Ryan L. Sanders, Ph.D.

Curriculum Vitae

Department of Physics and Astronomy
University of California, Davis
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Scientific Research Interests

- Studying galaxy formation and evolution using multi-wavelength imaging and spectroscopy
- Gaseous and stellar chemical abundances and galaxy chemical evolution
- The cycle of baryons; the nature of feedback and the connection between outflows and galaxy growth
- The evolution of the physical conditions and structure of the ionized ISM
- Nebular astrophysics and diagnostics of ionized gas properties; photoionization modeling
- The ionizing spectra of massive stars and the role of star-forming galaxies in reionization

Summary

- 8 1st author papers with 485 citations; 176 citations to Sanders+2015; 140 citations to Sanders+2016a
- >60 nights of observing experience with optical/near-infrared imaging and spectroscopy
- 9 invited talks, including 6 international conferences
- Research mentor for 5 undergraduate and graduate students

Education

University of California, Los Angeles, Department of Physics & Astronomy
Ph.D., Astronomy 2018
M.S., Astronomy 2014
Thesis: "Evolution in the Physical Conditions of Star-Forming Regions Throughout Cosmic History"
Advisor: Prof. Alice Shapley

University of Louisville, Department of Physics & Astronomy
B.S., Physics, conc. in Astronomy and Astrophysics, Summa Cum Laude 2012

Research Experience

NHFP Hubble Fellow, University of California, Davis 2020-present

Postdoctoral Scholar, University of California, Davis 2018-2020
Mentor: Prof. Tucker Jones

Graduate Student Researcher, University of California, Los Angeles 2013-2018
Advisor: Prof. Alice Shapley

Graduate Student Researcher, University of California, Los Angeles 2012
Advisor: Prof. Rene Ong

Undergraduate research assistant (Summer REU), University of Wisconsin, Madison 2011
Advisors: Drs. Eric Hooper and Marsha Wolf

Undergraduate research assistant, University of Louisville 2010-2012
Advisor: Prof. David Brown

Teaching and Mentoring Experience

Co-advisor for 2 graduate and 3undergraduate student researchers

Teaching Assistant, University of California, Los Angeles 2012, 2013, 2017
ASTR 3 "Introduction to Astronomy"

PROPOSALS AND OBSERVING EXPERIENCE

PI Proposals:

- ALMA Cycle 6 Project 2018.1.01128.S — awarded 22 hours
  "A unique test of the high-redshift baryon cycle: connecting molecular gas content and metallicity at z~2" Measuring CO emission lines of z~2 star-forming galaxies.
- Keck: "Completing the census of galaxy metallicities over the past 12 Gyr" — awarded 1.5 nights
  Spectroscopy of z~1.5 galaxies with Keck/DEIMOS and Keck/MOSFIRE in 2020. Submitted by T. Jones on behalf of RLS. Ongoing program.

Major CoI contributor/analysis lead on the following proposals:

- "Accurate chemical abundance measurements: from z=0 to the reionization epoch" (PI: T. Jones) Awarded 14 hours on SOFIA in 2019 and 2020. Ongoing program.
- "The first direct metallicity calibration at cosmic noon" (PI: A. Shapley) Awarded a total of 6 nights on Keck/MOSFIRE over 2018-2020. Ongoing program.
- "MOSDEF-3D: OSIRIS maps of the ionized ISM in z~2 galaxies" (PI: A. Shapley) Awarded a total of 10 nights on Keck/OSIRIS over 2016-2019.

CoI on additional successful proposals awarded a total of 40 Keck nights, 15 HST orbits, and 38 ALMA hours.

Extensive optical and near-infrared observing experience:

- W. M. Keck Observatory, 10 m Keck telescopes — >45 nights
  Instruments: MOSFIRE (multi-object near-infrared spectroscopy, near-infrared imaging)
  OSIRIS (near-infrared integral field spectroscopy)
  LRIS (multi-object optical spectroscopy)
  NIRES (near-infrared spectroscopy)
  KCWI (optical integral field spectroscopy)
- Kitt Peak National Observatory, 3.5 m WIYN telescope — 2 nights
  Instrument: Sparsepak IFU/Bench Spectrograph (optical integral field spectroscopy)
- Lick Observatory, 1 m Nickel telescope — 10 nights
  Instrument: Direct Imaging Camera (optical direct imaging)
- Kitt Peak National Observatory, 0.9 WIYN m telescope — 4 nights
  Instrument: SB2K (optical direct imaging)

TALKS AND PRESENTATIONS

Invited talks (9):

European Astronomical Soceity 2020 Meeting, Leiden, Netherlands — March 2020
- Invited review of gas-phase abundances in the high-redshift universe.

