić & van der Hulst (Eds.) *Peering towards Cosmic Dawn*, Proceedings of the International Astronomical Union, Symposium No. 333, Dubrovnik, Croatia
1. **S.E. Clark**, J.E.G. Peek, J. Colin Hill, M.E. Putman. *Quantifying the magnetic alignment of HI and dust in the diffuse ISM*. 2016, In P. Jablonka, Ph. André, F. van der Tak (Eds.) *From Interstellar Clouds to Star-forming Galaxies: Universal Processes?* Proceedings of the International Astronomical Union Symposia and Colloquia, IAU 315, Honolulu, Hawaii

#### White papers and mission proposals

7. S. Hanany et al. incl. **S.E. Clark**. *PICO: Probe of Inflation and Cosmic Origins*. 2019, Astro2020 Decadal APC White Paper. [arXiv:1908.07495](#)
6. The Simons Observatory Collaboration, incl. **S.E. Clark**. *The Simons Observatory: Astro2020 Decadal Project Whitepaper*. 2019. [arXiv:1907.08284](#)

5. L. Fissel, C.L.H. Hull, **S.E. Clark**, D.T. Chuss et al. *Studying Magnetic Fields in Star Formation and the Turbulent Interstellar Medium*. 2019, Astro2020 Science White Paper. [arXiv:1903.08757](#)
4. **S.E. Clark**, C. Heiles, T. Robishaw. *Magnetic Fields and Polarization in the Diffuse Interstellar Medium*. 2019, Astro2020 Science White Paper. [arXiv:1903.07671](#)
3. D. Stinebring, S. Chatterjee, **S.E. Clark**., J.M. Cordes, T. Dolch, C. Heiles, [12 authors]. *Twelve Decades: Probing the ISM from kiloparsec to sub-AU scales*. 2019, Astro2020 Science White Paper. [arXiv:1903.073701](#)
2. B. Hensley et al. incl. **S.E. Clark**. *Determining the Composition of Interstellar Dust with Far-Infrared Polarimetry*. 2019, Astro2020 Science White Paper. [ADS](#)
1. S. Hanany et al. incl. **S.E. Clark**. *PICO: Probe of Inflation and Cosmic Origins*. 2019, Probe class mission study for NASA and 2020 Decadal Panel. [arXiv:1902.10541](#)

## SCIENTIFIC TALKS

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Significant presentations, including 38 invited talks/colloquia

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| 60. Invited Talk, The Self-Organized Star Formation Process, Orsay, France   | Sept. 2019 |
| 59. Talk, New Perspectives on Galactic Magnetism, Newcastle upon Tyne, England   | June 2019  |
| 58. Talk, Hubble Fellows Symposium, Baltimore, Maryland  | Mar. 2019  |
| 57. Invited Talk, Pathways to the Future of Arecibo Observatory, San Juan, Puerto Rico                                   | Feb. 2019  |
| 56. Invited Talk, Princeton Gravity Group Seminar, Princeton, New Jersey   | Feb. 2019  |
| 55. Talk, Big Apple Magnetic Fields, New York, New York  | Jan. 2019  |
| 54. Invited Talk, Interstellar Filament Paradigm, Nagoya, Japan  | Nov. 2018  |
| 53. Invited Talk, The Milky Way in the Age of Gaia, Orsay, France  | Oct. 2018  |
| 52. Invited Talk, Gruber Cosmology Conference, Yale University   | Sept. 2018 |
| 51. Invited Talk, Cosmology with CMB-S4, Princeton University  | Sept. 2018 |
| 50. Invited Talk, CMB Foregrounds Workshop, Flatiron CCA, New York, New York   | June 2018  |
| 49. Invited Talk & Panel, PICO Science Meeting, University of Minnesota  | May 2018   |
| 48. Colloquium, University of Rochester  | Apr. 2018  |
| 47. Talk, Hubble Fellows Symposium, Baltimore, Maryland  | Mar. 2018  |
| 46. Invited Talk, Princeton University Wednesday Lunch Talk, Princeton, New Jersey                                       | Feb. 2018  |
| 45. Invited Talk, UC Berkeley TAC Seminar, Berkeley, California  | Dec. 2017  |
| 44. Invited Talk, CMB Foregrounds Workshop, San Diego, California  | Nov. 2017  |
| 43. Colloquium, University of Wisconsin - Madison  | Nov. 2017  |
| 42. Invited Talk, GMIMS Collaboration Workshop, DRAO, Canada   | Oct. 2017  |
| 41. Invited Talk, CIERA/Northwestern Seminar, Evanston, Illinois   | Oct. 2017  |
| 40. Invited Talk, Magnetic Fields in the Universe VI, Natal, Brazil  | Oct. 2017  |
| 39. Invited Talk, IAU Symposium 333: Peering Toward Cosmic Dawn, Dubrovnik, Croatia                                      | Oct. 2017  |
| 38. Talk, IAS Seminar, Princeton, New Jersey   | Sept. 2017 |
| 37. Invited Talk, The Interstellar Medium Beyond Three Dimensions, Orsay, France   | July 2017  |
| 36. Invited Talk, Midwest Magnetic Fields Workshop, Madison, Wisconsin   | May 2017   |
| 35. Invited Talk, Rutgers Astrophysics Seminar, New Brunswick, New Jersey  | Mar. 2017  |
| 34. Colloquium, Bates College, Lewiston, Maine   | Feb. 2017  |
| 33. Invited Talk, AAS Special Session: New, Fundamental, Cutting-Edge Science from Arecibo Observatory, Grapevine, Texas | Jan. 2017  |
| 32. Talk, AAS dissertation talk, Dust and Magnetic Fields, Grapevine, Texas  | Jan. 2017  |

