

CURRICULUM VITAE
Barbara Sue Ryden

Current address:

Ohio State University
Department of Astronomy
140 W. 18th Avenue
Columbus, OH 43210-1173
Phone: (614) 292-4562
Fax: (614) 292-2928
Email: ryden.1@osu.edu

Employment history:

October 2010 –
Professor, Ohio State University, Department of Astronomy
October 1998 – September 2010
Associate Professor, Ohio State University, Department of Astronomy
October 1992 – September 1998
Assistant Professor, Ohio State University, Department of Astronomy
September 1990 – August 1992
Postdoctoral research fellow, Canadian Institute for Theoretical Astrophysics
September 1987 – August 1990
Postdoctoral research fellow, Harvard-Smithsonian Center for Astrophysics

Education:

Ph. D. (1987) Princeton University
Astrophysics
Thesis adviser: James E. Gunn
B. A. (1983) Northwestern University
Physics and Integrated Science Program

Honors, etc.:

Fellow, American Association for the Advancement of Science (2016)
Chambliss Astronomical Writing Award (2006)
NSF Young Investigator (1993-98)
Participant, Summer Program for
Young Investigators in Cosmology (1990-91)
Smithsonian Postdoctoral Fellow (1987-90)
Jacobus Honorary Fellow (1986-87)
NSF Graduate Fellow (1983-86)
Phi Beta Kappa (1982)

Membership in Professional Societies:

American Association for the Advancement of Science
American Astronomical Society
Astronomical Society of the Pacific

Graduate Thesis Students Supervised:

S. M. Khairul Alam (M.S. 2002)
The Shapes of Galaxies in the Sloan Digital Sky Survey
Alberto Conti (Ph.D. 2000)
Evolution of the Properties of Galaxies
Aniruddha Thakar (Ph.D. 1997)
A Numerical Study of Counterrotating Disks in Spiral Galaxies

Undergraduate Thesis Students Supervised:

Derrick James (Honors thesis 2017)
Active Galactic Nuclei and the Green Valley
Andrew Gallagher (Honors thesis 2013)
Searching for Dark Galaxies Via Their Distorted Companions in the SDSS
Jesse Buxton (Honors thesis 2010)
Relative Orientation of Binary Spiral Galaxies
Cayman Unterborn (Honors thesis 2007)
Inclination-dependent Extinction Effects in Disk Galaxies in the SDSS

Recent Talks, Colloquia, Short Courses, & Other Presentations:

10/17: School for OWLS, Columbus, OH
Course: Exploring Einstein's universe
6/16: ICTP Cosmology School, Trieste, Italy
Lecture series: Introduction to cosmology
10/14: School for OWLS, Columbus, OH
Course: Cosmology – history of the universe
5/14: Lifelong Learning Institute, Central Ohio Technical College, Pataskala, OH
Course: Black holes
4/14: Ohio Emergency Management Agency Directors Conference, Columbus, OH
Invited talk: Threats from space – asteroid impacts and solar storms
11/13: Leiden Observatory, Leiden, Netherlands
Lunch talk: Spin orientations of pairs of spiral galaxies
11/13: Symposium NSA, University of Amsterdam, Amsterdam, Netherlands
Invited talk: Learning to love lambda – a history of dark energy
7/13: Lifelong Learning Institute, Central Ohio Technical College, Pataskala, OH
Course: Life in the universe

4/13: University of Cincinnati, Dept. of Physics, Cincinnati, OH
Colloquium: Torquing up spiral galaxies
7/12: Lifelong Learning Institute, Central Ohio Technical College, Pataskala, OH
Course: History of the universe
6/12: Gordon Research Conference, Physics Research & Education, Waterville, ME
Discussion Leader: Gravitational Radiation & Interesting Objects
7/11: “Using Astronomy to Teach Physics” workshop, Lincoln, NE
Invited talk: Interpreting Hubble’s law
12/10: IDPASC, Sesimbra, Portugal
Lecture series: Introduction to cosmology
3/10: Columbus Museum of Art, Columbus, OH
“Big Picture” talk: Telescopes – capturing light with glass

Courses Taught at Ohio State University:

Undergraduate (non-majors):

Astronomy 1101: From Planets to the Cosmos
Astronomy 1140: Planets & the Solar System (Sp 2018)
Astronomy 141/1141: Life in the Universe
Astronomy 143/1143: Cosmology: History of the Universe
Astronomy 161: Introduction to Solar System Astronomy
Astronomy 162: Introduction to Stellar, Galactic, & Extragalactic Astronomy
Astronomy H162: Honors Intro to Stellar, Galactic, & Extragalactic Astronomy

Undergraduate (majors):

Astronomy 291/2291: Basic Astrophysics & Planetary Astronomy
Astronomy 292: Stellar, Galactic, & Extragalactic Astronomy & Astrophysics
Astronomy 642: Extragalactic Astronomy
Astronomy 682: Introduction to Cosmology

Graduate:

Astronomy 810/7810: Order of Magnitude Astrophysics
Astronomy 822: Electromagnetic Radiation
Astronomy 825: Radiative Gas Dynamics
Astronomy 8831: Stellar Structure & Evolution
Astronomy 870: Stellar Systems
Astronomy 8870: Dynamics
Astronomy 8871: Interstellar Medium & Intergalactic Medium
Astronomy 873/8873: Cosmology & Structure Formation

BIBLIOGRAPHY

Books

1. *Introduction to Cosmology*. Barbara Ryden, 2003, San Francisco: Addison Wesley. [ISBN: 978-0805389128]
2. *Uchūron Nyūmon*. Barbara Ryden, 2003, translated by Nobuyoshi Makino, Tokyo: Pearson Education Japan. [ISBN: 978-4894714434]
3. *Foundations of Astrophysics*. Barbara Ryden & Bradley M. Peterson, 2010, San Francisco: Addison Wesley. [ISBN: 978-0321595584]
4. *Foundations of Astrophysics, International Edition*. Barbara Ryden & Bradley M. Peterson, 2011, Upper Saddle River, NJ: Pearson Education. [ISBN: 978-0321748058]
5. *Introduction to Cosmology, International Edition*. Barbara Ryden, 2014, Harlow, Essex, England: Pearson Education Limited. [ISBN: 978-1292039718]
6. *Interstellar and Intergalactic Medium*. Barbara Ryden & Richard Pogge, 2015, The Ohio State University. [ISBN: 978-1941602027]
7. *Dynamics*. Barbara Ryden, 2016, The Ohio State University. [ISBN: 978-1941602041]
8. *Introduction to Cosmology, Second Edition*. Barbara Ryden, 2017, Cambridge, England: Cambridge University Press. [ISBN: 978-1107154834]
9. *Stellar Structure and Evolution*. Marc Pinsonneault & Barbara Ryden, 2017, The Ohio State University, in preparation.

Refereed papers

1. “A Statistical Comparison of Voids in the Galaxy Distribution and n-body Simulations.” Barbara S. Ryden & Edwin L. Turner, 1984, ApJL, 287, L59-63
2. “Molecules in Galaxies. I. CO Observations in a Spiral Arm of M31.” Barbara S. Ryden & Antony A. Stark, 1986, ApJ, 305, 823-29
3. “Galaxy Formation by Gravitational Collapse.” Barbara S. Ryden & James E. Gunn, 1987, ApJ, 318, 15-31
4. “Galaxy Formation: The Role of Tidal Torques and Dissipational Infall.” Barbara S. Ryden, 1988, ApJ, 329, 589-611
5. “Collapse of Density Peaks in a Gaussian Random Field.” Barbara S. Ryden, 1988, ApJ, 333, 78-89
6. “The Area of Isodensity Contours as a Measure of Large Scale Structure.” Barbara S. Ryden, 1988, ApJL, 333, L41-44
7. “The Area of Isodensity Contours in Cosmological Models and Galaxy Surveys.” Barbara S. Ryden, Adrian L. Melott, David A. Craig, J. Richard Gott

