

Gregory D. Bothun - as of 2011

University of Oregon
Department of Physics
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Personal Profile:

- 29 years experience as a NASA contractor with various NASA science missions.
- 193 refereed publications
- Supervised 21 PHD students since 1988
- Author of Graduate Level Textbook: *Modern Cosmological Observations and Problems* (1998)
- Author of Undergraduate Textbook: *Cosmology: Mankind's Grand Investigation* (1999)
- Have taught **97 classes in 60 assigned terms** involving 19 different course titles
- Approximately 25 popular articles in newspapers/magazines/professional blogs
- Over 3 million dollars in combined grants from NSF and NASA since 1986
- Inaugural Member of ISI Highly Cited Researcher in the Area of Space Science
- Phi Beta Kappa Visiting Scholar 2001-2002
- Chair of first National workshop on Advanced Computing and Alternative Energy (September 2007)
- Early adopter of Instructional Technology (beginning in 1993) -produced a full suite of interactive simulations and java applets (<http://jersey.uoregon.edu>); designed and implemented one of the first wireless laptop classrooms in Higher Ed (2001)
- Launched perhaps the first Science Education Outreach Website - the Electronic Universe, on Feb 7, 1994 (<http://zebu.uoregon.edu>)
- Have taught 183 (yes that is correct) ON line classes since Spring term 1996
- Active in K12 science teacher professional development over the last 20 years
- Supervise Pine Mountain Observatory outreach and classroom visitation programs
- Have given over 100 public lectures at various venues
- Exercised leadership in the development of the Environmental Studies and Environmental Sciences programs at the University of Oregon
- Extensively involved with the Reinvention Center in the effort to reform Undergraduate Education
- NASA Space Grant Representative for University of Oregon

Education

BS: University of Washington, Seattle WA June 1976

PHD: University of Washington, Seattle WA August 1981

Research Profile (for marketing purposes only)

Research Profile:

During the period 1980-2000 G. Bothun published 160 articles in the peer-reviewed literature. This record of productivity and the subsequent citation of these papers lead to Bothun being inducted as an inaugural member (in 2002) of the ISI Highly cited researcher in Space Sciences which recognizes the top 0.5% of all cited international scholars in the field of Space Sciences. During this same time period, Bothun produced 15 Ph.D students in observational astrophysics. In addition, Bothun wrote a graduate level textbook (*Modern Cosmological Observations and Problems*) which sold out its first printing and, also predicted that the Cosmological Constant must be part of the real cosmology at work, approximately 1 year before there was credible observational evidence in favor of it.

During this period of performance, Bothun was involved in many collaborations that resulted in many breakthrough moments in Extragalactic (the study of objects outside of our Galaxy) Astronomy. These moments include:

- The recognition of an entirely new class of galaxies called Low Surface Brightness galaxies.
- A high quality characterization of the large scale density field (e.g. large scale structure) and subsequent measures of the matter density of the Universe.
- An integrated method of determining the distance scale of the Universe and its overall geometry
- A thorough characterization of the properties of Galaxies that host Quasars that lead to a much better physical understanding of these phenomena.
- Assembling a very large, multiwavelength database of the properties of galaxies in clusters of galaxies to better characterize the role that environment plays in determining galaxy evolution.
- Opening up new wavelength windows in which to observe various types of galaxies by consistently being on the forefront of new instrumentation.

Overall Bothun's work is characterized by innovative observations using then state of the art equipment convolved with a high ability to analyze large and complex data sets using clever statistical techniques. In recent years, he has taken that skill set and applied it to new research areas involving the characterization of climate change as well as the characterization of various forms of alternative energy production as scalable solutions to the coming world energy/electricity production problem

Professional Employment

1. Scientific Programmer: The Very Large Array Radio Telescope NRAO 1977
2. The University of Washington, Astronomy Instructor 1980-1981
3. Harvard-Smithsonian Center for Astrophysics, Center Research Fellow 1981--83
4. California Institute of Technology, Bantrell Research Fellow 1983--86
5. The University of Michigan, Assistant Professor in Astronomy (1986--1989)
6. The University of Michigan, Associate Professor in Astronomy (1989--1990)
7. The University of Oregon, Associate Professor in Physics (1990--1995)
8. The University of Oregon, Professor in Physics (1995--present)
9. The University of Oregon, Professor in Environmental Studies (2000—present)