Revolutionary Spectroscopy of Today as a Springboard to Webb, Leiden, Netherlands — October 2019
- Invited review of rest-frame optical studies of high-redshift galaxies.

Metals in Galaxies Near and Far, Leiden, Netherlands — May 2019
The Growth of Galaxies in the Early Universe-V, Sesto, Italy — January 2019
The Art of Measuring Physical Parameters in Galaxies, University of California, Riverside, CA — April 2018
Cosmology Seminar, University of California, Davis, CA — February 2018
Astronomy Seminar, Texas A&M University, College Station, TX — January 2018
In Situ View of Galaxy Formation, Schloss Ringberg, Germany — November 2016
Vth Science with GTC Conference, Puebla, Mexico — December 2015

Contributed talks (12) and posters (3):

Conference Talk: *The Rise of Metals and Dust in Galaxies,* Marseille, France — October 2020
Conference Talk: *SAZERAC*, virtual conference — July 2020
TUNA Lunch Talk, NRAO and University of Virginia, Charlottesville, VA — February 2020

Conference Talk: *Extremely Big Eyes on the Early Universe*, UCLA, Los Angeles, CA — January 2019
Dissertation Talk: *231st Meeting of the AAS*, Washington, D.C. — January 2018
Exgal Seminar, University of Texas, Austin, TX — November 2017
Astronomy Tea Talk, California Institute of Technology, Pasadena, CA — October 2017
Lunch Talk Series, Carnegie Observatories, Pasadena, CA — October 2017
Conference Talk: *Emission Line Galaxies with MOS*, Cambridge, U.K. — October 2017
NOAO Flash Talk, Tucson, AZ — September 2017
Conference Talk: *The Galaxy Lifecycle*, Venice, Italy — October 2016
Conference Talk: *Keck Science Meeting*, UCLA, Los Angeles, CA — September 2015
Poster: *International Astronomical Union Symposium 319*, Honolulu, HI — August 2015
Poster: *Keck Science Meeting*, California Institute of Technology, Pasadena, CA — October 2014
Poster: *219th Meeting of the AAS*, Austin, TX — January 2012

AWARDS & HONORS

NHFP Hubble Fellowship — 2020
AAS Rodger Doxsey Travel Prize — 2018
UCLA Graduate Division Dissertation Year Fellowship — 2017
Richard B. Kaplan Endowed Graduate Award in Astrophysics — 2013, 2015
Outstanding Teaching Assistant Award, University of California, Los Angeles — 2013
Senior Bullitt Scholar in Astronomy, University of Louisville — 2010

PROFESSIONAL SERVICE

Keck/Liger instrument science team member, Extragalactic Science Lead — 2020-present
Keck All-Sky Precision Adaptive Optics (KAPA) Galaxy Evolution science team member — 2020-present
Reviewer for NASA Astrophysics Data Analysis Program (ADAP) grant proposals — 2019
Reviewer for UC MEXUS-CONACYT grant proposals — 2019
Reviewer for NASA FINESST grant proposals — 2019-2020
Referee of several articles for ApJ, ApJL, MNRAS — 2015-present
UC Davis Cosmology and Astronomy Seminar coordinator — 2018-present
UCLA Astronomy Graduate Admissions Committee — 2018
UCLA Astronomy Graduate Student Representative — 2016-2017

OUTREACH & PUBLIC EDUCATION

Astronomy Live! Summer Observing Workshop
Co-founder, lecturer, research mentor — 2014
Director — 2015-2017

The Astronomy Live! Summer Observing Workshop is an 8-week summer program for high school juniors and seniors that provides a hands-on introduction to observational astronomy. The goal of this program is to encourage students to pursue science education in college, specifically targeting underprivileged students. Students attend lectures on topics in physics and astronomy, basic computing, and data reduction techniques. Students complete individual research projects in which they remotely observe using a research-grade telescope (Nickel 1-meter) and CCD at Lick Observatory, reduce and analyze data on an astronomical object, and additionally gain hands-on experience with UCLA outreach telescopes.

