Dr. Benjamin Lee Davis — Curriculum Vitæ

Websites — Personal: https://bendavis007.github.io ● Work: https://shorturl.at/0GcR7 ● Old Work: https://shorturl.at/EGJR4
Mailing Address — NYU Abu Dhabi, Saadiyat Campus, Computational Research (A2), 166G, P.O. Box 129188, Abu Dhabi, United Arab Emirates
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Virtual Contact File

EDUCATION

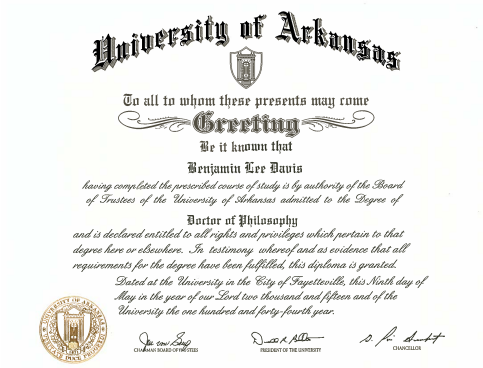
University of Arkansas, Fayetteville, Arkansas, USA — Aug 2008 – May 2015

Doctor of Philosophy (Ph.D.) in Space & Planetary Sciences
Thesis: Logarithmic Spiral Arm Pitch Angle of Spiral Galaxies: Measurement and Relationship to Galactic Structure and Nuclear Supermassive Black Hole Mass
Advisor: Dr. Julia Kennefick
Research areas: Astrophysics, extragalactic astronomy, structure & dynamics of disk galaxies.

Pittsburg State University, Pittsburg, Kansas, USA — Aug 2003 – May 2008

- Bachelor of Science (B.S.) in Mathematics
- Bachelor of Science (B.S.) in Physics
- Minor in Music

Magna Cum Laude


University of Arkansas

To all to whom these presents may come
Greeting
Be it known that
Benjamin Lee Davis
having completed the prescribed course of study is by authority of the Board of Trustees of the University of Arkansas admitted to the Degree of
Doctor of Philosophy
and is declared entitled to all rights and privileges which pertain to that degree here or elsewhere. In testimony whereof and as evidence that all requirements for the degree have been fulfilled, this diploma is granted.
Dated at the University in the City of Fayetteville, this Ninth day of May in the year of our Lord two thousand and fifteen and of the University the one hundred and forty-fourth year.


Pittsburg State University

by the authority of the Board of Regents and upon the recommendation of the Faculty has conferred upon
Benjamin L. Davis
the degree
Bachelor of Science
Mathematics and Physics
with all the Honors and Distinctions belonging to this Degree in consideration of the satisfactory completion of the Course of Study prescribed by the Faculty of the University.
Given at Pittsburg, Kansas, on the seventeenth day of May, in the year of our Lord two thousand and eight.

WORK EXPERIENCE

New York University Abu Dhabi — Sep 2020 – Aug 2026
Center for Astrophysics and Space Science (CASS)
CASS Fellow, Research Associate

Swinburne University of Technology — Aug 2016 – Jul 2020
Centre for Astrophysics and Supercomputing
Postdoctoral Research Fellow in Galaxy Structure

Arkansas Tech University, Department of Physical Sciences — Aug 2015 – May 2016
Visiting Assistant Professor of Physics

University of Arkansas, Department of Physics — Aug 2015 – Dec 2015
Visiting Assistant Professor of Physics

RESEARCH EXPERIENCE

Cosmic Explorer Consortium — May 2022 –
Member

Galaxy Formation Group, New York University Abu Dhabi — Sep 2020 – Aug 2026
Research Associate

LISA Consortium — May 2020 –
Member

ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav) — Feb 2018 –
Affiliate

Arkansas Galaxy Evolution Survey, University of Arkansas — May 2015 – Aug 2015
Postdoctoral Researcher

Arkansas Galaxy Evolution Survey, University of Arkansas — Jan 2009 – May 2015
Graduate Research Assistant

Arkansas Center for Space and Planetary Sciences, University of Arkansas — Aug 2008 – May 2015
Graduate Student

Cluster Lensing and Supernova Survey with Hubble, Jet Propulsion Laboratory
Visiting Student Research Program Intern — Jun 2011 – Aug 2011

PEER-REVIEWED PUBLICATIONS

36) Davis, B. L., More, S., Jin, Z., Pasquato, M., Macciò, A. V., & Yuan, F., "Causal Reversal in the $M_\bullet$–σ_0 Relation: Implications for High-Redshift Supermassive Black Hole Mass Estimates," submitted to *The Astrophysical Journal*, November 10, 2025.

35) Davis, B. L.*, Ali-Dib, M.*, Zheng, Y.*, Jin, Z.*, Zhang, K., & Macciò, A. V., "Causal evidence for the primordiality of colours in trans-Neptunian objects," *Monthly Notices of the Royal Astronomical Society Letters*, **543**, L34, October 1, 2025. *These authors contributed equally to this work and are listed alphabetically.

