



## Steven Allen

Professor of Physics and of Particle Physics and Astrophysics

### Bio

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#### BIO

Steve Allen leads the X-ray Astronomy and Observational Cosmology (XOC) group (<https://xoc.stanford.edu/>) at Stanford, which has interests spanning the astrophysics of galaxies and galaxy clusters, studies of dark matter and dark energy, and the development of advanced detectors for future satellite missions.

#### ACADEMIC APPOINTMENTS

- Professor, Physics
- Professor, Particle Physics and Astrophysics

#### ADMINISTRATIVE APPOINTMENTS

- Department Head, LSST Science Department, SLAC National Accelerator Laboratory, (2014- present)
- Department Head, Department of Observational and Experimental Cosmology, SLAC National Accelerator Laboratory, (2005-2014)

#### HONORS AND AWARDS

- Sophie and Tycho Brahe Visiting Professorship, University of Copenhagen (2012)
- Bruno Rossi Prize, American Astronomical Society (2008)
- Royal Society University Research Fellowship, Royal Society (1999)
- Charles and Katherine Darwin Research Fellowship, Darwin College, Cambridge (1995)
- Postdoctoral Research Fellowship, UK Science and Engineering Research Council (1993)

#### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Physical Society (2018 - present)
- Member, Lynx Science and Technology Definition Team (2016 - present)
- Member, Athena Wide Field Imager Consortium (2016 - present)
- Chair, LSST Steering Committee, SLAC (2014 - present)
- Member, Athena Science Study Team (2014 - present)
- Member, American Astronomical Society (AAS) (2006 - present)
- Associate, Dark Cosmology Center, Copenhagen (2005 - present)
- Member, Kavli Institute for Particle Astrophysics and Cosmology (2005 - present)
- Member, Institute of Physics (1993 - present)
- Member, Royal College of Science Association (1990 - present)

- DOE Point of Contact, LSST Dark Energy Science Collaboration (2015 - 2019)
- Co-chair, Clusters Working Group, LSST Dark Energy Science Collaboration (2012 - 2017)
- Member, High Energy Astrophysics Division Nomination Committee, NASA (2011 - 2012)
- Co-chair, Astro-H Cosmology Science Working Group (2010 - 2017)
- Member, Science Definition Team, International X-ray Observatory (2008 - 2011)
- Member, Chandra Users' Committee, Chandra X-ray Observatory (2008 - 2011)
- Chair, Constellation-X Large Scale Structure panel, NASA (2007 - 2008)
- Member, KIPAC Executive Committee (2006 - 2014)
- Member, Constellation-X Facility Science Team, NASA (2004 - 2008)
- Member, Constellation-X Galaxy Clusters Science panel, NASA (2004 - 2008)
- Member, Governing Body, Darwin College, Cambridge (1996 - 1999)

## PROFESSIONAL EDUCATION

- B. Sc., Imperial College, University of London. , Physics (1990)
- Ph.D., University of Cambridge. , Astronomy (1995)

## LINKS

- My research group: <https://web.stanford.edu/group/xoc/>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Observational astrophysics and cosmology; galaxies, galaxy clusters, dark matter and dark energy; applications of statistical methods; X-ray astronomy; X-ray detector development; optical astronomy; mm-wave astronomy; radio astronomy; gravitational lensing.

## Teaching

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### COURSES

#### 2023-24

- Graduate Observational Astrophysics: PHYSICS 301 (Spr)
- Introduction to Observational Astrophysics: PHYSICS 100 (Spr)

#### 2022-23

- Introduction to Observational Astrophysics: PHYSICS 100 (Spr)

#### 2021-22

- Astrophysics Laboratory: PHYSICS 301 (Spr)
- Introduction to Observational Astrophysics: PHYSICS 100 (Spr)

#### 2020-21

- Introduction to Observational Astrophysics: PHYSICS 100 (Spr)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Elise Darragh-Ford, Jamie McCullough, Josephine Wong