UCLA Planetarium and Telescope Coordinator — 2013-2018

The UCLA Planetarium is run on a volunteer basis by graduate students and serves over 5,000 attendees per year. Coordinator responsibilities include scheduling, designing, and presenting planetarium shows, coordinating student volunteers, maintaining and servicing public outreach telescopes, maintaining the star projector and control system, and keeping the planetarium website up to date. I have given >100 planetarium shows at UCLA.

Astronomy Live! @ UCLA outreach program — 2013-2018

Participation in outreach events using telescopes and demonstrations for the general public and local schools, including leading booths and public observing at the annual Exploring Your Universe event, a day-long science fair at UCLA that hosts approximately 6,000 people.

PUBLICATIONS (41 PAPERS, 1540 TOTAL CITATIONS, H-INDEX=19)

FIRST-AUTHOR PUBLICATIONS (8 PAPERS, 485 CITATIONS)

1. "The MOSDEF Survey: Mass, Metallicity, and Star-formation Rate at z ~ 2.3"
   Sanders, R. L., Shapley, A. E., Kriek, M., Reddy, N. A., Freeman, W. R., Coil, A. L., Siana, B., Mobasher, B., Shivaei, I., Price, S. H., and de Groot, L., 2015, ApJ, 799, 138
2. "The MOSDEF Survey: Electron Density and Ionization Parameter at z ~ 2.3"
   Sanders, R. L., Shapley, A. E., Kriek, M., Reddy, N. A., Freeman, W. R., Coil, A. L., Siana, B., Mobasher, B., Shivaei, I., Price, S. H., and de Groot, L., 2016, ApJ, 816, 23
3. "The MOSDEF Survey: Detection of [O III]λ4363 and the direct-method oxygen abundance of a star-forming galaxy at z=3.08"
   Sanders, R. L., Shapley, A. E., Kriek, M., Reddy, N. A., Freeman, W. R., Coil, A. L., Siana, B., Mobasher, B., Shivaei, I., Price, S. H., & de Groot, L., 2016, ApJL, 835, L23
4. "Biases in metallicity measurements from global galaxy spectra: the effects of flux-weighting and diffuse ionized gas contamination"
   Sanders, R. L., Shapley, A. E., Zhang, K., and Yan, R., 2017, ApJ, 850, 136
5. "The MOSDEF Survey: A stellar mass-SFR-metallicity relation exists at z ~ 2.3"
   Sanders, R. L., Shapley, A. E., Kriek, M., Freeman, W. R., Reddy, N. A., Siana, B., Coil, A. L., Mobasher, B., Davé, R., Shivaei, I., Azadi, M., Price, S. H., Leung, G., Fetherolf, T., de Groot, L., Zick, T., Fornasini, F. M., and Barro, G., 2018, ApJ, 858, 99
6. "The MOSDEF Survey: Direct-method metallicities and ISM conditions at z~1.5-3.5"
   Sanders, R. L., Shapley, A. E., Reddy, N. A., Kriek, M., Siana, B., Coil, A. L., Mobasher, B., Shivaei, I., Freeman, W. R., Azadi, M., Price, S. H., Leung, G., Fetherolf, T., de Groot, L., Zick, T., Fornasini, F. M., and Barro, G., 2020, MNRAS, 491, 1427
7. "The MOSDEF Survey: [S III] as a new probe of evolving interstellar medium conditions"
   Sanders, R. L., Jones, T., Shapley, A. E., Reddy, N. A., Kriek, M., Siana, B., Coil, A. L., Mobasher, B., Davé, R., Shivaei, I., Freeman, W. R., Azadi, M., Price, S. H., Leung, G., Fetherolf, T., de Groot, L., Zick, T., Fornasini, F. M., and Barro, G., 2020, ApJL, 888, L11
8. "The MOSDEF Survey: The Evolution of the Mass-Metallicity Relation from z=0 to z~3.3"
   Sanders, R. L., Shapley, A. E., Jones, T., Reddy, N. A., Kriek, M., Siana, B., Coil, A. L., Mobasher, B., Shivaei, I., Davé, R., Azadi, M., Price, S. H., Leung, G., Freeman, W. R., Fetherolf, T., de Groot, L., Zick, T., & Barro, G., 2020, submitted to ApJ (arXiv:2009.07292)