- III, David H. Weinberg, Robert J. Scherrer, Suketu P. Bhavsar, & John M. Miller, 1989, *ApJ*, 340, 647-60
8. "Dynamical Evolution of Domain Walls in an Expanding Universe." William H. Press, Barbara S. Ryden, & David N. Spergel, 1989, *ApJ*, 347, 590-604
 9. "Single Mechanism for Generating Large Scale Structure and Providing Dark Missing Matter." William H. Press, Barbara S. Ryden, & David N. Spergel, 1990, *Phys. Rev. Lett.*, 64, 1084-87
 10. "Oblate Spheroidal Mass Distributions of Varying Ellipticity." Barbara S. Ryden, 1990, *MNRAS*, 244, 341-48
 11. "The Evolution of Networks of Domain Walls and Cosmic Strings." Barbara S. Ryden, William H. Press, & David N. Spergel, 1990, *ApJ*, 357, 293-300
 12. "Global Texture as the Origin of Large Scale Structure: Numerical Simulations of Evolution." David N. Spergel, Neil Turok, William H. Press, & Barbara S. Ryden, 1991, *Phys. Rev.*, D43, 1038-46
 13. "Compression of Dark Halos by Baryon Infall: Self-similar Solutions." Barbara S. Ryden, 1991, *ApJ*, 370, 15-24
 14. "Phase Shifts in Gravitationally Evolving Density Fields." Barbara S. Ryden & Mirt Gramann, 1991, *ApJL*, 383, L33-36
 15. "Projections of Ellipsoidal Galaxies." Barbara S. Ryden, 1991, *MNRAS*, 253, 743-52
 16. "Projections of Box-shaped Galaxies." Barbara S. Ryden, 1992, *ApJ*, 386, 42-51
 17. "The Intrinsic Shapes of Elliptical Galaxies." Barbara S. Ryden, 1992, *ApJ*, 396, 445-52
 18. "The Shapes of Brightest Cluster Galaxies." Barbara S. Ryden, Tod R. Lauer, & Marc Postman, 1993, *ApJ*, 410, 515-19
 19. "Self-similar Collapse of Axisymmetric Systems." Barbara S. Ryden, 1993, *ApJ*, 418, 4-10
 20. "Self-similar Expansion of Axisymmetric Voids." Barbara S. Ryden, 1994, *ApJ*, 423, 534-38
 21. "The Flattening Distribution of Dwarf Elliptical Galaxies in the Virgo Cluster." Barbara S. Ryden & Donald M. Terndrup, 1994, *ApJ*, 425, 43-50
 22. "A Comparison of the Intrinsic Shapes of Globular Clusters in Four Different Galaxies." Cheongho Han & Barbara S. Ryden, 1994, *ApJ*, 433, 80-87
 23. "Measuring q_0 from the Distortion of Voids in Redshift Space." Barbara S. Ryden, 1995, *ApJ*, 452, 25-32
 24. "Formation of Massive Counterrotating Disks in Spiral Galaxies." Anirudha R. Thakar & Barbara S. Ryden, 1996, *ApJ*, 461, 55-71
 25. "The Intrinsic Shapes of Stellar Systems." Barbara S. Ryden, 1996, *ApJ*, 461, 146-154