#### Postdoctoral Faculty Sponsor

Sanskriti Das, Artem Poliszczuk, Zhefu Yu

#### Doctoral Dissertation Advisor (AC)

Anthony Flores, Haley Stueber, Chloe Taylor

#### Doctoral (Program)

Mahiro Abe, James Allen, Drew Ames, Sanha Cheong, Jason Corbin, Kevin Feigelis, Fangze Liu, Tom Liu, Jamie McCullough, Yuka Nakato, Theo Schutt, Bahrudin Trbalic

## Publications

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### PUBLICATIONS

- **Improved noise performance from the next-generation buried-channel p-MOSFET SiSeROs** *JOURNAL OF ASTRONOMICAL TELESCOPES INSTRUMENTS AND SYSTEMS*  
Chattopadhyay, T., Herrmann, S., Kaplan, M., Orel, P., Donlon, K., Prigozhin, G., Morris, G., Cooper, M., Malonis, A., Allen, S. W., Bautz, M. W., Leitz, C.  
2023; 9 (2)
- **SPT-CL J2215-3537: A Massive Starburst at the Center of the Most Distant Relaxed Galaxy Cluster** *ASTROPHYSICAL JOURNAL*  
Calzadilla, M. E., Bleem, L., McDonald, M. D., Gladders, M. B., Mantz, A. W., Allen, S. B., Bayliss, M., Eilers, A., Floyd, B., Hlavacek-Larrondo, J., Khullar, G. J., Kim, K., Mahler, et al  
2023; 947 (2)
- **The Concentration-Mass relation of massive, dynamically relaxed galaxy clusters: agreement between observations and  $\Lambda$ CDM simulations** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Darragh-Ford, E., Mantz, A. B., Rasia, E., Allen, S. W., Morris, R., Foster, J., Schmidt, R. W., Wenrich, G.  
2023; 521 (1): 790-799
- **The Evolution and Mass Dependence of Galaxy Cluster Pressure Profiles at  $0.05 \leq z \leq 0.60$  and  $4 \times 10^{14} M_{\odot} \leq M(500) \leq 30 \times 10^{14} M_{\odot}$**  *ASTROPHYSICAL JOURNAL*  
Sayers, J., Mantz, A. B., Rasia, E., Allen, S. W., Cui, W., Golwala, S. R., Morris, R., Wan, J. T.  
2023; 944 (2)
- **Chandra measurements of gas homogeneity and turbulence at intermediate radii in the Perseus Cluster** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
de Vries, M., Mantz, A. B., Allen, S. W., Morris, R., Zhuravleva, I., Canning, R. A., Ehlert, S. R., Ogorzalek, A., Simionescu, A., Werner, N.  
2023; 518 (2): 2954-2970
- **BASS-XXXVI. Constraining the Local Supermassive Black Hole-Halo Connection with BASS DR2 AGNs** *ASTROPHYSICAL JOURNAL*  
Powell, M. C., Allen, S. W., Caglar, T., Cappelluti, N., Harrison, F., Irving, B. E., Koss, M. J., Mantz, A. B., Oh, K., Ricci, C., Shaper, R. J., Stern, D., Trakhtenbrot, et al  
2022; 938 (1)
- **X-ray morphology of cluster-mass haloes in self-interacting dark matter** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Shen, X., Brinckmann, T., Rapetti, D., Vogelsberger, M., Mantz, A., Zavala, J., Allen, S. W.  
2022; 516 (1): 1302-1319
- **CMB-S4: Forecasting Constraints on Primordial Gravitational Waves** *ASTROPHYSICAL JOURNAL*  
Abazajian, K., Addison, G. E., Adshead, P., Ahmed, Z., Akerib, D., Ali, A., Allen, S. W., Alonso, D., Alvarez, M., Amin, M. A., Anderson, A., Arnold, K. S., Ashton, et al  
2022; 926 (1)
- **Cosmological constraints from gas mass fractions of massive, relaxed galaxy clusters** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Mantz, A. B., Morris, R., Allen, S. W., Canning, R. A., Baumont, L., Benson, B., Bleem, L. E., Ehlert, S. R., Floyd, B., Herbonnet, R., Kelly, P. L., Liang, S., von Der Linden, et al  
2022; 510 (1): 131-145
- **Very Large Array Radio Study of a Sample of Nearby X-Ray and Optically Bright Early-type Galaxies** *ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES*  
Grossova, R., Werner, N., Massaro, F., Lakhchaura, K., Plsek, T., Gabanyi, K., Rajpurohit, K., Canning, R. A., Nulsen, P., O'Sullivan, E., Allen, S. W., Fabian, A.