PUBLICATIONS AS A CO-AUTHOR (33 PAPERS, 1055 CITATIONS)

***** = significant contribution/co-advised student paper (12)

1. "The MOSDEF Survey: Excitation Properties of z ~ 2.3 Star-forming Galaxies"
   Shapley, A. E., Reddy, N. A., Kriek, M., Freeman, W. R., **Sanders, R. L.**, Siana, B., Coil, A. L., Mobasher, B., Shivaei, I., Price, S. H., and de Groot, L., 2015, ApJ, 801, 88
2. "The MOSDEF Survey: Measurements of Balmer Decrements and the Dust Attenuation Curve at Redshifts z ~ 1.4-2.6"
   Reddy, N.A., Kriek, M., Shapley, A. E., Freeman, W. R., Siana, B., Coil, A. L., Mobasher, B., Price, S. H., **Sanders, R. L.**, and Shivaei, I., 2015, ApJ, 806, 259
3. "The MOSFIRE Deep Evolution Field (MOSDEF) Survey: Rest-frame Optical Spectroscopy for ~1500 H-selected Galaxies at 1.37 < z < 3.8"
   Kriek, M., Shapley, A. E., Reddy, N. A., Siana, B., Coil, A. L., Mobasher, B., Freeman, W. R., de Groot, L., Price, S. H., **Sanders, R. L.**, Shivaei, I., Brammer, G. B., Momcheva, I. G., Skelton, R. E., van Dokkum, P. G., Whitaker, K. E., Aird, J., Azadi, M., Kassis, M., Bullock, J. S., Conroy, C., Davé, R., Kereš, D., & Krumholz, M., 2015, ApJS, 218, 15

4. "The MOSDEF Survey: Dissecting the Star Formation Rate versus Stellar Mass Relation Using Hα and Hβ Emission Lines at z ~ 2"
   Shivaei, I., Reddy, N. A., Shapley, A. E., Kriek, M., Siana, B., Mobasher, B., Coil, A. L., Freeman, W. R., **Sanders, R. L.**, Price, S. H., de Groot, L., & Azadi, M., 2015, ApJ, 815, 98

5. "The MOSDEF Survey: Dynamical and Baryonic Masses and Kinematic Structures of Star-Forming Galaxies at $1.4 \leq z \leq 2.6$"
   Price, S. H., Kriek, M., Shapley, A. E., Reddy, N. A., Freeman, W. R., Coil, A. L., de Groot, L., Shivaei, I., Siana, B., Azadi, M., Barro, G., Mobasher, B., **Sanders, R. L.**, & Zick, T., 2016, ApJ, 819, 80

6. "The MOSDEF Survey: The strong agreement between Hα and UV-to-FIR star formation rates for z∼2 star-forming galaxies"
   Shivaei, I., Kriek, M., Reddy, N., Shapley, A., Barro, G., Conroy, C., Coil, A., Freeman, W., Mobasher, B., Siana, B., **Sanders, R. L.**, Price, S., Azadi, M., Pasha, I., & Inami, H., 2016, ApJL, 820, L23

7. "The MOSDEF Survey: AGN multi-wavelength identification, selection biases and host galaxy properties"
   Azadi, M., Coil, A. L., Aird, J., Reddy, N., Shapley, A., Freeman, W. R., Kriek, M., Leung, G. C., Mobasher, B., Price, S. H., **Sanders, R. L.**, Shivaei, I., & Siana, B., 2017, ApJ, 835, 27

8. "The MOSDEF Survey: Metallicity dependence of the PAH emission at High Redshift: Implications for 24 micron-inferred IR luminosities and star formation rates at z ~ 2"
   Shivaei, I., Reddy, N., Shapley, A., Siana, B., Kriek, M., Mobasher, B., Coil, A., Freeman, W. R., **Sanders, R. L.**, Price, S., & Azadi, M., 2017, ApJ, 837, 157

9.***** "The MOSDEF Survey: First Measurement of Nebular Oxygen Abundance at z > 4"
   Shapley, A. E., **Sanders, R. L.**, Reddy, N. A., Kriek, M., Freeman, W. R., Mobasher, B., Siana, B., Coil, A., Leung, G. C., de Groot, L., Shivaei, I., Price, S. H., Azadi, M., & Aird, J., 2017, ApJL, 846, L30