- Research News

34) Khan, F. M., Davis, B. L., Macciò, A. V., & Holley-Bockelmann, K., "Where Have All the Little Red Dots Gone? Supermassive Black Hole Binary Dynamics and Its Impact on Galaxy Properties," *The Astrophysical Journal Letters*, **986**, L1, June 2, 2025.

33) Jin, Z., Pasquato, M.*, Davis, B. L.*, Deleu, T., Luo, Y., Cho, C., Perreault-Levasseur, L., Lemos, P., Bengio, Y., Kang, X., Macciò, A. V., & Hezaveh, Y., "Causal Discovery in Astrophysics: Unraveling Supermassive Black Hole and Galaxy Coevolution," *The Astrophysical Journal*, **979**, 212, January 28, 2025. *These authors contributed equally to this work.

32) Waterval, S., Macciò, A. V., Buck, T., Obreja, A., Cho, C., Jin, Z., Davis, B. L., Dixon, K. L., & Kang, X., "HELLO project: High-z Evolution of Large and Luminous Objects," *Monthly Notices of the Royal Astronomical Society*, **533**, 1463, August 8, 2024.

31) Davis, B. L., Graham, A. W., Soria, R., Jin, Z., Karachentsev, I. D., Karachentseva, V. E., & D'Onghia, E., "Identification of Intermediate-mass Black Hole Candidates among a Sample of Sd Galaxies," *The Astrophysical Journal*, **971**, 123, August 12, 2024.

30) Davis, B. L. & Jin, Z., "Discovery of a Planar Black Hole Mass Scaling Relation for Spiral Galaxies," *The Astrophysical Journal Letters*, **956**, L22, October 11, 2023.

29) Amaro-Seoane, P., Andrews, J., Arca Sedda, M., ... Davis, B. L. *et al.*, "Astrophysics with the Laser Interferometer Space Antenna," *Living Reviews in Relativity* **26**, 2, March 14, 2023.

28) Fusco, M. S., Davis, B. L., Kennefick, J., Kennefick, D., & Seigar, M. S., "Probing the low-mass end of the black hole mass function via a study of faint local spiral galaxies," *Universe*, *8*(12), 649, December 6, 2022.

27) Shields, D., Boe, B., Pfountz, C., Davis, B. L., Hartley, M., Pour Imani, H., Slade, Z., Kennefick, D., & Kennefick, J., "Spirality: A Novel Way to Measure Spiral Arm Pitch Angle," *Galaxies*, *10*(5), 100, October 17, 2022.

- Astrophysics Source Code Library – http://ascl.net/1512.015
- https://github.com/DeannaShields/Spirality

26) Hon, D. S.-H., Graham, A. W., Davis, B. L., & Marconi, A., "Disc cloaking: Establishing a lower limit to the number density of local compact massive spheroids/bulges and the potential fate of some high-z red nuggets," *Monthly Notices of the Royal Astronomical Society*, **514**, 3410, August 2022.

25) Abdeen, S., Davis, B. L., Eufrasio, R., Kennefick, D., Kennefick, J., Miller, R., Shields, D. W., Monson, E. B., Bassett, C., & O'Mara, H., "Evidence in favour of density wave theory through age gradients observed in star formation history maps and spatially-resolved stellar clusters," *Monthly Notices of the Royal Astronomical Society*, **512**, 366, May, 2022.

24) Sahu, N., Graham, A. W., & Davis, B. L., "The (Black Hole Mass)–(Spheroid Stellar Density) Relations: $M_{\rm BH}$–μ (and $M_{\rm BH}$–Σ) and $M_{\rm BH}$–ρ," *The Astrophysical Journal*, **927**, 67, March 4, 2022.

23) Graham, A, W., Soria, R., Davis, B. L., Kolehmainen, M., Maccarone, T., Miller-Jones, J., Motch, C., & Swartz, D. A., "Central X-Ray Point Sources Found to Be Abundant in Low-mass, Late-type Galaxies Predicted to Contain an Intermediate-mass Black Hole," *The Astrophysical Journal*, **923**, 246, December 28, 2021.

22) Graham, A, W., Soria, R., Ciambur, B. C., Davis, B. L., & Swartz, D. A., "Potential Black Hole Seeding of the Spiral Galaxy NGC 4424 via an Infalling Star Cluster," *The Astrophysical Journal*, **923**, 146, December 16, 2021.

- Media Releases: Swinburne University of Technology, Scimex, NYUAD, University of Chinese Academy of Sciences (English), & University of Chinese Academy of Sciences (Chinese).
- News Article Coverage
- Media

21) Sahu, N., Graham, A. W., & Davis, B. L., "The Morphology-dependent Black Hole–Host Galaxy Correlations: A Consequence of Physical Formation Processes," *Acta Astrophysica Taurica*, 3(1), pp. 39-43, December 2, 2021.