2022; 258 (2)

- **Towards precision particle background estimation for future X-ray missions: correlated variability between Chandra ACIS and AMS**  
Grant, C. E., Miller, E. D., Bautz, M. W., Foster, R., Kraft, R. P., Allen, S., Burrows, D. N., DenHerder, J. W., Nikzad, S., Nakazawa, K.  
SPIE-INT SOC OPTICAL ENGINEERING.2022
- **Development and characterization of a fast and low noise readout for the next generation x-ray charge-coupled devices** *Journal of Astronomical Telescopes, Instruments, and Systems*  
Chattopadhyay, T., et al  
2022; 8 (2): 12
- **First results on SiSeRO devices: a new x-ray detector for scientific instrumentation** *Journal of Astronomical Telescopes, Instruments, and Systems*  
Chattopadhyay, T., et al  
2022; 8 (2): 12
- **Single electron Sensitive Readout (SiSeRO) X-ray detectors: Technological progress and characterization**  
Chattopadhyay, T., Herrmann, S., Orel, P., Morris, R. G., Wilkins, D. R., Allen, S. W., Prigozhin, G., LaMarr, B., Malonis, A., Foster, R., Bautz, M. W., Donlon, K., Cooper, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2022
- **X-ray speed reading with the MCRC: a low noise CCD readout ASIC enabling readout speeds of 5 Mpixel/s/channel**  
Orel, P., Herrmann, S., Chattopadhyay, T., Morris, G., Allen, S. W., Prigozhin, G. Y., Foster, R., Malonis, A., Bautz, M. W., Cooper, M. J., Donlon, K., Holland, A. D., Beletic, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2022
- **Mitigating the effects of particle background on the Athena Wide Field Imager** *JOURNAL OF ASTRONOMICAL TELESCOPES INSTRUMENTS AND SYSTEMS*  
Miller, E. D., Grant, C. E., Bautz, M. W., Molendi, S., Kraft, R., Nulsen, P., Bulbul, E., Allen, S., Burrows, D. N., Eraerds, T., Fioretti, V., Gastaldello, F., Hall, et al  
2022; 8 (1)
- **The history of metal enrichment traced by X-ray observations of high-redshift galaxy clusters** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Flores, A. M., Mantz, A. B., Allen, S. W., Morris, R., Canning, R. A., Bleem, L. E., Calzadilla, M. S., Floyd, B. T., McDonald, M., Ruppin, F.  
2021; 507 (4): 5195-5204
- **Quiescent galaxies in a virialized cluster at redshift 2: evidence for accelerated size growth** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Noordeh, E., Canning, R. A., Willis, J. P., Allen, S. W., Mantz, A., Stanford, S. A., Brammer, G.  
2021; 507 (4): 5272-5280
- **Stability of Cool Cores during Galaxy Cluster Growth: A Joint Chandra/SPT Analysis of 67 Galaxy Clusters along a Common Evolutionary Track Spanning 9 Gyr** *ASTROPHYSICAL JOURNAL*  
Ruppin, F., McDonald, M., Bleem, L. E., Allen, S. W., Benson, B. A., Calzadilla, M., Khullar, G., Floyd, B.  
2021; 918 (2)
- **A shock near the virial radius of the Perseus Cluster** *ASTRONOMY & ASTROPHYSICS*  
Zhu, Z., Simionescu, A., Akamatsu, H., Zhang, X., Kaastra, J. S., de Plaa, J., Urban, O., Allen, S. W., Werner, N.  
2021; 652
- **Spectroscopic quantification of projection effects in the SDSS redMaPPer galaxy cluster catalogue** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Myles, J., Gruen, D., Mantz, A. B., Allen, S. W., Morris, R. G., Rykoff, E., Costanzi, M., To, C., DeRose, J., Wechsler, R. H., Rozo, E., Jeltama, T., Carrasco, et al  
2021; 505 (1): 33-44
- **Measuring H-0 using X-ray and SZ effect observations of dynamically relaxed galaxy clusters** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Wan, J. T., Mantz, A. B., Sayers, J., Allen, S. W., Morris, R., Golwala, S. R.  
2021; 504 (1): 1062-1076
- **Reducing the Athena WFI charged particle background: Results from Geant4 simulations**  
Grant, C. E., Miller, E. D., Bautz, M. W., Eraerds, T., Molendi, S., Keelan, J., Hall, D., Holland, A. D., Kraft, R., Bulbul, E., Nulsen, P., Allen, S., DenHerder, et al