26. "Voids in Real Space and in Redshift Space." Barbara S. Ryden & Adrian L. Melott, 1996, *ApJ*, 470, 160-171
27. "The Shapes of Dense Cores and Bok Globules." Barbara S. Ryden, 1996, *ApJ*, 471, 822-31
28. "NGC 4138 – A Case Study in Counterrotating Disk Formation." Aniruddha R. Thakar, Barbara S. Ryden, Katherine P. Jore, & Adrick H. Broeils, 1997, *ApJ*, 479, 702-22
29. "Quasar Clustering and Spacetime Geometry." Piotr A. Popowski, David H. Weinberg, Barbara S. Ryden, & Patrick S. Osmer, 1998, *ApJ*, 498, 11-25
30. "A Comparison of the Intrinsic Shapes of Two Different Types of Dwarf Galaxies: Blue Compact Dwarfs and Dwarf Ellipticals." Eon-Chang Sung, Cheongho Han, Barbara S. Ryden, Mun-Suk Chun, & Ho-Il Kim, 1998, *ApJ*, 499, 140-148
31. "The Intrinsic Shapes of Low-Surface-Brightness Dwarf Irregular Galaxies and Comparison to Other Types of Dwarf Galaxies." Eon-Chang Sung, Cheongho Han, Barbara S. Ryden, Richard J. Patterson, Mun-Suk Chun, Ho-Il Kim, Woo-Baik Lee, & Dong-Jin Kim, 1998, *ApJ*, 505, 199-206
32. "SPH Simulations of Counterrotating Disk Formation in Spiral Galaxies." Aniruddha R. Thakar & Barbara S. Ryden, 1998, *ApJ*, 506, 93-115
33. "Detailed Surface Photometry of Dwarf Elliptical and Dwarf S0 Galaxies in the Virgo Cluster." Barbara S. Ryden, Donald M. Terndrup, Richard W. Pogge, & Tod R. Lauer, 1999, *ApJ*, 517, 650-660
34. "The Size and Shape of Voids in Three-dimensional Galaxy Surveys." Jason Schmidt, Barbara S. Ryden, & Adrian L. Melott, 2001, *ApJ*, 546, 609-619
35. "Structural Evolution in Elliptical Galaxies: The Age – Shape Relation." Barbara S. Ryden, Duncan A. Forbes, & A. I. Terlevich, 2001, *MNRAS*, 326, 1141-1148
36. "The Shapes of Galaxies in the Sloan Digital Sky Survey." S. M. Khairul Alam & Barbara S. Ryden, 2002, *ApJ*, 570, 610-617
37. "The Ellipticity of the Disks of Spiral Galaxies." Barbara S. Ryden, 2004, *ApJ*, 601, 214-220
38. "The Dependence of Galaxy Shape on Luminosity and Surface Brightness Profile." R. Anthony Vincent & Barbara S. Ryden, 2005, *ApJ*, 623, 137-147
39. "Dependence of Galaxy Shape on Environment in the Sloan Digital Sky Survey." Frederick Kuehn & Barbara S. Ryden, 2005, *ApJ*, 634, 1032-1042
40. "The Intrinsic Shape of Spiral Galaxies in the 2MASS Large Galaxy Atlas." Barbara S. Ryden, 2006, *ApJ*, 641, 773-784
41. "Inclination-Dependent Extinction Effects in Disk Galaxies in the Sloan Digital Sky Survey." Cayman T. Unterborn & Barbara S. Ryden, 2008, *ApJ*, 687, 976

42. "Relative Orientation of Pairs of Spiral Galaxies in the Sloan Digital Sky Survey." Jesse Buxton & Barbara S. Ryden, 2012, ApJ, 756, 135
43. "The Green Valley: Separating Galaxy Populations in Color-Magnitude Space." Derrick James & Barbara S. Ryden, 2017, in preparation

Other works

1. "The Forms of Galaxy Haloes in Universes Dominated by Heavy Neutral Particles." B. S. Ryden & J. E. Gunn, 1984, BAAS, 16, 487 (abstract)
2. "The Formation of Galactic Halos in Universes Dominated by Cold Dark Matter." Barbara S. Ryden & James E. Gunn, 1987, in *Dark Matter in the Universe, IAU Symposium 117*, ed. J. Kormendy & G. R. Knapp (Dordrecht: Reidel), p. 364 (abstract)
3. "The Milky Way and Mankind: from Myth to Science." Barbara S. Ryden, 1987, StarDate, 15, January, p. 6-8
4. *Galaxy Formation by Gravitational Collapse in a Universe Dominated by Cold Dark Matter*. Barbara Sue Ryden, 1987, PhD thesis, Princeton University
5. "The Phantom Moon of Venus." Barbara Ryden, 1987, StarDate, 15, August, p. 4-5
6. "The Astronomical Odyssey of Monsieur Le Gentil." Barbara S. Ryden, 1988, Griffith Observer, 52, February, p. 3-10
7. "The Area of Isodensity Contours in Gaussian and non-Gaussian Fields." Barbara S. Ryden, 1988, PASP, 100, 1360-63
8. "The Astronomer and the Guillotine." Barbara Ryden, 1989, StarDate, 17, Jan-Feb, p. 16-18
9. "The Great Moon Hoax." Barbara S. Ryden, 1989, StarDate, 17, May-Jun, p. 16-17
10. "The Galaxy Next Door." Barbara Ryden, 1989, StarDate, 17, Sep-Oct, p. 21-22
11. "The Earl and the Leviathan." Barbara S. Ryden, 1989, Griffith Observer, 53, November, p. 2-14
12. "Silent Star: The Life of John Goodricke." Barbara Ryden, 1989, StarDate, 17, Nov-Dec, p. 8-9
13. "Spots on the Sun." Barbara Ryden, 1990, StarDate, 18, Jan-Feb, p. 19-20
14. "Alfonso the Wise." Barbara Ryden, 1990, StarDate, 18, Mar-Apr, p. 16-17
15. "Adam Schall: An Astronomer in China." Barbara Ryden, 1990, StarDate, 18, May-Jun, p. 16-17
16. "The Trials and Triumphs of Mary Somerville." Barbara Ryden, 1990, StarDate, 18, Sep-Oct, p. 8-9
17. "The Origin of the Telescope." Barbara Ryden, 1990, StarDate, 18, Nov-Dec, p. 8-9