31. Invited Talk, Cosmic Rays, Astrophysical Turbulence and Magnetic Reconnection, Natal, Brazil Dec. 2016
30. Invited Talk, NRAO/UVA Seminar, Charlottesville, Virginia Nov. 2016
29. Invited Talk, ASNY Prize Talk, Siena College, Albany, New York Nov. 2016
28. Invited Talk, Star Formation/ISM Rendezvous Seminar, Princeton, New Jersey Nov. 2016
27. Invited Talk, Simons Observatory Meeting, Princeton, New Jersey Nov. 2016
26. Invited Talk, OSU CCAPP Price Prize Seminar, Columbus, Ohio Sept. 2016
25. Invited Talk, Harvard-Smithsonian CfA Galaxies & Cosmology Seminar, Cambridge, Massachusetts Sept. 2016
24. Invited Talk, CITA Seminar, Toronto, Canada Aug. 2016
23. Talk, Star Formation, Magnetic Fields, and Diffuse Matter in the Galaxy, Madison, Wisconsin May 2016
22. Invited Talk, JILA Seminar, Colorado University Boulder, Boulder, Colorado Feb. 2016
21. Colloquium, American Museum of Natural History, New York, New York Jan. 2016
20. Invited Talk, Brown Astrophysics Seminar, Providence, Rhode Island Nov. 2015
19. Invited Talk, IRAP ISM Seminar, Toulouse, France Oct. 2015
18. Talk, Magnetic Fields in the Universe V, Corsica, France Oct. 2015
17. Invited Talk, IAS, ENS, and CEA/Saclay Joint ISM Seminar, IAS, Orsay, France Oct. 2015
16. Talk, Experimental CMB Journal Club, Columbia University, New York, New York Sept. 2015
15. Talk, IAU Focus Meeting 5, The Legacy of Planck, Honolulu, Hawaii Aug. 2015
14. Poster, IAU Symposium, From Interstellar Clouds to Star-Forming Galaxies: Universal Processes?, Honolulu, Hawaii Aug. 2015
13. Talk, Pontifica Universidad Católica, Santiago, Chile May 2015
12. Talk, Midwest Magnetic Fields Workshop, Madison, Wisconsin May 2015
11. Invited Talk, PPPL Theory Seminar, Princeton, New Jersey Dec. 2014
10. Poster, NSF Directorate for Mathematical & Physical Sciences, New York, New York Oct. 2014
9. Poster, Filamentary Structure in Molecular Clouds, NRAO, Charlottesville, Virginia Oct. 2014
8. Invited Talk, Non-Ideal MHD, Stability, and Dissipation in PPDs, Copenhagen, Denmark Aug. 2014
7. Poster, Galactic Science with the SKA and its Pathfinders, Leiden, Netherlands May 2014
6. Talk, Midwest Magnetic Fields Workshop, Madison, Wisconsin Apr. 2014
5. Talk, Phases of the ISM Conference, Heidelberg, Germany July 2013
4. Talk, Senior Research Symposium, Chapel Hill, North Carolina Apr. 2012
3. Poster, AAS Winter Meeting, Austin, Texas Jan. 2012
2. Talk, GALFA-HI Collaboration Meeting, Madison, Wisconsin Aug. 2011
1. Talk, REU Symposium, Arecibo Observatory, Puerto Rico Aug. 2011