SPIE-INT SOC OPTICAL ENGINEERING.2021

- **Identifying charged particle background events in X-ray imaging detectors with novel machine learning algorithms**  
Wilkins, D. R., Allen, S. W., Miller, E. D., Bautz, M., Chattopadhyay, T., Fort, S., Grant, C. E., Herrmann, S., Kraft, R., Morris, R. G., Nulsen, P., DenHerder, J. W., Nikzad, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2021
- **Progress toward fast, low-noise, low-power digital CCDs for Lynx and other high-energy astrophysics missions**  
Bautz, M., Burke, B., Cooper, M., Craig, D., Donlon, K., Foster, R., Grant, C. E., LaMarr, B., Leitz, C., Malonis, A., Miller, E., Prigozhin, G., Thayer, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2021
- **The environmental dependence of X-ray AGN activity at  $z$  similar to 0.4** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Noordeh, E., Canning, R. A., King, A., Allen, S. W., Mantz, A., Morris, R. G., Ehlert, S., von der Linden, A., Brandt, W. N., Luo, B., Xue, Y. Q., Kelly, P.  
2020; 498 (3): 4095-4108
- **A Multiwavelength Study of the Cool Core Cluster MACS J1447.4+0827** *ASTRONOMICAL JOURNAL*  
Prasow-Emond, M., Hlavacek-Larrondo, J., Rhea, C. L., Latulippe, M., Gendron-Marsolais, M., Richard-Laferriere, A., Sanders, J. S., Edge, A. C., Allen, S. W., Mantz, A., von der Linden, A.  
2020; 160 (3)
- **Deep XMM-Newton observations of the most distant SPT-SZ galaxy cluster** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Mantz, A. B., Allen, S. W., Morris, R., Canning, R. A., Bayliss, M., Bleem, L. E., Floyd, B. T., McDonald, M.  
2020; 496 (2): 1554-64
- **Dark Energy Survey Year 1 Results: Cosmological constraints from cluster abundances and weak lensing** *PHYSICAL REVIEW D*  
Abbott, T. C., Aguena, M., Alarcon, A., Allam, S., Allen, S., Annis, J., Avila, S., Bacon, D., Bechtol, K., Bermeo, A., Bernstein, G. M., Bertin, E., Bhargava, et al  
2020; 102 (2)
- **Characterization of the Particle-induced Background of XMM-Newton EPIC-pn: Short- and Long-term Variability** *ASTROPHYSICAL JOURNAL*  
