

Kyle Dawson

CURRICULUM VITAE

CONTACT INFORMATION

Kyle Dawson
Professor
Department of Physics and Astronomy
University of Utah
kdawson@astro.utah.edu

EDUCATION

University of California - Berkeley, Berkeley, CA
PhD, Physics, 2004
Thesis – “**BIMA Survey of Arcminute Scale CMB Anisotropy**”
Cornell University, Ithaca, NY
BA, Physics, 1998

RESEARCH INTERESTS

Observational Cosmology (large-scale structure)
Large Spectroscopic Surveys

PROFESSIONAL EXPERIENCE

Professor, 2019 – present
Associate Professor, 2015 – 2019
Assistant Professor, 2009 – 2015
University of Utah, Salt Lake City, UT
SDSS-III – BOSS Survey Scientist (2010-2014)
SDSS-IV – eBOSS Principal Investigator (2017-2020), eBOSS Instrument Scientist (2014-2017)
DESI Project – Survey Design Lead (2013-2018); Survey Validation Scientist (2016-)
DESI Science – Chair of working group on Survey Design (2014-2018)
DESI Collaboration – Spokesperson (2020-)
DOE-HEP Cosmic Visions Dark Energy – Panel Member (2017-)
DOE-HEP Basic Research Needs: Dark Energy and Inflation (2019-2020)
Astronomy and Astrophysics Advisory Committee (AAAC) - Panel Member (2019-)
Lead: Transformative Excellence in Computational Astrophysics (new faculty line in Utah)

Postdoctoral Researcher, 2004 – 2008
Lawrence Berkeley National Laboratory, Berkeley, CA
Supernova (SN) Cosmology Project: HST Studies of $z > 1$ SNe and Galaxy Clusters
SN Acceleration Probe (proposed): CCD Detector Development

Graduate Student Researcher, 2000 – 2004
University of California - Berkeley, Berkeley, CA
30 GHz studies of CMB Anisotropy and Sunyaev-Zel’dovich in Clusters

External GRANTS and SUPPORT - \$5,024,600 total since 2009

Exploring Dark Energy at all Scales with eBOSS and DESI

DOE-HEP Comparative Review (current; renewal), 2019–2022, \$814,000

BOSS/eBOSS Research: Recurring Grant

DOE-HEP Comparative Review, \$890,000, 2013–2019

Observing Strategy, Commissioning, and Survey Validation for DESI

LBNL, DESI Project Office, 2017–2019, \$260,000

Conference Support for 2016 SnowPAC: The Galaxy/Halo Connection

NSF & DOE-HEP, 2016, \$14,900

The Extended Baryon Oscillation Spectroscopic Survey (eBOSS)