Other Professional Experience

- Director, University of Oregon Pine Mountain Observatory (1990 – present)
- Chair/Co-chair of University of Oregon Educational Technology Committee 1995-2006
- Scientific Editor, The Astrophysical Journal (1996---2002)
- National Academy of Sciences Decadal Panel (1997—2000)
- Phi Beta Kappa Visiting Scholar 2000---2001
- Chair of DOE Workshop on Computational Needs in Alternative Energy (2007)

Professional Expertise

- Galaxy formation and evolution
- Galaxies of Low Surface Brightness
- Large Scale Structure in the Universe
- Observational Cosmology
- Digital Signal Processing
- Data mining and informatics
- UNIX systems administration
- Regional and Global Climate Change
- Hurricane formation and evolution
- Sustainable Energy Technologies and Energy Policy
- Applications of Instructional Technology
- Collaborative Teaching and Learning and Classroom Design
- Earth and Space Science Literacy for K12 teachers

Professional Societies

- American Astronomical Society
- Association for Environmental Studies and Sciences

Graduate Student Production History

PHD

	Student Name	PHD Year/University	Subject	Current Status
1	Eric P. Smith	1988/Univ. of Maryland	Astronomy	NASA Program Scientist Webb Space Telescope
2	Mark E. Cornell	1989/Univ. of Arizona	Astronomy	Systems Scientist Hobbs Eberly Telescope
3	Joe Mazzarella	1989/Univ. of Michigan	Astronomy	NASA Scientist, Spitzer Space Telescope
4	Greg Aldering	1990/Univ. of Michigan	Astronomy	Staff Astronomer: LBL (cosmology)
5	David Silva	1991/Univ. of Michigan	Astronomy	Director, National Optical Astronomy Observatories (NOAO)
6	Ted von Hippel	1991/Univ. of Michigan	Astronomy	Professor, Sienna College
7	Susanna Deustua	1992/Univ. of Michigan	Astronomy	Instrument Scientist, Space Telescope
8	Diab Jerius	1992/Univ. of Michigan	Astronomy	Software Engineer, Smithsonian Astrophysical Observatory
9	Stacy McGaugh	1992/Univ. of Michigan	Astronomy	Professor, University of Maryland
10	Chris Mihos	1992/Univ. of Michigan	Astronomy	Professor, Case Western Reserve University
11	David Sprayberry	1994/ Univ. of Arizona	Astronomy	Upper Management at NOAO
12	Karen O' Neil	1997/Univ. of Oregon	Astronomy	Project Scientist National Radio Astronomy Observatory
13	Charles Beauvais	1997/Univ. of Oregon	Astronomy	Microsoft
14	Erwin de Blok	1997/Univ. of Groningen	Astronomy	Professor, University of Cape Town
15	Rachel Gibbons	2002/Univ. of Maryland	Astronomy	K12 Educator, Nashville TN
16	Christy Keeler	2003/Univ. of Oregon	Technology in Education	School District Administrator, Clark County Nevada
17	Joe Helmboldt	2005/Univ. of New Mexico	Astronomy	Astronomer, Naval Research Lab
18	Laura Riihimaki	2008/Univ. of Oregon	Climate Physics	Postdoc Pacific Northwest National Labs
19	Elsa Johnson	2010/Univ. of Oregon	Astronomy	Instructor, University of Oregon
20	Cullen Andrews	2011/Univ. of Oregon	Astronomy	

Masters Students

- 1. Paula White – University of Oregon (Physics) – MSc – 2002**
- 2. Karen Barrows – University of Oregon (Env. Studies) – MSc – 2003**
- 3. Sarah Mazze - University of Oregon (Env. Studies) – MSc – 2006**

Honors College Theses

1. Assessing the Robustness of the Pacific Northwest Index and Its Potential to Predict Pacific Northwest Climate Variation

Year: 2005 Author: Rogers III, Harvey W.