Bulbul, E., Kraft, R., Nulsen, P., Freyberg, M., Miller, E. D., Grant, C., Bautz, M. W., Burrows, D. N., Allen, S., Eraerds, T., Fioretti, V., Gastaldello, F., Ghirardini, et al  
2020; 891 (1)
- **Galaxy Clusters Selected via the Sunyaev-Zel'dovich Effect in the SPTpol 100-square-degree Survey** *ASTRONOMICAL JOURNAL*  
Huang, N., Bleem, L. E., Stalder, B., Ade, P. R., Allen, S. W., Anderson, A. J., Austermann, J. E., Avva, J. S., Beall, J. A., Bender, A. N., Benson, B. A., Bianchini, F., Bocquet, et al  
2020; 159 (3)
- **The SPTpol Extended Cluster Survey** *ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES*  
Bleem, L. E., Bocquet, S., Stalder, B., Gladders, M. D., Ade, P. R., Allen, S. W., Anderson, A. J., Annis, J., Ashby, M. N., Austermann, J. E., Avila, S., Avva, J. S., Bayliss, et al  
2020; 247 (1)
- **An X-ray detection of star formation in a highly magnified giant arc** *NATURE ASTRONOMY*  
Bayliss, M. B., McDonald, M., Sharon, K., Gladders, M. D., Florian, M., Chisholm, J., Dahle, H., Mahler, G., Paterno-Mahler, R., Rigby, J. R., Rivera-Thorsen, E., Whitaker, K. E., Allen, et al  
2020; 4 (2): 159-166
- **Spectroscopic confirmation of a mature galaxy cluster at a redshift of 2** *NATURE*  
Willis, J. P., Canning, R. A., Noordeh, E. S., Allen, S. W., King, A. L., Mantz, A., Morris, R. G., Stanford, S. A., Brammer, G.  
2020; 577 (7788): 39-+
- **MCRC V1: development of integrated readout electronics for next generation X-ray CCD detectors for future satellite observatories** *X-Ray, Optical, and Infrared Detectors for Astronomy*  
Herrmann, S., Wong, J., Chattopadhyay, T., Morris, R. G., Burke, B., Prigozhin, G., Cooper, M., Craig, D., Donlon, K., Foster, R., Malonis, A., Bautz, M., Allen, et al  
2020
- **Tiny-box: a tool for the versatile development and characterization of low noise fast x-ray imaging detectors** *X-Ray, Optical, and Infrared Detectors for Astronomy*  
Chattopadhyay, T., Herrmann, S., Allen, S., Hirschman, J., Morris, G., Bautz, M., Malonis, A., Foster, R., Prigozhin, G., Craig, D., Burke, B.