DOE-High Energy Physics – Operations, 2015–2020, \$2,190,000

eBOSS PI and Instrument Scientist Support

Astrophysical Research Consortium, SDSS-IV, 2013–2018, \$570,700

Survey Planning for BigBOSS Research and Development

DOE/LBNL, 2012, \$35,000

The Effect of Host Galaxy Environment on Type Ia Supernovae

SWIFT Guest Investigator Grant (PI: Peter Brown, postdoc), 2011, \$15,000

Ultra-Violet Effects of Environment on Type Ia SNe

SWIFT Guest Investigator Grant (PI: Peter Brown, postdoc), 2010, \$35,000

BOSS Survey Scientist Support

Astrophysical Research Consortium, SDSS-III, 2009–2014, \$200,000

PRIVATE and LOCAL GRANTS - \$1,175,400 total since 2009

Postdoc Fellowship in Astronomical Data Sciences

W.L. Eccles Foundation (on behalf of Astronomy group) 2019–, \$50,000/yr + match

Applications in Topology and Machine Learning to Lyman-alpha Forest Measurements

University of Utah Seed Grant, 2018–2019, \$20,000

Astronomy Outreach in the Department of Physics and Astronomy

W.L. Eccles Foundation (on behalf of Department), 2016–2017, \$25,000

General Outreach Activities in the Department of Physics and Astronomy

Local foundations (on behalf of Department), 2015–2019, \$230,000

Astronomy Research Support in the Department of Physics and Astronomy

Non-local foundation (on behalf of Astronomy group), 2015–2020, \$250,000

Cosmology with eBOSS

University of Utah Seed Grant, 2014–2015, \$33,000

University of Utah Membership to SDSS-IV

W.L. Eccles Foundation (with Adam Bolton, on behalf of Astro), 2013, \$350,000

Augmentation Grant for Development of Frisco Peak Observatory

NASA Space Grant Consortium of Utah, 2012, \$10,000 + \$10,000 U match

Upgrade to South Physics and Frisco Peak Observatories

W.L. Eccles Foundation (With Anil Seth and Wayne Springer), 2012, \$100,000

Dedicated 4x4 Truck for Access to Frisco Peak Observatory

Larry Miller Foundation and W.L. Eccles Foundation, 2010, ~\$25,000

Development of Remote Capabilities for the Willard L. Eccles Observatory

NASA Space Grant Consortium of Utah, 2010, \$25,000+\$25,000 U match

First Observations with the Southern Utah Astronomical Observatory

University of Utah Seed Grant, 2009, \$22,400

PUBLICATIONS (173 publications; ~26,500 citations; h-index = 69)

<https://ui.adsabs.harvard.edu/public-libraries/2JQZfLBBT8GUHTIWOkIHCA>

Topics include CMB, galaxy clusters, SNe, large-scale structure cosmology, and instrumentation. A full list of publications divided by field of research can be found through links at the bottom of this page:

<http://www.astro.utah.edu/~kdawson/research.html>

A subset reflecting efforts as faculty PI since 2009 is as follows (~2,500 citations)

Submitted or Published (Including astro2020 Decadal Survey White Papers)

24. *The Completed SDSS-IV extended Baryon Oscillation Spectroscopic Survey: Cosmological Implications from two Decades of Spectroscopic Surveys at the Apache Point observatory*
eBOSS Collaboration; **Dawson, K. PI**, 2020, submitted to Phys Rev D, arXiv:2007.08991
23. *The Completed SDSS-IV extended Baryon Oscillation Spectroscopic Survey: Baryon acoustic oscillations with Lyman- α forests*
du Mas des Bourboux, H. et al., 2020, Accepted by ApJ, arXiv:2007.08995
22. *Measurement of Redshift Evolving Mean Transmission of Lyman-alpha Photons at $2 < z < 4$*
Kamble, V.; Dawson, Kyle; et al., 2020, ApJ, 892, 1, 70
21. *SpecTel: A 10-12 meter class Spectroscopic Survey Telescope (astro2020)*
Ellis, Richard; **Dawson, Kyle;** et al., 2019, arxiv:1907.06797
20. *Maintaining Capabilities in CCD Production for the Astronomy Community (astro2020)*
Dawson, Kyle; Holland, Stephen; and Schlegel, David, 2019, arxiv:1907.06798
19. *The extended Baryon Oscillation Spectroscopic Survey: measuring the cross-correlation between the MgII flux transmission field and quasars and galaxies at $z=0.59$*
du Mas des Bourboux, H.; Dawson, Kyle; et al., 2019, ApJ, 878, 47
18. *Spectral Variability of High Redshift Quasars Through Multi-Epoch Analysis*
Dyer, Jamie; Dawson, Kyle; et al., 2019, ApJ, 880, 78
17. *Rapidly varying Mg II broad absorption line quasar: SDSS J133356.02+001229.1*
Vivek, M.; Srianand, R.; and **Dawson, K.S.**, 2018, MNRAS, 481, 5570
16. *The SDSS-IV extended Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations at redshift of 0.72 with the DR14 Luminous Red Galaxy Sample*
Bautista, Julian E.; Vargas-Magaña, Mariana; **Dawson, Kyle S.;** and 16 coauthors, 2018, ApJ,
15. *Measurement of BAO correlations at $z = 2.3$ with SDSS DR12 Ly α -Forests*
Bautista, Julian E.; and 26 coauthors, 2017, A&A, 603, 12
14. *Spectral Evolution in High Redshift Quasars from the Final Baryon Oscillation Spectroscopic Survey Sample*
Jensen, Trey W.; **Vivek, M.;** **Dawson, Kyle S.;** and 17 coauthors, 2016, ApJ, 833, 199
13. *Redshift Measurement and Spectral Classification for eBOSS Galaxies with the redmonster Software*
Hutchinson, Timothy; Bolton, Adam,; **Dawson, Kyle;** and 14 coauthors, 2016, AJ, 152, 205
12. *Improved Spectrophotometric Calibration of the SDSS-III BOSS Quasar Sample*
Margala, Daniel; Kirkby, David; **Dawson, Kyle;** Bailey, Stephen; Blanton, Michael; and Schneider, Donald P., 2016, ApJ, 831, 157
11. *The Composite Spectrum of BOSS Quasars Selected for Studies of the Lyman-alpha Forest*
Harris, D.; **Jensen, Trey;** and 19 coauthors, 2016, AJ, 151, 155
10. *The SDSS-IV Extended Baryon Oscillation Spectroscopic Survey: Overview and Early Data*

