EVAN J. ARENA

Ph.D. Student \diamond Deptartment of Physics \diamond Drexel University Disque Hall, Office No. 808 \disks 32 S. 32nd St. \disks Philadelphia, PA 19104, USA $+1 \cdot (516) \cdot 383 \cdot 4817 \diamond \text{evan.james.arena@drexel.edu}$

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.

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EDUCATION	
Drexel University Ph.D. Student of Physics	2018 – Present
Stony Brook University B.S. in Physics and Astronomy/Planetary Sciences Cum Laude Departmental Honors in Physics POSITIONS HELD	2013 - 2017
Drexel University Graduate Research Assistant and CoAS Dean's Fellow Department of Physics	2018 – Present

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

Sigma Xi Scientific Research Honor Society Member, Drexel University	2019
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 Collabo-

ration (LSST-DESC)

TEACHING

Drexel University

Teaching Assistant (Recitation and Lab Instructor)

PHYS 100, Preparation for Engineering Studies

PHYS 152, Introductory Physics I

PHYS 154, Introductory Physics III

Winter 2020, Winter 2019

Spring 2019

Fall 2019, Fall 2018

Stony Brook University

Lecturer

Della Pietra High School Applied Math Program

Spring 2017

CONFERENCES AND TALKS

Contributed Talks

"Hybrid analytic image modeling and image moments approach to gravitational lensing"

Research talk to incoming graduate students, Drexel University

17 Sep. 2019

"Observation of gravitational waves through precision stellar redshift measurement"

High School Research Program conference, Brookhaven National Laboratory

16 Aug. 2013

Poster Presentations

"Hybrid analytic image modeling and image moments approach to gravitational lensing"

First-year graduate student presentations, Drexel University

11 Jun. 2019

"Dark matter and its alternatives"

High School Research Program conference, Brookhaven National Laboratory

27 Nov. 2012

PUBLICATIONS

- 3. 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]
- 1. 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]