18. "Domain Walls and Large Scale Structure." Barbara S. Ryden, 1991, in *Proceedings of the Workshop on Large-Scale Structures and Peculiar Motions in the Universe*, ed. D. W. Latham & L. N. da Costa (San Francisco: Astronomical Society of the Pacific), p. 327-31
19. "On the Intrinsic Shape of Elliptical Galaxies." B. S. Ryden, 1991, BAAS, 23, 1457 (abstract)
20. "The Formation and Evolution of Domain Walls." W. H. Press, B. S. Ryden, & D. N. Spergel, 1991, in *High Energy Astrophysics. American and Soviet Perspectives*, ed. W. H. G. Lewin, et al. (Washington, DC: National Academy Press), p. 322-28
21. "Cosmology, Galaxy Formation." Barbara Ryden, 1992, in *The Astronomy and Astrophysics Encyclopedia*, ed. S. P. Maran (New York: Van Nostrand Reinhold), p. 156-57
22. "The Amazing Cassinis." Barbara Ryden, 1994, StarDate, 22, Jan-Feb, p. 16-18
23. "Expansion of Axisymmetric Voids." Barbara S. Ryden, 1994, in *Cosmic Velocity Fields*, ed. F. R. Bouchet & M. Lachièze-Rey (Gif-sur-Yvette, France: Editions Frontières), p. 573-4 (abstract)
24. "The Cosmological Distortion of Voids in Redshift Space." B. S. Ryden, 1994, BAAS, 26, 1407 (abstract)
25. "Sticky Particle Simulations of Counterrotating Disk Formation." A. R. Thakar & B. S. Ryden, 1994, BAAS, 26, 1441 (abstract)
26. "Cosmological Distortions in Redshift Space." B. S. Ryden, 1995, BAAS, 27, 849 (abstract)
27. "NGC 4138 – A Smoking Gun for Counterrotating Disk Formation." A. R. Thakar, B. S. Ryden, K. P. Jore, & A. H. Broeils, 1995, BAAS, 27, 1442 (abstract)
28. "The Shapes of Dense Molecular Cloud Cores." B. S. Ryden, 1996, BAAS, 28, 886 (abstract)
29. "Captain Cook and Mister Green." Barbara Ryden, 1997, StarDate, 25, Mar-Apr, p. 4-9
30. "Dwarf Elliptical and Dwarf S0 Galaxies in the Virgo Cluster." Barbara S. Ryden, Donald M. Terndrup, Richard W. Pogge, & Tod R. Lauer, 1997, in *The Second Stromlo Symposium: The Nature of Elliptical Galaxies*, ed. M. Arnaboldi, G. S. Da Costa, & P. Saha (San Francisco: Astronomical Society of the Pacific), p. 283-6
31. "Star-crossed Constellations." Barbara Ryden, 1997, StarDate, 25, Nov-Dec, p. 15-19
32. "SPH Simulations of Counterrotating Disk Formation in Spirals." A. R. Thakar & B. S. Ryden, 1997, BAAS, 29, 1332 (abstract)
33. "A Rock-Solid Case." Barbara Ryden, 1998, StarDate, 26, Nov-Dec, p. 4-7