- Dawson, Kyle S.**; and 144 coauthors, 2016, AJ, 151, 44
9. *Mock Quasar-Lyman- α forest data-sets for the SDSS-III Baryon Oscillation Spectroscopic Survey*
Bautista, Julian E.; and 17 coauthors, 2015, JCAP, 05, 60
 8. *The Sloan Digital Sky Survey Reverberation Mapping Project: Technical Overview*
Shen, Yue; Brandt, W. N.; **Dawson, Kyle S.**; and 36 coauthors, 2015, AJ, 216, 4
 7. *Host Galaxy Spectra and Consequences for Supernova Typing from the SDSS SN Survey*
Olmstead, Matthew D.; **Brown, Peter J.**; and 30 coauthors, 2014, AJ, 147, 75
 6. *The Baryon Oscillation Spectroscopic Survey of SDSS-III*
Dawson, Kyle S.; and 164 coauthors, 2013, AJ, 145, 10
 5. *A Swift Look at SN 2011fe: The Earliest Ultraviolet Observations of a Type Ia Supernova*
Brown, Peter J.; **Dawson, Kyle S.**; and 9 coauthors, 2012, ApJ, 753, 22
 4. *Constraints on Type Ia Supernova Progenitor Companions from Early Ultraviolet Observations with Swift*
Brown, Peter J.; **Dawson, Kyle S.**; **Harris, David W.**; **Olmstead, Matthew**; Milne, Peter; Roming, Peter W. A., 2012, ApJ, 749, 18
 3. *Scaling Relations and Overabundance of Massive Clusters at $z > \sim 1$ from Weak-lensing Studies with the Hubble Space Telescope*
Jee, M. J.; **Dawson, Kyle S.**; and 23 coauthors, 2011, ApJ, 737, 59
 2. *An Intensive Hubble Space Telescope Survey for $z > 1$ Type Ia Supernovae by Targeting Galaxy Clusters*
Dawson, Kyle S.; and 60 coauthors, 2009, AJ, 138, 1271
 1. *Discovery of an Unusual Optical Transient with the Hubble Space Telescope*
Barbary, K.; **Dawson, Kyle S.**; and 28 coauthors, 2009, ApJ, 690, 1358

SYNERGISTIC ACTIVITIES

Member DOE-HEP Cosmic Visions Dark Energy panel (planning for future surveys)
 Member Astronomy and Astrophysics Advisory Council (FACA)
 Basic Research Needs for Future Dark Energy Research (4-member subset of DOE-HEP workshop)
 External Reviewer for NASA (Postdoc Fellowships, time allocation for Keck Telescope)
 External Reviewer for DOE-HEP – Cosmic Frontiers Comparative Review, Early Career, Dark Matter R&D
 External Reviewer for NSF – AAG
 External Reviewer for LSST – Operations, Dark Energy Science Collaboration
 External Reviewer for CMB-S4 – Science requirements
 External Reviewer for Swiss NSF
 Organizing Committee for SnowPAC conference - 2009, 2010, 2011, 2016, 2018
 Local Organizer for multiple DESI/eBOSS workshops
 Referee (Astrophysical Journal, Astronomy and Astrophysics, Reports on Progress in Physics, Astronomical Journal, Monthly Notices of the Royal Astronomical Society)