20) Davis, B. L. & Graham, A. W., "Refining the mass estimate for the intermediate-mass black hole candidate in NGC 3319," *Publications of the Astronomical Society of Australia*, **38**, e030, July 8, 2021.

19) Sahu, N., Graham, A. W., & Davis, B. L., "Defining the (Black Hole)–Spheroid Connection with the Discovery of Morphology-dependent Substructure in the $M_{\rm BH}$–$n_{\rm sph}$ and $M_{\rm BH}$–$R_{\rm e,sph}$ Diagrams: New Tests for Advanced Theories and Realistic Simulations," *The Astrophysical Journal*, **903(2)**, 97, November 6, 2020.

18) Abdeen, S., Kennefick, D., Kennefick, J., Miller, R., Shields, D. W., Monson, E., & Davis, B. L., "Determining the Co-Rotation Radii of Spiral Galaxies Using Spiral Arm Pitch Angle Measurements at Multiple Wavelengths," *Monthly Notices of the Royal Astronomical Society*, **496**, 1610, June 8, 2020.

17) Sahu, N., Graham, A. W., & Davis, B. L., "Revealing Hidden Substructures in the $M_{\rm BH}$–σ Diagram, and Refining the Bend in the L–σ Relation," *The Astrophysical Journal*, **887**, 10, December 10, 2019.

16) Davis, B. L., Graham, A. W., & Combes, F., "A Consistent Set of Empirical Scaling Relations for Spiral Galaxies: The $(v_{\rm max},\, M_{\rm DM})$–$(\sigma_0,\, M_{\rm BH},\, \phi)$ Relations," *The Astrophysical Journal*, **877**, 64, May 24, 2019.

15) Sahu, N., Graham, A. W., & Davis, B. L., "Black Hole Mass Scaling Relations for Early-Type Galaxies. I. $M_{\rm BH}$–$M_{*,\rm sph}$ and $M_{\rm BH}$–$M_{*,\rm gal}$," *The Astrophysical Journal*, **876**, 155, May 15, 2019.

14) Miller, R., Kennefick, D., Kennefick, J., Shameer Abdeen, M, Monson, E., Eufrasio, R. T., Shields, D. W., & Davis, B. L., "Investigating the Origins of Spiral Structure in Disk Galaxies Through a Multi-wavelength Study," *The Astrophysical Journal*, **874**, 177, April 5, 2019.

- 📰 News Article Coverage

13) Graham, A. W., Soria, R., & Davis, B. L., "Expected intermediate mass black holes in the Virgo cluster. II. Late-type galaxies," *Monthly Notices of the Royal Astronomical Society*, **484**, 814, March 21, 2019.

12) Davis, B. L., Graham, A. W., & Cameron, E., "Black Hole Mass Scaling Relations for Spiral Galaxies. I. $M_{\rm BH}$–$M_{*,\rm sph}$," *The Astrophysical Journal*, **873**, 85, March 6, 2019.

11) Davis, B. L., Graham, A. W., & Cameron, E., "Black Hole Mass Scaling Relations for Spiral Galaxies. II. $M_{\rm BH}$–$M_{*,\rm tot}$ and $M_{\rm BH}$–$M_{*,\rm disk}$," *The Astrophysical Journal*, **869**, 113, December 17, 2018.

10) Davis, B. L., Graham, A. W., & Seigar, M. S., "Updating the (Supermassive Black Hole Mass) – (Spiral Arm Pitch Angle) Relation: A Strong Correlation for Galaxies with Pseudobulges," *Monthly Notices of the Royal Astronomical Society*, **471**, 2187, October 21, 2017.

- Jul 2017, Swinburne Media Release: "Spiral Arms Allow School Children to Weigh Black Holes"
  - UK Version (MNRAS)
- 📰 News Article Coverage

9) Koliopanos, F., Ciambur, B. C., Graham, A. W., Webb, N. A., Coriat, M., Mutlu-Pakdil, B., Davis, B. L., Godet, O., Barret, D., & Seigar, M. S., "Searching for Intermediate Mass Black Holes in Dwarf Galaxies with Low Luminosity AGN: A Multiple-method Approach," *Astronomy & Astrophysics*, **Volume 601**, A20, Dec 2016.

8) Mutlu-Pakdil, B., Seigar, M. S., & Davis, B. L., "The Local Black Hole Mass Function Derived from the $M_{BH} - P$ and the $M_{BH} - n$ Relations," *The Astrophysical Journal*, **830**, 117, Oct 2016.

7) Pour-Imani, H., Kennefick, D., Kennefick, J., Davis, B. L., Shields, D. W., & Shameer Abdeen, M., "Strong Evidence for the Density-wave Theory of Spiral Structure in Disk Galaxies," in *The Astrophysical Journal Letters*, **827**, L2, Aug 2016.