34. “The Formation of Kinematically Decoupled Bulges and Cores in Spirals.” A. R. Thakar & B. S. Ryden, 1998, BAAS, 30, 1408 (abstract)
35. “The Shapes of Elliptical Galaxies with Massive Dark Objects and Central Density Cusps.” Barbara S. Ryden, 1999, in *Galaxy Dynamics*, ed. D. Merritt, J. A. Sellwood, & M. Valluri (San Francisco: Astronomical Society of the Pacific), p. 142-45
36. “A Theoretical Framework for Interpreting Principal Component Analysis of the Properties of Galaxies.” A. Conti, B. S. Ryden, & D. H. Weinberg, 1999, BAAS, 31, 1387 (abstract)
37. “Tough Little German Sister.” Barbara Ryden, 2000, StarDate, 28, May-Jun, p. 4-9
38. “The Size and Shape of Voids in Three-Dimensional Galaxy Surveys.” J. D. Schmidt, B. S. Ryden, & A. L. Melott, 2000, BAAS, 32, 684 (abstract)
39. “The Age – Shape Relation for Elliptical Galaxies.” B. S. Ryden, D. A. Forbes, & A. I. Terlevich, 2000, BAAS, 32, 717 (abstract)
40. “The Morphological Evolution of Merger Remnants.” Barbara Ryden & Jeremy Tinker, 2002, in *The Shapes of Galaxies and Their Halos*, ed. P. Natarajan (Singapore: World Scientific), p. 132-39
41. “Evolution of Merger Remnants with Supermassive Black Holes.” Jeremy Tinker & Barbara Ryden, 2003, in *Astrophysical Supercomputing Using Particle Simulations, IAU Symposium 208*, ed. J. Makino & P. Hut (San Francisco: Astronomical Society of the Pacific), p. 455-56.
42. “Life and Work of Gerard Kuiper.” Barbara Ryden, 2005, StarDate, 33, Nov-Dec, p. 16-19
43. “A Planet is a Planet is a Planet...or is It?” Barbara Ryden, 2007, StarDate, 35, Mar-Apr, p. 4-7
44. “Galaxy Orientation and Alignment Effects in the SDSS DR6.” Robert Siverd, Barbara S. Ryden, & B. Scott Gaudi, 2009 (arXiv:0903.2264)
45. *Instructor Solution Manual for Foundations of Astrophysics*. Barbara Ryden, Bradley M. Peterson, & Jessica Orwig, 2010 [Online publication]
46. “The Pen is Migher than the Telescope.” Barbara Ryden, 2011, StarDate, 39, Mar-Apr, p. 4-9
47. “Tuning in to the Radio Universe.” Barbara Ryden, 2011, StarDate, 39, Nov-Dec, p. 16
48. “Henrietta and the Cepheids.” Barbara Ryden, 2012, StarDate, 40, Mar-Apr, p. 4
49. “Book Review: The Construction of the Heavens.” Barbara Ryden, 2013, Physics in Perspective, 15, 125
50. “Great Walls and the Large-scale Structure of the Universe.” Barbara Ryden, 2015, in *Discoveries in Modern Science: Exploration, Invention, Technology*, ed. James Trefil, (Farmington Hills: Macmillan)

51. “Heavy Elements.” Barbara Ryden, 2015, in *Discoveries in Modern Science: Exploration, Invention, Technology*, ed. James Trefil, (Farmington Hills: Macmillan)
52. “Big Bang.” Barbara Ryden, 2015, in *Discoveries in Modern Science: Exploration, Invention, Technology*, ed. James Trefil, (Farmington Hills: Macmillan)
53. *Instructors’ Manual for Introduction to Cosmology*. Barbara Ryden, 2017 [Online publication]
54. “The Constant Conflict.” Barbara Ryden, 2017, *Nature Physics*, 13, 314

Last update: 2017 Jul 5