10. "The MOSDEF Survey: The prevalence and properties of galaxy-wide AGN-driven outflows at z ~ 2"
    Leung, G. C., Coil, A., Azadi, M., Aird, J., Shapley, A. E., Kriek, M., Mobasher, B., Reddy, N., Siana, B., Freeman, W. R., Price, S. H., **Sanders, R. L.**, & Shivaei, I., 2017, ApJ, 849, 48

11. "The MOSDEF Survey: Direct Observational Constraints on the Ionizing Photon Production Efficiency, ξ_{ion}, at z ~ 2"
    Shivaei, I., Reddy, N. A., Shapley, A. E., Kriek, M., Mobasher, B., Freeman, W. R., **Sanders, R. L.**, Coil, A., Price, S. H., Fetherolf, T., Azadi, M., Leung, G., & Zick, T., 2018, ApJ, 855, 42

12. "The MOSDEF Survey: The Nature of Mid-Infrared Excess Galaxies and a Comparison of IR and UV Star Formation Tracers at z ~ 2"
    Azadi, M., Coil, A., Aird, J., Shivaei, I., Reddy, N., Shapley, A. E., Kriek, M., Freeman, W. R., Leung, G. C., Mobasher, B., Price, S. H., **Sanders, R. L.**, Siana, B., & Zick, T., 2018, ApJ, 866, 63

13. "The MOSDEF Survey: Stellar Continuum Spectra and Star Formation Histories of Active, Transitional, and Quiescent Galaxies at $1.4 < z < 2.6$"
    Zick, T. O., Kriek, M., Shapley, A. E. , Reddy, N., Freeman, W. R., Siana, B., Coil, A., Azadi, M., Barro, G., Fetherolf, T., Fornasini, F. M., de Groot, L., Leung, G. C., Mobasher, B., Price, S. H., **Sanders, R. L.**, & Shivaei, I., 2018, ApJL, 867, L16

14.***** "The MOSDEF Survey: Significant Evolution in the Rest-Frame Optical Emission Line Equivalent Widths of Star-Forming Galaxies at z=1.4-3.8"
    Reddy, N., Shapley, A. E., **Sanders, R. L.**, Kriek, M., Coil, A., Shivaei, I., Freeman, W. R., Mobasher, B., Siana, B., Azadi, M., Fetherolf, T., Fornasini, F. M., Leung, G. C., Price, S. H., Zick, T. O., & Barro., G., 2018, ApJ, 869, 92

15. "The MOSDEF Survey: Broad emission lines at z = 1.4-3.8"
    Freeman, W. R., Siana, B., Kriek, M., Shapley, A. E., Reddy, N., Coil, A., Mobasher, B., Muratov, A. L., Azadi, M., Leung, G. C., **Sanders, R. L.**, Shivaei, I., Price, S. H., de Groot, L., & Kereš, D., 2019, ApJ, 873, 102

16.***** "The MOSDEF Survey: No Significant Enhancement in Star Formation or Deficit in Metallicity in Merging Galaxy Pairs at $1.5 \leq z \leq 3.5$"
Wilson, T. J., Shapley, A. E., **Sanders, R. L.**, Reddy, N., Freeman, W. R., Kriek, M., Shivaei, I., Coil., A., Siana, B., Mobasher, B., Price, S. H., Azadi, M., Barro, G., de Groot, L., Fetherolf, T., Fornasini, F. M., Leung, G. C., & Zick, T. O., 2019, ApJ, 874, 18

17.***** "Are LGRBs biased tracers of star formation? Clues from the host galaxies of the *Swift*/BAT6 complete sample of bright LGRBs III: Stellar masses, star-formation rates, and metallicities at z>1"
Palmerio, J. T., Vergani, S. D., Salvaterra, R., **Sanders, R. L.**, Japelj, J., Vidal-García, A., D'Avanzo, P., Corre, D., Perley, D. A., Shapley, A. E., Boissier, S., Greiner, J., Le Floc'h, E., & Wiseman, P., 2019, A&A, 623, A26