COMMUNITY INVOLVEMENT/ VOLUNTEER WORK

Public Lectures – College of Science, SL Astronomy Society, Whittier Elementary, Utah Film Center
 Physics associated with film, popular-level astronomy, and cosmology
Fundraising – In support of Dept. priorities since 2010
 Maintain relations with private donors for support of outreach, graduate education, and research
Consultant – Exhibit on “The Sky” at the Natural History Museum of Utah, 2010
Osher Series Lecturer – Adult education, astronomy and cosmology, 2009, 2010, 2016
Astronomy writer for NPR/KQED QUEST series, (www.kqed.org/quest), 2007 – 2008
 Wrote astronomy articles as part of a multi-media campaign in the SF Bay Area
Math instructor – San Quentin Prison, 2003
 Taught High School equivalency algebra and problem solving to inmates

SELECTED TALKS (Including all talks in 2017-2019 and planned talks for 2020)

- “SpecTel: Cosmology with Hundreds of Millions of Spectra in the 2030's”**, SLAC, 2020
- “What Constitutes a Stage-V Spectroscopy Survey in the 2030-2040's?”**, Snowmass seminar, 2020
- “Final Results and Cosmological Interpretation from eBOSS”**, RPM Seminar, LBNL, 2020
- “Final Results and Cosmological Interpretation from eBOSS”**, April APS meeting, featured talk in mini-symposium, Washington D.C., 2020
- “eBOSS: Cosmology with Baryon Acoustic Oscillations and Redshift Space Distortions”**, Kavli IPMU, Cosmic Acceleration Conference, 2020
- “SpecTel: A ~12 meter Telescope Optimized for Multiplexed Spectroscopy”**, UC Berkeley, BCCP workshop on Future Surveys, 2020
- “eBOSS Final Results: Special Session”**, AAS, Honolulu, 2020

- “DESI Program for Survey Validation”**, DESI workshop, Ohio State University, 2019
- “Path to Final SV Planning”**, DESI Commissioning and SV Review, NOAO - Tucson, 2019
- “Survey Validation Operations”**, DESI Commissioning and SV Review, NOAO - Tucson, 2019
- “Survey Validation and Program”**, DESI Collaboration meeting, LBNL, 2019
- “Status of eBOSS”**, SDSS-IV Collaboration meeting, Ensenada - Mexico, 2019
- “The Extended Baryon Oscillation Spectroscopic Survey”**, Colloquium, Penn State University, 2019
- “Cosmology with Spectroscopic Surveys”**, Colloquium, Idaho State University, 2019

- “Cosmology from Spectroscopic Surveys”**, Department Colloquium, University of Utah, 2018
- “Modeling Quasar Spectra for Enhanced Cosmological Studies”**, seminar, University of Utah, 2018
- “Stars, Galaxies, and the History of the Universe”**, Frontiers of Science, University of Utah, 2018
- “DESI PSF Modeling and Calibration”**, Gunnfest, Princeton, NJ, 2018
- “Large-scale Spectroscopy After DESI”**, SUGAR-RUSH conference, Shanghai, China, 2018
- “Lessons Learned from BOSS, eBOSS, and DEEP2”**, DESI workshop, Tucson, AZ, 2018
- “R&D for the Next Generation Spectroscopic Survey”**, SnowPAC, Snowbird Utah, 2018
- “Extended Baryon Oscillation Spectroscopic Survey”**, DOE Portfolio Review, Maryland, 2018
- “Survey Validation and Operations”**, DOE Operations Review, LBNL, Berkeley, 2018
- “Survey Validation”**, DOE Review – DESI Construction Closeout, LBNL, Berkeley, 2018
- “Survey Validation”**, Director’s Review - DESI Construction Closeout, LBNL, Berkeley, 2018
- “Survey Validation”**, DOE Review - Operations, LBNL, Berkeley, 2018
- “DESI Survey Validation”**, DESI Collaboration Meeting, Barcelona, Spain, 2018
- “Survey Validation”**, DESI Director’s Review - Operations, LBNL, Berkeley, 2018