Thesis Quality: Pass with Distinction (only 5-10% of all HC theses are in this category)

2. On the Road to Replacing Oil: A Well-to-Wheels Study Exploring Alternative Transportation Fuels and Vehicle Systems

Year 2006 Author: Jenkins, Jesse D.

Thesis Quality: Pass with Distinction

3. Petroleum Exploitation and Indigenous Sovereignty in the Ecuadorian Amazon: Seeking a Balance Between Development and Conservation

Year 2006 Author: Bliss, Jessica R

Thesis Quality: Pass with Distinction

4. The Distribution Patterns of Arthropods in Forest Canopy

Date: November 2006 Author: Luftig, Alexandria S.

Thesis Quality: Pass with honors

5. Analysis of the Kyoto Protocol's Clean Development Mechanism in China

Date: 2008 Author: Sneed, Joseph

Thesis Quality: Pass

6. A Biological Analysis of the Impact of Oil Drilling Platforms and Pipeline Delivery in the Ecuadorian Amazon

Date: 2009 Author: Buxton, Heather

Thesis Quality: Pass with Distinction

7. Fuel from Biomass: Evaluating the Potential Yield of Cellulosic Ethanol for the State of Oregon

Date: 2009 Author: Bairstow, Tommy

Thesis Quality: Pass with Distinction

8. Are Atlantic Basin Hurricane Properties Changing over Time?

Date: 2009 Author: Chi, Emily

Thesis Quality: Pass with Distinction

9. Balancing the Grid: How to Implement Alternative Energy

Date: 2010 Author: Geiselman, Sybil

Thesis Quality: Pass with honors

10. Government Subsidies to Large Scale Renewable Energy Infrastructure

Date: 2010

Author: Parikh, Ravi.

Thesis Quality: Pass

11. Regional Climate Change in Northeast United States

Date: 2010 Author: Wilkie, Adrienne

Thesis Quality: Pass with Distinction

12. Tropical Rainfall variations in the 2005 Atlantic Basin Hurricane Season

Date: 2011 Author: Russel, Alexi

Thesis Quality: Pass with Honors

13. The Myth of Natural Capitalism
 Date: 2011 Author: Lentz, Sterling
 Thesis Quality: Pass

14. College Campuses and Green Energy
 Date: 2011 Author: Rainbowlight, Isha
 Thesis Quality: Pass with Honors

Academic Year Classroom Teaching Portfolio 1990-2011

Course Number and Description	Physical /Online	Notes
Astronomy 121: The Solar System	4/27	College Scholars Course
Astronomy 122: Stars and Stellar Evolution	10/13	Heavy use of authentic data exercises and simulations
Astronomy 123: Cosmology and the Origin of Life	8/25	My version of this course is much different than standard
Astronomy 321: Introduction to Astrophysics	4	Created this course initially
ENVS 202: Introduction to Natural Science	6/4	Created this course initially
ENVS 350: The Ecological Footprint of Energy Generation	6	I created and developed this course initially
ENVS 355: Environmental Data and Models	7	Created this course initially
Honors College 434/441: Topics in Global Energy Generation and Policy	9	I created and developed this course initially
Honors College 434/441: Topics in Global Climate Change and Policy	3	I created and developed this course initially
Physics 101/102: Essentials of Physics	3/11	
Physics 155: Physics of the Internet	2/2	Created this course initially
Physics 161: Energy and Environment	6/7	
Physics 162: Sustainable Energy	6/31	Popular ON line course now
Physics 301: Physicist's View of Nature	2/11	Mostly teach ON line
Physics 311: Atmospheric Dynamics	2	Course no longer exists
Physics 361: Science and Culture	9	Co-teach with J. Nicols
Physics 610: Advanced Astrophysics	3	
Physics 199: Freshmen Seminar	5	Most recent one was Fall 2000
ENVS 610: Human/Science Interface	2	For ENVS Masters students

Invited Talks 1990 - present (Incomplete list)