- 📰 News Article Coverage

6) Davis, B. L., "Logarithmic Spiral Arm Pitch Angle of Spiral Galaxies: Measurement and Relationship to Galactic Structure and Nuclear Supermassive Black Hole Mass," *University of Arkansas, PhDT*, May 2015.

5) Davis, B. L., Kennefick, D., Kennefick, J., Westfall, K. B., Shields, D. W., Flatman, R., Hartley, M. T., Berrier, J. C., Martinsson, T. P. K., & Swaters, R. A., "A Fundamental Plane of Spiral Structure in Disk Galaxies," *The Astrophysical Journal Letters*, **802**, L13, Mar 2015.

4) Seigar, M. S., Davis, B. L., Berrier, J. C., & Kennefick, D., "Constraining Dark Matter Halo Profiles and Galaxy Formation Models Using Spiral Arm Morphology. II. Dark and Stellar Mass Concentrations from 13 Nearby Face-On Galaxies," *The Astrophysical Journal*, **795**, 90, Nov 2014.

3) Davis, B. L., Berrier, J. C., Johns, L., Shields, D. W., Hartley, M. T., Kennefick, D., Kennefick, J., Seigar, M. S., & Lacy, C. H. S., "The Black Hole Mass Function Derived from Local Spiral Galaxies," *The Astrophysical Journal*, **789**, 124, Jul 2014.

2) Berrier, J. C., Davis, B. L., Kennefick, D. Kennefick, J., Seigar, M. S., Barrows, R. S., Hartley, M. T., Shields, D. W., Bentz, M. C., & Lacy, C. H. S., "Further Evidence for a Supermassive Black Hole – Pitch Angle Relation," *The Astrophysical Journal*, **769**, 132, Jun 2013.

1) Davis, B. L., Berrier, J. C., Shields, D. W., Kennefick, J., Kennefick, D., Seigar, M. S., Lacy, C. H. S., & Puerari I., "Measurement of Galactic Logarithmic Spiral Arm Pitch Angle Using Two-Dimensional Fast Fourier Transform Decomposition," *The Astrophysical Journal Supplement Series*, **199**, 33, Apr 2012.

- Astrophysics Source Code Library – http://ascl.net/1608.015
- https://github.com/bendavis007/2DFFT

If you are viewing this CV on paper, you may access a full list of my publications from my ORCID by visiting https://orcid.org/0000-0002-4306-5950 or scanning the QR code below.

Google Scholar Link

https://scholar.google.com/citations?user=B6dH1sgAAAAJ

NASA ADS Library Links

Refereed – https://ui.adsabs.harvard.edu/public-libraries/nG-zssYWRzSOGs1CUq8MUQ

All – https://ui.adsabs.harvard.edu/public-libraries/1IplwMbdTmunVHkWfUR6XA

CONFERENCES & PRESENTATIONS

49) *Cosmic Collisions Conference*, January 12–16, 2026, NYU Abu Dhabi. [Contributed Talk]

48) 247th Meeting of the American Astronomical Society January 4–8, 2026, Phoenix, AZ. [Oral Presentation]

47) New York Area Galaxy Seminar – Flatiron Institute: Center for Computational Astrophysics October 17, 2025, New York, NY. [Seminar Speaker]

46) Davis, B. L.*, Ali-Dib, M.*, Zheng, Y.*, Jin, Z.*, Zhang, K., & Macciò, A. V., "Causal Evidence for the Primordiality of Colors in Trans-Neptunian Objects," *3rd Machine Learning for Astrophysics Workshop at ICML*, July 20, 2025, Vancouver, Canada. [Poster] *These authors contributed equally to this work and are listed alphabetically.

45) *Dancing in the Dark: When Galaxies Shape Galaxies*, June 16–20, 2025, Sexten, Italy. [SOC & LOC]

44) Jin, Z., Pasquato, M.*, Davis, B. L.*, Macciò, A. V., & Hezaveh, Y., *Causal Discovery for Galaxy Evolution*, January 2025, 245th Meeting of the American Astronomical Society – Washington, D.C.. [Dissertation Talk] *These authors contributed equally to this work.

43) Jin, Z., Pasquato, M.*, Davis, B. L.*, Macciò, A. V., & Hezaveh, Y., *Beyond Causal Discovery for Astronomy: Learning Meaningful Representations with Independent Component Analysis*, December 15, 2024, NeurIPS 2024 – Vancouver, Canada. [Poster Presentation] *These authors contributed equally to this work.