- “Roadmap for Spectroscopy in the 2020’s”**, Cosmic Visions Workshop, LBNL, Berkeley, 2017
- “Cosmology from eBOSS”**, Cosmology Seminar, Ohio State University, Columbus, 2017
- “DESI Survey Validation”**, DESI Collaboration meeting, LBNL, Berkeley, 2017
- “DESI Survey Design”**, DESI Collaboration meeting, LBNL, Berkeley, 2017
- “Survey Validation Planning”**, DESI Project Review, NOAO, Tucson, 2017
- “DESI Survey Validation During Operations”**, DESI Director’s Review, LBNL, Berkeley, 2017
- “DESI Survey Software”**, DESI Director’s Review, LBNL, Berkeley, 2017

- “DESI Survey Design and Optimization”**, 15–20 reviews, LBNL, 2013-2016

- “Survey Validation for DESI”**, DESI/eBOSS Collaboration meeting, Ohio State, 2016
- “eBOSS: Status and Lessons Learned”**, DESI/eBOSS Collaboration meeting, Ohio State, 2016
- “High Density Galaxy Survey: BOA”**, Future Cosmic Surveys Workshop, U Chicago, 2016
- “The Extended Baryon Oscillation Spectroscopic Survey”**, SnowPAC, Snowbird, UT, 2016

“Spectroscopic Surveys: High Density Clustering After DESI; aka Billion Object Apparatus (BOA)”, Cosmic Visions Workshop for future facilities, Fermi Lab, 2015

“eBOSS: Survey and Challenges”, CPAD DOE Workshop, Grand Challenges for Detector Development over the next Ten Years, 2015, University of Texas-Arlington

“BOSS Operations”, DOE Operations Review, 2014, Bethesda

“eBOSS: Proposal for Six Years of Funding”, DOE Operations Review, 2014, Bethesda

“eBOSS: Survey Status and Development Efforts”, eBOSS Collaboration meeting, 2014, Cloudcroft, NM

“Next Ten Years of Cosmology with Spectroscopic Surveys”, Cosmology Workshop, 2014, Corfu, Greece

“Survey Planning and Operations”, Cosmology Workshop, 2014, Corfu, Greece

“Improving the Standard Candle”, HEAP seminar, University of Utah, 2014

“Cosmology with Supernovae, Galaxies, and Quasars”, Colloquium, University of Utah, 2014

“eBOSS and eBOSS Planning”, eBOSS project review, 2013, Berkeley

“The Extended Baryon Oscillations Spectroscopic Survey”, DOE-HEP, Snowmass, 2013, Minneapolis

“Clusters and Supernovae with HST”, Cosmology Seminar, Brookhaven National Laboratory, Brookhaven, NY, June, 2011.

“Clusters and Supernovae with HST”, SnowPAC, Snowbird, UT, Feb., 2011.

“Cosmology with Supernovae and Galaxy Clusters” Fermi National Laboratory, Astrophysics Colloquium, Batavia, IL, Dec, 2010.

“Supernova Cosmology with the Hubble Space Telescope”, Utah Valley University, Department Colloquium, Orem, UT, May, 2010.

“Supernova Cosmology”, University of Wyoming, Department Colloquium, Wyoming, February, 2010.

“Supernova Cosmology with the Hubble Space Telescope”, Brigham Young University, Department Colloquium, Provo, UT, February, 2010.

“HST Survey for High Redshift SNe”, 43rd Rencontres de Moriond, La Thuile Italy, March 15, 2008.

“Decelerating and Dustfree: Targeting SNe in Very High Redshift Galaxy Clusters”, LBNL Dept of Energy Review, Berkeley, CA – 2007.

“Radiation Tolerance of High-Resistivity LBNL CCDs”, IEEE Nuclear Science Symposium, San Diego, CA – 2006.

“Final Results from the BIMA Survey of Arcminute Scale CMB Anisotropy”, INPA colloquium, LBNL, Berkeley, CA – 2004.

“A BIMA Survey of Arcminute Scale CMB Anisotropy”, Kavli Institute for Cosmological Physics, University of Chicago, Chicago, IL – 2003.