## TEACHING EXPERIENCE

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|---|-------------|
| Team Leader, Instructor, Introduction to Astrophysics, Wagner Youth Correctional Facility | 2019        |
| Instructor, Introduction to Astrophysics, East Jersey State Prison                        | 2018        |
| Guest Lecturer, Columbia University, upper-level undergraduate Galaxies course            | 2017        |
| Head Teaching Assistant, Columbia Department of Astronomy                                 | 2015 – 2016 |
| Guest Lecturer, Hunter College, Unsolved Problems in Astrophysics                         | 2016        |
| Grader, Columbia University, Life in the Universe   | 2014        |
| Instructor, Columbia University, Observational Astronomy Lab                              | 2014        |
| Instructor, Columbia University, Earth, Moon, & Planets Lab                               | 2013        |
| Grader, Columbia University, Life in the Universe   | 2013        |
| Teaching Assistant, Columbia University, Galaxies & Cosmology                             | 2013        |

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|---|-------------|
| Teaching Assistant, Columbia University, Stars & Atoms                  | 2012        |
| Instructor, UNC-Chapel Hill, Physics Help Center                        | 2011 – 2012 |
| Teaching Assistant, UNC-Chapel Hill, Calculus-Based Newtonian Mechanics | 2011        |

## STUDENTS ADVISED

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|  |                |
|--|----------------|
| Doyeon Avery Kim, Columbia University, graduate student                    | 2018 – present |
| Jessica Campbell, University of Toronto, PhD coadviser with Bryan Gaensler | 2017 – present |
| Larry Li, Columbia University, undergraduate research                      | 2016 – present |
| Garrison Grogan, Columbia University, undergraduate research               | 2016 – 2017    |
| Lowell Schudel, Columbia University, undergraduate research                | 2014 – 2015    |

## PROFESSIONAL ACTIVITIES

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| Simons Observatory Galactic Science Working Group Co-Leader  | 2019–present |
| Member Representative, IAS Diversity Committee   | 2018–present |
| SOC, Warm Ionized Medium in Galaxies, Green Bank, West Virginia  | 2019         |
| Organizer, IAS Informal Seminar  | 2018–2019    |
| Organizer, <a href="#">The Milky Way in the Age of Gaia</a> , Paris  | 2018         |
| Organizer, <a href="#">The Interstellar Medium Beyond 3D</a> , Paris   | 2017         |
| Organizer, Columbia University Weekly Astro-ph Discussion  | 2016 – 2017  |
| Referee, <i>The Astrophysical Journal</i> , <i>The Astrophysical Journal Letters</i> , <i>Astronomy &amp; Astrophysics</i> |              |

## SELECTED OUTREACH AND SERVICE

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| Team Leader, Instructor, <a href="#">Prison Teaching Initiative</a>                         | 2018 – present |
| Public Talk, Astronomy on Tap, Trenton, New Jersey  | 2019           |
| Volunteer, <a href="#">Reading Team Math Program</a> , Harlem, New York                     | 2016 – 2017    |
| Instructor, <a href="#">Rooftop Variables</a> , Curtis High School, Staten Island, New York | 2012 – 2017    |
| Outreach Volunteer, bi-weekly community stargazing, Columbia University                     | 2012 – 2017    |
| Public Lecture, <i>Our Magnetic Universe</i> , Columbia Astronomy Outreach Lecture Series   | 2015           |
| Founder, President, UNC-Chapel Hill Women in Physics  | 2010 – 2012    |
| Member, Social Chair, UNC-Chapel Hill Society of Physics Students                           | 2010 – 2012    |
| Chapter Director, Mentor, UNC-Chapel Hill <a href="#">Strive For College</a>                | 2009 – 2012    |

## OTHER PUBLISHED WRITING

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- [Interstellar Magnetism](#), **S.E. Clark**, article, The Institute Letter, Spring 2019
- Closing My Eyes*, **S.E. Clark**, personal essay, The Washington Post Magazine, May 2009