

EVAN J. ARENA

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RESEARCH INTERESTS

Theoretical astrophysics and cosmology, including general relativity, gravitational lensing, modified gravity, large-scale structure, 21 cm cosmology, dark energy, inflation, dark matter, radio astronomy, and gravitational waves.

EDUCATION

Drexel University Ph.D. Student of Physics	2018 – Present
Stony Brook University B.S. in Physics and Astronomy/Planetary Sciences <i>Cum Laude</i> <i>Departmental Honors in Physics</i>	2013 – 2017

POSITIONS HELD

Drexel University <i>Graduate Research Assistant and CoAS Dean's Fellow</i> Department of Physics	2018 – Present
Stony Brook University and Brookhaven National Laboratory <i>Research Assistant</i> SBU Department of Physics & Astronomy and BNL Department of Physics	2015 – Present
Brookhaven National Laboratory <i>Intern</i> Department of Physics	2012 – 2013

AWARDS AND HONORS

<i>College of Arts and Sciences (CoAS) Dean's Fellowship</i> , Drexel University	2018
<i>Sigma Pi Sigma National Physics Honor Society Member</i> , Stony Brook University	2017
<i>Presidential Scholarship</i> , Stony Brook University	2013

RESEARCH HISTORY

2018 – Present	Gravitational Lensing Study of the second-order weak gravitational lensing effect known as Flexion.
2015 – Present	Low redshift 21 cm intensity mapping Cosmological parameter and modified gravity forecasts for a general 21 cm cosmology experiment, member of the DOE Cosmic Visions Dark Energy 21 cm Working Group, and design and construction of the radio telescope used for the 21 cm Baryon Mapping eXperiment at Brookhaven National Laboratory.
2013	Gravitational Waves Proposed a new method for the indirect detection of gravitational waves via precision stellar redshift measurement.

Investigated the plausibility of Modified Newtonian Dynamics on a local scale based on rotation curves of the Milky Way.

PROFESSIONAL ACTIVITIES AND SERVICE

Working Groups	Member of the DOE Cosmic Visions Dark Energy 21 cm Working Group
Collaborations	Member of the Large Synoptic Survey Telescope Dark Energy Science Collaboration (LSST-DESC)

TEACHING

Drexel University

Teaching Assistant

PHYS 154, <i>Introductory Physics III</i> (Recitation Instructor)	Fall 2019
PHYS 152, <i>Introductory Physics I</i> (Recitation Instructor)	Spring 2019
PHYS 100, <i>Preparation for Engineering Studies</i> (Recitation Instructor)	Winter 2019
PHYS 154, <i>Introductory Physics III</i> (Recitation and Lab Instructor)	Fall 2018

Stony Brook University

Lecturer

Della Pietra High School Applied Math Program	Spring 2017
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TALKS AND PRESENTATIONS

“Observation of gravitational waves through precision stellar redshift measurement” High School Research Program conference, Brookhaven National Laboratory	August 2013
“Dark Matter and its alternatives” (Poster) High School Research Program poster session, Brookhaven National Laboratory	September 2012

PUBLICATIONS

1. Ahmed, Z., Alonso, D., Amin, M. A., Ansari, R., **Arena, E. J.**, Bandura, K., Battaglia, N., Blazek, J., Bull, P., Castorina, E., Chang, T.-C., Connor, L., Davé, R., Dillon, J. S., Dvorkin, C., van Engelen, A., Ferraro, S., Flauger, R., Foreman, S., Frisch, J., Green, D., Holder, G., Jacobs, D., Johnson, M. C., Karagiannis, D., Kaurov, A. A., Knox, L., Liu, A., Loverde, M., Ma, Y.-Z., Masui, K. W., McClintock, T., Meerburg, P. D., Moodley, K., Münchmeyer, M., Newburgh, L. B., Ng, C., Nomerotski, A., O'Connor, P., Obuljen, A., Padmanabhan, H., Parkinson, D., Prochaska, J. X., Rajendran, S., Rapetti, D., Saliwanchik, B., Schaan, E., Sehgal, N., Shaw, J. R., Sheehy, C., Sheldon, E., Shirley, R., Silverstein, E., Slatyer, T., Slosar, A., Stankus, P., Stebbins, A., Timbie, P., Tucker, G. S., Tyndall, W., Villaescusa-Navarro, F., Wallisch, B., and White, M., “*Packed Ultra-wideband Mapping Array (PUMA): A Radio Telescope for Cosmology and Transients*”, ArXiv e-prints (2019) [[arXiv:1907.12559](https://arxiv.org/abs/1907.12559)]
2. Ahmed, Z., Alonso, D., Amin, M. A., Ansari, R., **Arena, E. J.**, Bandura, K., Beardsley, A., Bull, P., Castorina, E., Chang, T.-C., Davé, R., Dillon, J. S., van Engelen, A., Ewall-Wice, A., Ferraro, S., Foreman, S., Frisch, J., Green, D., Holder, G., Jacobs, D., Karagiannis, D., Kaurov, A. A., Knox, L., Kuhn, E., Liu, A., Ma, Y.-Z., Masui, K. W., McClintock, T., Moodley, K., Münchmeyer, M., Newburgh, L. B., Nomerotski, A., O'Connor, P., Obuljen, A., Padmanabhan, H., Parkinson, D., Perdureau, O., Rapetti, D., Saliwanchik, B., Sehgal, N., Shaw, J. R., Sheehy, C., Sheldon, E., Shirley, R., Silverstein, E., Slatyer, T., Slosar, A., Stankus, P., Stebbins, A., Timbie, P., Tucker, G. S., Tyndall, W., Villaescusa-Navarro, F., and Wulf, D., “*Research and Development for HI Intensity Mapping*”, ArXiv e-prints (2019) [[arXiv:1907.13090](https://arxiv.org/abs/1907.13090)]

3. Cosmic Visions 21 cm Collaboration, Ansari, R., **Arena, E. J.** , Bandura, K., Bull, P., Castorina, E., Chang, T.-C., Foreman, S., Frisch, J., Green, D., Karagiannis, D., Liu, A., Masui, K. W., Meerburg, P. D., Newburgh, L. B., Obuljen, A., O'Connor, P., Shaw, J. R., Sheehy, C., Slosar, A., Smith, K., Stankus, P., Stebbins, A., Timbie, P., Villaescusa-Navarro, F., and White, M., *“Inflation and Early Dark Energy with a Stage II Hydrogen Intensity Mapping experiment”*, ArXiv e-prints (2018) [[arXiv:1810.09572](#)]