42) Davis, B. L., "*Causmology*: Causal Discovery for Galaxy Evolution," *Deciphering the Cosmic Code for Galaxy Formation*, December 9–13, 2024, Puerto Varas, Chile. [Oral Contribution]

- Poster

41) *Variable Sources in Galaxies Workshop*, February 6–7, 2024, NYU Abu Dhabi. [Attendee]

40) Davis, B. L. & Jin, Z., "Discovery of a Planar Black Hole Mass Scaling Relation for Spiral Galaxies," *243RD MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY*, Jan 2024. [Research Contributed Presentation]

39) Pasquato, M., Jin, Z., Lemos, P., Davis, B. L., & Macciò, A. V., "*Causa prima*: cosmology meets causal discovery for the first time," *NeurIPS 2023 Workshop on Machine Learning and the Physical Sciences*, Dec 2023. [Poster Presentation]

- Poster
- Video

38) Jin, Z. & Davis, B. L., "Discovering Black Hole Mass Scaling Relations with Symbolic Regression," *NeurIPS 2023 Workshop on Machine Learning and the Physical Sciences*, Dec 2023. [Poster Presentation]

- Poster

37) Davis, B. L., "Using a Novel Black Hole Mass Scaling Relation to Identify Intermediate-mass Black Hole Candidates in Spiral Galaxies," *IMBH 2023: The Dawn of a Revolutionary Era*, Dec 2023. [Contributed Talk]

36) Davis, B. L. & Jin, Z., "A Planar Black Hole Mass Relation," *ASTROINFORMATICS-2023 CONFERENCE*, Oct 2023. [Contributed Talk]

- Video

35) Jin, Z., Davis, B. L., & Macciò, A. V., "Discovering black hole mass scaling relations with Symbolic Regression," *ASTROINFORMATICS-2023 CONFERENCE*, Oct 2023. [Contributed Talk]

- Video

34) Davis, B. L., "Galactic Vivisection: Toward an Improved Understanding of Galaxy Coevolution with their Massive Central Black Holes," Colloquium Speaker at the *University of New South Wales's School of Physics*, Mar 2023. [Invited Talk]

33) Davis, B. L., "Galactic Vivisection," *CAP^3/CSS "Brown Bag" Seminar*, Feb 2023. [Seminar Talk]

32) *Timescales in Astrophysics Conference*, January 16–20, 2023, NYU Abu Dhabi. [LOC]

31) Davis, B. L., "Ultracompact Dwarf Galaxies: sowing black holes and growing bulges via minor mergers," *Origin, growth and feedback of black holes in dwarf galaxies*, Sep 2022. [Contributed Talk]

30) Davis, B. L., Sahu, N., & Graham, A. W., "(Galaxy Morphology)–dependent (Supermassive Black Hole)–(Host Bulge/Galaxy) Correlations," *From Stars to Galaxies II: Connecting our understanding of star and galaxy formation*, Jun 2022. [Contributed Talk]

- E-proceedings
- Abstract
- Photo
- Slides
- Video

29) Davis, B. L., "Abundant Intermediate-mass Black Holes in Low-mass, Late-type Galaxies: Black Hole Mass Scaling Relations, X-ray Point Sources, and Seeding of Bulgeless Galaxies," *Intermediate-mass Black Holes: New Science from Stellar Evolution to Cosmology*, Apr 2022. [Research Contributed Presentation]

28) Davis, B. L., "Identifying Intermediate-mass Black Hole Candidates via the Combined Predictions of Multiple Black Hole Mass Scaling Relations," *AAS 239 Winter Meeting*, Jan 2022 (canceled due to the COVID-19 pandemic). [Research Contributed Presentation]

27) Sahu, N., Graham, A. W., & Davis, B. L., "The Morphology-dependent Black Hole–Host Galaxy Correlations: A Consequence of Physical Formation Processes," *Acta Astrophysica Taurica*, 3(1), pp. 39-43, December 2, 2021. [Research Contributed Presentation]

26) Davis, B. L., "The Latest Black Hole Mass Scaling Relations: Revealing Morphology Dependence, Substructure, and Implications for the Coevolution of Black Holes with their Host Galaxies," *CAP*^{3} *Seminar Series*, Oct 2020. [Seminar Talk]

25) Davis, B. L., "Title TBD," Seminar Speaker at the *International Centre for Radio Astronomy Research at the University of Western Australia*, Mar 2020 (canceled due to the COVID-19 pandemic). [Invited Talk]

24) Davis, B. L., Sahu, N., and Graham, A. W., "Substructure in black hole scaling diagrams and implications for the coevolution of black holes and galaxies," *Proceedings of the International Astronomical Union, Volume 15, Symposium S359: Galaxy Evolution and Feedback across Different Environments*, Mar 2020, pp. 37 - 39. [Poster Presentation]

- Poster
- Proceedings (Preprint)

23) Davis, B. L., "Black Hole Mass Scaling Relations," Seminar Speaker at the *Center for Astro, Particle, and Planetary Physics at New York University Abu Dhabi*, Feb 2020. [Invited Talk]

22) Davis, B. L., "Beethoven and the Voyager Golden Records," *Melbourne Chamber Orchestra's Beethoven Gala Dinner*, Oct 2019. [Invited Talk]

21) Davis, B. L. & Graham, A. W., "The Latest Black Hole Mass Scaling Relations," *Feedback and its Role in Galaxy Formation*, Jun 2019. [Contributed Talk]