18. "PS18kh: A new tidal disruption event with a non-axisymmetric accretion disk"
T. W.-S. Holoien, M. E. Huber, B. J. Shappee, M. Eracleous, K. Auchettl, J. S. Brown, M. A. Tucker, K. C. Chambers, C. S. Kochanek, K. Z. Stanek, A. Rest, D. Bersier, R. S. Post, G. Aldering, K. A. Ponder, J. D. Simon, E. Kankare, D. Dong, G. Hallinan, N. A. Reddy, **R. L. Sanders**, M. W. Topping, *Pan-STARRS*, J. Bulger, T. B. Lowe, E. A. Magnier, A. S. B. Schultz, C. Z. Waters, M. Willman, D. Wright,D. R. Young, *ASAS-SN*, Subo Dong, J. L. Prieto, Todd A. Thompson, *ATLAS* ,L. Denneau, H. Flewelling, A. N. Heinze, S. J. Smartt, K. W. Smith, B. Stalder, J. L. Tonry, and H. Weiland, 2019, ApJ, 880, 120

19.***** "The MOSDEF Survey: Sulfur emission-line ratios provide new insights into evolving ISM conditions at high redshift"
Shapley, A. E., **Sanders, R. L.**, Shao, P., Reddy, N., Kriek, M., Coil., A., Mobasher, B., Siana, B., Shivaei, I., Freeman, W. R., Azadi, M., Price, S. H., Leung, G. C., Fetherolf, T., de Groot, L., Zick, T. O., Fornasini, F. M., & Barro, G., 2019, ApJL, 881, L35

20.***** "The MOSDEF Survey: The Metallicity Dependence of X-ray Binary Populations at z~2"
Fornasini, F. M., Kriek, M., **Sanders, R. L.**, Shivaei, I., Civano, F., Reddy, N. A., Shapley, A. E., Coil, A. L, Mobasher, B., Siana, B., Aird, J., Azadi, M., Freeman, W. R., Leung, G. C. K., Price, S. H., Fetherolf, T., Zick, T., & Barro, G. 2019, ApJ, 885, 65

21. "The MOSDEF Survey: A census of AGN-driven ionized outflows at z=1.4-3.8"
Leung, G. C., Coil., A., Aird, J., Azadi, M., Kriek, M., Mobasher, B., Reddy, N., Shapley, A. E., Siana, B., Fetherolf, T., Fornasini, F. M., Freeman, W. R., Price, S. H., **Sanders, R. L.**, Shivaei, I., & Zick, T. O., 2019, ApJ, 886, 11

22. "The MOSDEF Survey: Kinematic and Structural Evolution of Star-Forming Galaxies at $1.4 \leq z \leq 3.8$"
Price, S. H., Kriek, M., Barro, G., Shapley, A. E., Reddy, N. A., Freeman, W. R., Coil, A. L., Shivaei, I., Azadi, M., de Groot, L., Siana, B., Mobasher, B., **Sanders, R. L.**, Leung, G. C. K., Fetherolf, T., Zick, T. O., Übler, H., & Förster Schreiber, N. M., 2020, ApJ, 894, 91

23.***** "The MOSDEF-LRIS Survey:: The Interplay Between Massive Stars and Ionized Gas in High-Redshift Star-Forming Galaxies"
Topping, M. W., Shapley, A. E., Reddy, N. A., **Sanders, R. L.**, Coil, A. L., Kriek, M., Mobasher, B., & Siana, B., 2020, MNRAS, 495, 4430

24.***** "Kinematics of the Circumgalactic Medium of a z=0.77 Galaxy from MgII Tomography"
Mortensen, K., Keerthi Vasan, G. C., Jones, T., Faucher-Giguere, C.-A., **Sanders, R. L.,** Ellis, R. S., Leethochawalit, N., & Stark, D. P., 2020, submitted to ApJ (arXiv:2006.00006)

25.***** "The Mass-Metallicity Relation at z=8: Direct-Method Metallicity Constraints and Near-Future Prospects"
Jones, T., **Sanders, R. L.**, Roberts-Borsani, G., Ellis, R. S., Laporte, N., Treu, T., & Harikane, Y., 2020, accepted to ApJ (arXiv:2006.02447)

26. "The MOSDEF Survey: The Variation of the Dust Attenuation Curve with Metallicity"
Shivaei, I., Reddy, N., Rieke, G., Shapley, A. Kriek, M., Battisti, A., Mobasher, B., **Sanders, R. L.**, Fetherolf, T., Azadi, M., Coil, A. L., Freeman, W. R., de Groot, L., Leung, G., Price, S. H., Siana, B., & Zick, T., 2020, ApJ, 899, 117