2020

- **Ellipticity of brightest cluster galaxies as tracer of halo orientation and weak-lensing mass bias** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Herbonnet, R., von der Linden, A., Allen, S. W., Mantz, A. B., Modumudi, P., Morris, R., Kelly, P. L.  
2019; 490 (4): 4889–97
- **Phenotypic redshifts with self-organizing maps: A novel method to characterize redshift distributions of source galaxies for weak lensing** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Buchs, R., Davis, C., Gruen, D., DeRose, J., Alarcon, A., Bernstein, G. M., Sanchez, C., Myles, J., Roodman, A., Allen, S., Amon, A., Choi, A., Masters, et al  
2019; 489 (1): 820-841
- **Methods for cluster cosmology and application to the SDSS in preparation for DES Year 1 release** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Costanzi, M., Rozo, E., Simet, M., Zhang, Y., Evrard, A. E., Mantz, A., Rykoff, E. S., Jeltema, T., Gruen, D., Allen, S., McClintock, T., Romer, A. K., von der Linden, et al  
2019; 488 (4): 4779-4800
- **Powerful AGN jets and unbalanced cooling in the hot atmosphere of IC 4296** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Grossova, R., Werner, N., Rajpurohit, K., Mernier, F., Lakhchaura, K., Gabanyi, K., Canning, R. A., Nulsen, P., Massaro, F., Sun, M., Connor, T., King, A., Allen, et al  
2019; 488 (2): 1917-1925
- **Suppressed effective viscosity in the bulk intergalactic plasma** *NATURE ASTRONOMY*  
Zhuravleva, Churazov, E., Schekochihin, A. A., Allen, S. W., Vikhlinin, A., Werner, N.  
2019; 3 (9): 832-837
- **Dark Energy Surveyed Year 1 results: calibration of cluster mis-centring in the redMaPPer catalogues** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Zhang, Y., Jeltema, T., Hollowood, D. L., Everett, S., Rozo, E., Farahi, A., Bermeo, A., Bhargava, S., Giles, P., Romer, A. K., Wilkinson, R., Rykoff, E. S., Mantz, et al  
2019; 487 (2): 2578-2593
- **Magnetic fields and extraordinarily bright radio emission in the X-ray faint galaxy group MRC 0116+111** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Mernier, F., Werner, N., Bagchi, J., Simionescu, A., Boehringer, H., Allen, S. W., Jacob, J.  
2019; 486 (4): 5430-5440
- **Cluster Cosmology Constraints from the 2500 deg<sup>2</sup> SPT-SZ Survey: Inclusion of Weak Gravitational Lensing Data from Magellan and the Hubble Space Telescope** *ASTROPHYSICAL JOURNAL*  
Bocquet, S., Dietrich, J. P., Schrabback, T., Bleem, L. E., Klein, M., Allen, S. W., Applegate, D. E., Ashby, M. N., Bautz, M., Bayliss, M., Benson, B. A., Brodwin, M., Bulbul, et al  
2019; 878 (1)
- **Cooling in the X-ray halo of the rotating, massive early-type galaxy NGC 7049** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Juranova, A., Werner, N., Gaspari, M., Lakhchaura, K., Nulsen, P. J., Sun, M., Canning, R. A., Allen, S. W., Simionescu, A., Oonk, J. R., Connor, T., Donahue, M.  
2019; 484 (2): 2886-2895
- **Sunyaev-Zel'dovich effect and X-ray scaling relations from weak lensing mass calibration of 32 South Pole Telescope selected galaxy clusters** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Dietrich, J. P., Bocquet, S., Schrabback, T., Applegate, D., Hoekstra, H., Grandis, S., Mohr, J. J., Allen, S. W., Bayliss, M. B., Benson, B. A., Bleem, L. E., Brodwin, M., Bulbul, et al  
2019; 483 (3): 2871-2906
- **A Detailed Study of the Most Relaxed SPT-selected Galaxy Clusters: Properties of the Cool Core and Central Galaxy** *ASTROPHYSICAL JOURNAL*  
McDonald, M., Allen, S. W., Hlavacek-Larrondo, J., Mantz, A. B., Bayliss, M., Benson, B. A., Brodwin, M., Bulbul, E., Canning, R. A., Chiu, Forman, W. R., Garmire, G. P., Gupta, N., et al  
2019; 870 (2)
- **US Contributions to the Athena Wide Field Imager**  
Burrows, D. N., Allen, S., Bautz, M., Bulbul, E., Chattopadhyay, T., Erdley, J., Falcone, A. D., Grant, C. E., Herrmann, S., Hornschemeier, A., Kelly, D., Kennea, J., Kraft, et al