COURSES TAUGHT

Phys 2210, “Physics for Engineers: Mechanics”, Fall 2017, 2X effort, 300 students,
Semi-flipped classroom, group problem solving to improve student interaction

Phys 2220, “Physics for Engineers: Electricity and Magnetism”, Spring 2018, 2X effort, 300 students,
Semi-flipped classroom, group problem solving to improve student interaction

Phys 3740, “Introduction to Quantum Mechanics and Special Relativity”, Spring 2011, 2013
Group problem solving to improve student interaction

Astr/Phys 4080, “Introduction to Cosmology”, Spring 2009

Astr/Phys 4080, “Introduction to Cosmology”, Spring 2010, 2012, 2014

Introduced new textbook: “Introduction to Cosmology” by Barbara Ryden

Astr/Phys 5015, “Observational Methods and Data Analysis”, Fall 2010, 2011, 2013

New course developed around Frisco Peak Observatory

STUDENTS/POSTDOCS SUPERVISED at UNIVERSITY OF UTAH

Postdoctoral Researchers

Angela Berti, 2020 – present
Sarah Eftekharzadeh, 2018 – present
Hélion Du Mas des Bourboux, 2017 – 2019 (Data Scientist, private sector)
Julian Bautista, 2014 – 2017 (Postdoc: Portsmouth)
Vivek Mariappan, 2014 – 2017 (Postdoc: Penn State, Ramanujan Fellowship: India)
Peter Brown, 2009 – 2012, (Postdoc, research scientist: Texas A&M)

Graduate Students

Allyson Brodzeller, 2020 – present
Alec Lovlein (Master's), 2018 – 2019 (Data Scientist, private sector)
Aishwarya Ashok, 2017
Timothy Hutchinson (Master's), 2015–2017 (Data Scientist, private sector)
Donna Taylor, 2015 (Transferred to CS)
Vikrant Kamble, 2014–2019 (Data Scientist, private sector)
Suchit Maindola (EECS), 2011
Matthew Olmstead, 2009–2014, (Assistant Professor: King's College)
David Harris, 2009–2015, (Lecturer: US Coast Guard Academy, Florida Gulf Coast University)

Undergraduate Students

Philippe Bruce-Woods David, 2018
Jamie Dyer, 2016 – 2017 (PhD program, Colorado State University)
Trey Jensen, 2013 – 2016 (PhD program: NYU, NSF Graduate Fellowship recipient)
Sarah Moran (Barnard College), REU at University of Utah, 2013 (PhD program: JHU)
Chris Ahn, 2012 – 2013 (PhD: University of Utah)
Erika Loertscher (Mathematics), freshman ACCESS program, 2012
Dennis Della Corte, 2010 – 2011 (PhD: Forschungszentrum Julich; Assistant Professor at BYU)
Nic Ramsrud, 2010 – 2011 (engineer, private sector)

UNIVERSITY COMMITTEES

Executive Committee – 2019-present
Development – 2010-present
Astronomy Faculty Search – 2009, 2011, 2016, 2019
High Energy Theory Faculty Search – 2018, 2020
Physic and Astronomy Department Chair Faculty Search – 2020
Faculty search: Director of Scientific Computing and Imaging Institute – 2020
Future's - 2019-2020
IT Staff hire - 2019
Policy Board – 2017-2020
Student Awards – 2013, 2014, 2016
Lecturer and Outreach Staff hire - 2011
Curriculum Committee – 2010
Graduate Student Admissions Committee – 2009, 2010, 2014, 2016
HEAP/BOWTIE Seminar – 2009-2011, 2017, 2018
Astronomy Task Force – 2009-present

TELESCOPE EXPERIENCE

Hubble Space Telescope
Subaru Observatory
Caltech Submillimeter Observatory
Kitt Peak National Observatory 4-m
Keck Observatory
Apache Point Observatory 3.5-m
Apache Point Observatory 2.5-m
University of California Lick 3-m
Owens Valley Radio Observatory
Very Large Array
Berkeley-Illinois-Maryland Association Array

FORMER ADVISORS

William Holzapfel, PhD advisor, 2000 – 2004, UC-Berkeley
Natalie Roe, postdoctoral advisor, 2004 – 2008, Lawrence Berkeley National Laboratory