- PowerPoint Slides
- Meeting Report

20) Davis, B. L. & Graham, A. W., "The Latest Black Hole Mass Scaling Relations," *Supermassive Black Holes: Environment and Evolution*, Jun 2019. [Contributed Talk]

- PowerPoint Slides

19) Davis, B. L., Graham, A. W., Sahu, N., & Cameron, E., "Black Hole Mass Scaling Relations," *American Astronomical Society Meeting Abstracts, Vol. 221, 206.02*, Jun 2019. [Contributed Talk]

- PowerPoint Slides

18) Davis, B. L., "Black Hole Mass Scaling Relations for Spiral Galaxies," *Astrophysics Colloquium: The University of Melbourne*, Sep 2018. [Seminar Talk]

- PowerPoint Slides

17) Davis, B. L., "Black Hole Mass Scaling Relations for Spiral Galaxies Determined from Pitch Angles and Multicomponent Structural Decompositions," *ASA 2018 Annual Scientific Meeting*, Jun 2018. [Poster Presentation]

- Video (starts at 1:25:55)
- Poster

16) Davis, B. L., "Black Hole Mass Scaling Relations for Spiral Galaxies Determined from Pitch Angles and Multicomponent Structural Decompositions," *Galactic Rings: Signposts of Secular Evolution in Disk Galaxies*, May 2018. [Contributed Talk]

- Video (starts at 3:49:30)
- PowerPoint Slides

15) Davis, B. L., "Black Hole Mass Scaling Relations for Spiral Galaxies," *California Institute of Technology, Astronomy Tea Talks*, Jan 2018. [Seminar Talk]

14) Davis, B. L., "Updating the (Supermassive Black Hole Mass) – (Spiral Arm Pitch Angle) Relation: A Strong Correlation for Galaxies with Pseudobulges," *National Astronomical Observatories, Chinese Academy of Sciences, Colloquium*, Oct 2017. [Seminar Talk]

13) Davis, B. L., "Updating the (Supermassive Black Hole Mass) – (Spiral Arm Pitch Angle) Relation: A Strong Correlation for Galaxies with Pseudobulges," *ASA 2017 Annual Scientific Meeting*, Jul 2017. [Contributed Talk]

12) Davis, B. L., "Spiral Arm Pitch Angle: Measurement and Relationship to Spiral Galaxy Structure and Supermassive Black Hole Mass," *ANITA Workshop 2017*, Feb 2017. [Contributed Talk]

11) Davis, B. L., "Spiral Arm Pitch Angle: Measurement and Relationship to Spiral Galaxy Structure and Supermassive Black Hole Mass," *Swinburne University of Technology, Centre for Astrophysics and Supercomputing, Colloquia Series*, Dec 2016. [Seminar Talk]

10) Davis, B. L., "A Fundamental Plane of Spiral Structure in Disk Galaxies," *A Lowell Observatory Workshop: The Formation and Evolution of Exponential Disks in Galaxies*, Oct 2014. [Poster Presentation]

- Poster

9) Davis, B. L., "The Black Hole Mass Function Derived from Local Spiral Galaxies," *Friday Scientific Lunch Talk at NOAO-Tucson*, Nov 2013. [Seminar Talk]

8) Davis, B. L., Berrier, J. C., Johns, L., Shields, D. W., Kennefick, D., Kennefick, J., Seigar, M. S., & Lacy, C. H. S., "The Black Hole Mass Function Derived from Local Spiral Galaxies," *Structure and Dynamics of Disk Galaxies, ASP Conference Series, Vol. 480, 2014, p. 204*, Aug 2013. [Contributed Talk]

7) Davis, B. L., "Logarithmic Spiral Arm Pitch Angle of Late-Type Galaxies: Measurement and Relationship to Galactic Nuclear Supermassive Black Hole Mass," *American Astronomical Society Meeting Abstracts, Vol. 221, 206.02*, Jan 2013. [Contributed Talk]

6) Davis, B. L., Berrier, J. C., Johns, L., Shields, D. W., Kennefick, D., Kennefick, J., Seigar, M. S., Lacy, & C. H. S, "The Local Black Hole Mass Function Derived from Spiral Galaxies," *American Astronomical Society Meeting Abstracts, Vol. 220, 430.08*, Jun 2012. [Poster Presentation]

5) Davis, B. L., Berrier, J. C., Johns, L., Shields, D. W., Kennefick, D., Kennefick, J., Seigar, M. S., Lacy, & C. H. S, "The Local Black Hole Mass Function Derived from Spiral Galaxies," *42nd Annual Mid-American Regional Astrophysics Conference*, Apr 2012. [Contributed Talk]

4) Davis, B. L., Berrier, J. C., Shields, D. W., Kennefick, J., Kennefick, D., Seigar, M. S., Lacy, C. H. S., & Puerari, I., "Measurement of Galactic Logarithmic Spiral Arm Pitch Angle Using Two-Dimensional Fast Fourier Transform Decomposition," *American Astronomical Society Meeting Abstracts, Vol. 219, 246.01*, Jan 2012. [Poster Presentation]