27.***** "The MOSDEF Survey: Differences in SFR and Metallicity for Morphologically-Selected Mergers at z~2"
Horstman, K., Shapley, A. E., **Sanders, R. L.**, Mobasher, B., Reddy, N. A., Kreik, M., Coil, A. L., Siana, B., Shivaei, I., Freeman, W. R., Azadi, M., Price, S. H., Leung, G. C. K., Fetherolf, T., de Groot, L., Zick, T., Fornasini, F. M., & Barro, G., 2020, accepted to MNRAS (arXiv:2008.04327)

28. "The MOSDEF Survey: Untangling the Emission-Line Properties of z~2.3 Star-Forming Galaxies"
Runco, J. N., Shapley, A. E., **Sanders, R. L.**, Topping, M. W., Kriek, M., Reddy, N. A., Coil, A. L., Mobasher, B., Siana, B., Freeman, W. R., Shivaei, I., Azadi, M., Price, S. H., Leung, G. C. K., Fetherolf, T., de Groot, L., Zick, T., Fornasini, F. M., & Barro, G., 2020, submitted to MNRAS (arXiv:2008.04924)

29. "The First Robust Constraints on the Relationship Between Dust-to-Gas Ratio and Metallicity in Luminous Star-Forming Galaxies at High Redshift"
Shapley, A. E., Cullen, F., Dunlop, J. S., McLure, R. J., Kriek, M., Reddy, N. A., & **Sanders, R. L.**, 2020, accepted to ApJL (arXiv:2009.10091)

30. "The MOSDEF Survey: An Improved Voronoi Binning Technique on Spaitally Resolved Stellar Populations at z~2"
Fetherolf, T., Reddy, N. A., Shapley, A. E., Kriek, M., Siana, B., Coil, A. L., Mobasher, B., Freeman, W. R., **Sanders, R. L.**, Price, S. H., Shivaei, I., Azadi, M., de Groot, L., Leung, G. C. K., & Zick, T. O., 2020, MNRAS, 498, 5009

31.***** "The MOSDEF-LRIS Survey: The Connection Between Massive Stars and Ionized Gas in Individual Galaxies at z~2"
Topping, M. W., Shapley, A. E., Reddy, N. A., **Sanders, R., L.**, Coil, A. L., Kriek, M., Mobasher, B., & Siana, B., 2020, MNRAS, 499, 1652

32. "The MOSDEF Survey: The First Direct Measurements of the Nebular Dust Attenuation Curve at High Redshift"
Reddy, N. A., Shapley, A. E., Kriek, M., Steidel, C. C., Shivaei, I., **Sanders, R. L.**, Mobasher, B., Coil, A. L., Siana, B., Freeman, W. R., Azadi, M., Fetherolf, T., Leung, G. Price, S. H., & Zick, T., 2020, ApJ, 902, 123

33.***** "The MOSDEF Survey: Neon as a Probe of ISM Physical Conditions at High Redshift"
Jeong, Moon-Seong, Shapley, A. E., **Sanders, R. L.**, Runco, J. N., Topping, M. W., Reddy, N. A., Kriek, M., Coil, A. L., Mobasher, B., Siana, B., Shivaei, I., Freeman, W. R., Azadi, M., Price, S. H., Leung, G. C. K., Fetherolf, T., de Groot, L., Zick, T., Fornasini, F. M., & Barro, G., 2020, ApJL, 902, L16

WHITE PAPERS

1. "Liger: Next Generation Imager and Spectrograph for Keck Observatory Adaptive Optics"
Wright, S., Larkin, J. E., Jones, T., Kupke, R., Fitzgerald, M., Kassis, M., Cosens, M., Chisholm, E., Do, T., Fassnacht, C., Fisher, D., Ghez, A., Johnson, C., Keane, J., Kirby, E., Kress, E., Konopacky, Q., Lu, J. R., Maire, J., O'Meara, J., Reddy, N., **Sanders, R. L.**, Sandstrom, K., Shapley, A., Sohn, Ji-Man, Surya, A., Treu, T., Weber, R., Wiley, J., Wizinowich, P., Wong, M., & Zonca, A., 2019, BAAS, 51, 201 (Astro2020: Decadal Survey on Astronomy and Astrophysics, APC white papers)