EVAN J. ARENA

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RESEARCH INTERESTS

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

EDUCATION

Drexel University 2018 – Present
Ph.D. Student of Physics

Stony Brook University 2013 – 2017
B.S. in Physics and Astronomy/Planetary Sciences
Cum Laude
Departmental Honors in Physics

POSITIONS HELD

Drexel University 2018 – Present
Graduate Research Assistant and CoAS Dean's Fellow
Department of Physics

Stony Brook University and Brookhaven National Laboratory 2015 – Present
Research Assistant
SBU Department of Physics & Astronomy and BNL Department of Physics

Brookhaven National Laboratory 2012 – 2013
Intern
Department of Physics

AWARDS AND HONORS

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

2012 **Modified Newtonian Dynamics**
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 152, *Introductory Physics I* (Recitation Instructor) Spring 2019
PHYS 100, *Preparation for Engineering Studies* (Recitation Instructor) Winter 2019
PHYS 154, *Introductory Physics III* (Recitation and Lab Instructor) Fall 2018

Stony Brook University
Lecturer
Della Pietra High School Applied Math Program Spring 2017

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]

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., Perdereau, 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]

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]