3) Davis, B. L., "Measurement of Galactic Logarithmic Spiral Arm Pitch Angle Using Two-Dimensional Fast Fourier Transform Decomposition," *Annual Mid-American Regional Astrophysics Conference*, Apr 2011. [Contributed Talk]

2) Davis, B. L., Berlanga Medina, J. E., Shields, D. W., Kennefick, J., Kennefick, D., Berrier, J., Seigar, M. S., Lacy, C. H. S., & AGES, "Investigating the Clustering and Color of Galaxies in the COMBO-17 Chandra Deep Field South Survey and Possible Effects on Spiral Arm Pitch Angle," *Bulletin of the American Astronomical Society, Vol. 42, American Astronomical Society Meeting Abstracts #215, 435.17*, Jan 2010. [Poster Presentation]

1) Davis, B. L., Chevrier, V. F., Altheide, T. S., & Swaffar, C., "Reflectance Spectra of Low-Temperature Chloride and Perchlorate Hydrates and Their Relevance to the Martian Surface," *Lunar and Planetary Institute Science Conference Abstracts, Vol. 40, 1387*, Mar 2009. [Contributed Talk]

MAGAZINE ARTICLE

Davis, B. (2017). "How You Can Weigh Black Holes," *Australasian Science, (Volume 38 | Number 5), pp.14-16, Sept/Oct 2017.*

- Preprint - https://bendavis007.github.io/PDFs/Australasian_Science.pdf

AWARDED OBSERVING TIME

Three Nights — Nov 2013
WIYN 3.5-m Telescope, pODI
For observation of AGN with spiral galaxy hosts at intermediate redshift.

- University of Arkansas News: "Physicists Awarded Telescope Time at Kitt Peak National Observatory"

ACADEMIC HONORS & AWARDS

Center for Astrophysics and Space Science Fellowship — 2020 – 2026
New York University Abu Dhabi

Postdoctoral Fellowship — 2016 – 2020
Swinburne University of Technology

2nd Place in the Physics Division of the "Abstract to Contract" Fifth Annual Graduate Student Research Symposium — Feb 2012
University of Arkansas Graduate School
For placing in a poster presentation competition amongst other physics graduate students at the University of Arkansas.

- University of Arkansas News: "Winners Announced for From Abstract to Contract: Graduate Student Research Competition"

1st Place in the Physical Science Division of the "Abstract to Contract" Third Annual Graduate Student Research Symposium — Feb 2010
University of Arkansas Graduate School
For winning a poster presentation competition amongst other physical science graduate students at the University of Arkansas.

Honorable Mention for the Chambliss Astronomy Achievement Student Award — Jan 2010
215th American Astronomical Society (AAS) Meeting
For recognition of exemplary research by undergraduate and graduate students who present at one of the poster sessions at the meetings of the AAS.

Doctoral Academy Fellowship — 2008 – 2012
University of Arkansas Graduate School
Supplemental fellowship from the graduate school to the top ≈40 incoming doctoral students as determined by GRE/GMAT scores.

GRANTS

International Astronomical Union (IAU) Symposia Travel Grant — Nov 2019
IAU Symposium 359: Galaxy Evolution and Feedback Across Different Environments (GALFEED)
€1000 travel grant to attend the GALFEED conference at Bento Gonçalves, RS, Brazil, March 2-6, 2020.

Research Infrastructure Program — 2014
Arkansas Space Grant Consortium
Project: The Host Galaxies of Active Galactic Nuclei at Moderate Redshifts

Graduate Fellowship Program — 2013
Arkansas Space Grant Consortium

Scholarship Program — 2011
Arkansas Space Grant Consortium
Project: An Investigation of the Evolution of Spiral Galaxies Using N-Body Simulations and the Possible Effects of Dark Matter Concentration and Galaxy Environment.

TEACHING EXPERIENCE

New York University Abu Dhabi Sep 2020 – Aug 2026
Guest Lecturer: Galaxy Formation.

Arkansas Tech University Aug 2015 – May 2016
Visiting Assistant Professor of Physics: General Physics II, Introduction to Physical Science, Physical Science Laboratory, Physics Laboratory I, and Physics Laboratory II.

University of Arkansas Aug 2015 – Dec 2015
Visiting Assistant Professor of Physics: University Physics I.

University of Arkansas Aug 2008 – Dec 2014
Graduate Student: Survey of the Universe, Survey of the Universe Laboratory, College Physics II Drill, and University Physics I Laboratory.

Pittsburg State University, Jan 2006 – May 2008
Teaching Assistant: Astronomy Laboratory.