SPIE-INT SOC OPTICAL ENGINEERING.2019

- **Spectroscopic Confirmation of Five Galaxy Clusters at  $z > 1.25$  in the 2500 deg<sup>2</sup> SPT-SZ Survey** *ASTROPHYSICAL JOURNAL*  
Khullar, G., Bleem, L. E., Bayliss, M. B., Gladders, M. D., Benson, B. A., McDonald, M., Allen, S. W., Applegate, D. E., Ashby, M. N., Bocquet, S., Brodwin, M., Bulbul, E., Canning, et al  
2019; 870 (1)
- **Dark Energy Survey Year 1 results: weak lensing mass calibration of redMaPPer galaxy clusters** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
McClintock, T., Varga, T. N., Gruen, D., Rozo, E., Rykoff, E. S., Shin, T., Melchior, P., DeRose, J., Seitz, S., Dietrich, J. P., Sheldon, E., Zhang, Y., von der Linden, et al  
2019; 482 (1): 1352–78
- **Detection of polarized gamma-ray emission from the Crab nebula with the Hitomi Soft Gamma-ray Detector** *PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF JAPAN*  
Aharonian, F., Akamatsu, H., Akimoto, F., Allen, S. W., Angelini, L., Audard, M., Awaki, H., Axelsson, M., Bamba, A., Bautz, M. W., Blandford, R., Brenneman, L. W., Brown, et al  
2018; 70 (6)
- **Thermodynamic properties, multiphase gas, and AGN feedback in a large sample of giant ellipticals** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
Lakhchaura, K., Werner, N., Sun, M., Canning, R. A., Gaspari, M., Allen, S. W., Connor, T., Donahue, M., Sarazin, C.  
2018; 481 (4): 4472-4504
- **The XXL Survey XVII. X-ray and Sunyaev-Zel'dovich properties of the redshift 2.0 galaxy cluster XLSSC 122** *ASTRONOMY & ASTROPHYSICS*  
Mantz, A. B., Abdulla, Z., Allen, S. W., Carlstrom, J. E., Logan, C. A., Marrone, D. P., Maughan, B. J., Willis, J., Pacaud, F., Pierre, M.  
2018; 620
- **Gas Perturbations in the Cool Cores of Galaxy Clusters: Effective Equation of State, Velocity Power Spectra, and Turbulent Heating** *ASTROPHYSICAL JOURNAL*  
Zhuravleva, I., Allen, S. W., Mantz, A., Werner, N.  
2018; 865 (1)
- **Dark Energy Survey year 1 results: Cosmological constraints from galaxy clustering and weak lensing** *PHYSICAL REVIEW D*  
Abbott, T. C., Abdalla, F. B., Alarcon, A., Aleksic, J., Allam, S., Allen, S., Amara, A., Annis, J., Asorey, J., Avila, S., Bacon, D., Balbinot, E., Banerji, et al  
2018; 98 (4)
- **Hitomi X-ray observation of the pulsar wind nebula G21.5-0.9** *PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF JAPAN*  
Aharonian, F., Akamatsu, H., Akimoto, F., Allen, S. W., Angelini, L., Audard, M., Awaki, H., Axelsson, M., Bamba, A., Bautz, M. W., Blandford, R., Brenneman, L. W., Brown, et al  
2018; 70 (3)
- **Hitomi X-ray studies of Giant Radio Pulses from the Crab pulsar.** *Publications of the Astronomical Society of Japan. Nihon Tenmon Gakkai*  
Aharonian, F., Akamatsu, H., Akimoto, F., Allen, S. W., Angelini, L., Audard, M., Awaki, H., Axelsson, M., Bamba, A., Bautz, M. W., Blandford, R., Brenneman, L. W., Brown, et al  
2018; 70 (2)
- **Hitomi (ASTRO-H) X-ray Astronomy Satellite** *JOURNAL OF ASTRONOMICAL TELESCOPES INSTRUMENTS AND SYSTEMS*  
Takahashi, T., Kokubun, M., Mitsuda, K., Kelley, R. L., Ohashi, T., Aharonian, F., Akamatsu, H., Akimoto, F., Allen, S. W., Anabuki, N., Angelini, L., Arnaud, K., Asai, et al  
2018; 4 (2)
- **ALMA observation of the disruption of molecular gas in M87** *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY*  
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