PROFESSIONAL MEMBERSHIPS

The New York Academy of Sciences – Member

PROFESSIONAL SERVICE

New York University Abu Dhabi Sep 2020 – Aug 2026
Center for Astrophysics and Space Science (CASS)
CASS Fellow, Research Associate

- Served on the search committee for a postdoctoral position in galaxy formation.
- Served on the SOC/LOC for three NYUAD conferences.

Swinburne University of Technology Aug 2016 – Jul 2020
Centre for Astrophysics and Supercomputing

- Accredited Supervisor for Masters and Ph.D. Students.
  - Associate Supervisor for Ph.D. Student Nandini Sahu.
  - Associate Supervisor for Ph.D. Student Suei-Hei (Dexter) Hon.
- Served on the Ph.D. Student Review Panels for Ellert van der Velden, Jonah Gannon, Liyualem Tilahun, and Arianna Dolfi.

MENTORING

Three Ph.D. students: Nandini Sahu (Ph.D., 2022), Dexter Hon (Ph.D., 2022), and Zehao Jin (Ph.D., 2025).

COMMUNITY SERVICE

University Symphony Orchestra, University of Arkansas Aug 2009 – May 2016
Violin (Section I, Concertmaster, Section II Principal), Viola (Principal)

Southeast Kansas Symphony Orchestra, Pittsburg State University Aug 2003 – May 2008
Violin (Section I, Concertmaster, Section II), Viola (Principal)

The PSU Chamber Orchestra, Pittsburg State University Aug 2003 – May 2008
Violin (Section I, Concertmaster, Section II), Viola (Principal)

OTHER WORK EXPERIENCE

Private Violin Lessons, taught from my home in Goshen, AR 2013 – 2014
4 students, weekly lessons

Arkansas Philharmonic Orchestra, Bentonville, Arkansas, USA May 2009 – May 2016
Section Violin I

Litigation Resource Group, LLC, Fort Smith, Arkansas, USA — Jul 2012 – Feb 2013
Videographer/Accident Reconstruction Consultant

North Arkansas Symphony Orchestra, Fayetteville, Arkansas, USA — Nov 2006 – Apr 2008
Section Violin I & II

Sentinel Times, Galena, Kansas, USA — Jun 2000 – Jun 2008
Junior Editor/Mail & Delivery Services

Old Riverton Store, Riverton, Kansas, USA — Jun 1998 – Jun 2008
Clerk/Salesman/Food Service/Horticulturist

Freelance Musician — Jun 1996 –
Violinist/Violist

- National Broadway Tours: *South Pacific* & *West Side Story*
- *Ad hoc* string quartets for weddings and events

LANGUAGES

English: Native language

CITIZENSHIP

US Citizen; Born in Joplin, Missouri, USA

SKILLS, INTERESTS, & EXPERTISE

Logarithmic Spiral Arm Pitch Angle, Multicomponent Galaxy Decomposition, Telescopes, Black Holes, Data Reduction, Galaxy Evolution, Astronomy, Astrophysics, Active Galactic Nuclei, Galaxy Structure, Galaxy Dynamics, Quasars, Galaxy Clusters, Dark Matter, Galaxy Formation, Space & Planetary Sciences, Martian Surface Chemistry, Trans-Neptunian Objects, Problem Solving, Data Science, Data Engineering, Data Analysis, Observing, Classical Music, Music Performance, Oration, Teaching, Golf, Tennis, Baseball, Basketball, Violin, Viola, Guitar, Bass, Piano, Ukulele, Saxophone, Singing, SCUBA Diving, Carpentry, Woodworking, Games (Card, Board, & Video), etc.

Typing Proficiency: 67 WPM (285 CPM) with 100% accuracy

SOFTWARE AND COMPUTATIONAL METHODS

TEX, LATEX, XETEX, MATLAB, Mathematica, R, Adobe Creative Cloud, IRAF, DS9, Gimp, Supermongo, Microsoft Office Suite, PC/Mac/Unix/Linux OS, Google Analytics, Google Lighthouse, Google Search Console, Semrush, Fortran, C++, IDL, HTML, Python, MPI, Machine Learning, Symbolic Regression, Causal Discovery, SQL, HPC, etc.

REFERENCES

Dr. Andrea Valerio Macciò (CASS Principal Investigator)
Professor of Physics; Director, Center for Astrophysics and Space Science
New York University Abu Dhabi, Center for Astrophysics and Space Science (CASS)
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Professor
Swinburne University of Technology, Centre for Astrophysics and Supercomputing
Mail Number H29, PO Box 218
Hawthorn, Victoria 3122, Australia
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Dr. Julia Kennefick (Ph.D. Advisor)
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University of Arkansas, Department of Physics
825 West Dickson Street
Fayetteville, Arkansas 72701, USA
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Additional references are available upon request.

ONLINE

If you are viewing this CV on paper, you may access the most recent electronic version online with hyperlinks embedded in the document (blue text) at https://bendavis007.github.io/PDFs/CV.pdf or by scanning the QR code below.

VERSION

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