- **University of Toledo, Toledo, OH; May 1990**
- **Kiwanis Club Eugene OR August 1990**
- **Oregon State University, Corvallis OR; November 1990**
- **WISTEC Eugene OR November 1990**
- **OMSI, Portland OR November 1990**

- **Textronix, Beaverton OR February 1991**
- **Pacific Lutheran University – March 91**
- **Sunriver Nature Center, Sunriver OR July 1991**
- **University of Washington – November 1991**
- **Lawrence Livermore Labs, Berkely CA January 1992**
- **Univ. of California, Santa Barbara May 1992**
- **University of Victoria, Victoria BC May 1992**
- **Western Oregon State College October 1992**
- **Reed College March 1993**
- **UO Alumni Association, Portland OR March 1993**
- **University of Pittsburgh March 1993**
- **University of Kentucky April 1993**
- **University of California, Santa Cruz May 1993**
- **OMSI, Portland OR May 1993**
- **Timerline Lodge, OR Oct 1993**
- **University of Oxford, Oxford England Dec 1993**
- **Berkeley and Livermore Labs Jan 1994**
- **National Science Teachers Association Meeting Portland OR Oct 1994**
- **OMSI, Portland OR Oct 1994**
- **University of British Columbia April 1995**
- **Western Oregon State College Oct 1995**
- **University of Victoria Nov 1995**
- **Oregon State University Dec 1995**
- **Silicon Graphics Corporate HQ Feb 1996**
- **Johns Hopkins University Mar 1996**
- **WISTEC , Eugene OR Oct 1996**
- **University of Toronto Jan 1997**
- **National Science Board Feb 1997**
- **Johns Hopkins University March 1997**
- **Linfield College, McMinnville OR April 1997**
- **Southern Oregon University May 1997**
- **CAS External Advisory Group – Bend OR May 1997**
- **Visiting Scientist, University of Groningen 3 weeks in Sept 1997**
- **New Mexico State University Oct 1997**
- **Kansas State University Jan 1998**
- **AAPT Invited Speaker Feb 1998, New Orlenas**
- **Duke University April 1998**
- **University of Victoria April 1998**
- **University of Cardiff, Wales July 1998**
- **Microsoft Learning Technologies Group Sept 1998**
- **Case Western Reserve University, Oct 1998**
- **Whitman College April 1999**
- **OMSI, Portland OR July 1999**
- **Stanford University Feb 2000**
- **University of Minnesota March 2000**
- **University of North Carolina April 2000**
- **Columbia University April 2000**

- **Harvard University April 2000**
- **Lewis and Clark College, Portland OR, April 2000**
- **Ripon College, Ripon WI September 2000**
- **University of Puget Sound, Tacoma WA September 2000**
- **Claremont College, CA October 2000**
- **University of Washington Nov 2000**
- **Carnegie Mellon University Nov 2000**
- **University of Colorado Dec 2000**
- **University of South Dakota Feb 2001**
- **Augustine College, Rock Island, Illinois March 2001**
- **Washington and Jefferson College, Washington PA March 2001**
- **University of Colorado May 2001**
- **AAPT New College Teacher Workshop May 2001 College Park MD**
- **University of Michigan July 2001**
- **Willamette University, Salem OR Dec 2001**
- **Western Washington University, Bellingham WA May 2002**
- **Springfield Rotary, Springfield OR July 2002**
- **University of Colorado August 2002**
- **University of Wisconsin-Madison September 2002**
- **University of Maryland Sep 2002**
- **Distinguished Phillips Visitor, Haverford College December 2002**

Note: After 2002 I begin to grow quite weary of travel and tended to say no to all requests. A partial list of post 2002 acceptances is given below.

- **Western Washington University May 2003**
- **University of Puget Sound, September 2003**
- **OMSI, Portland OR Feb 2004**
- **CAS Development Group, Bend OR August 2004**
- **CAS Development Group Bend OR August 2005**
- **Case Western University External Program Committee 2005**
- **University of Puget Sound Sep 2005**
- **Rice University November 2005**
- **Baker Center, Eugene OR March 2006**
- **Lewis and Clark College, October 2006**
- **Reinvention Center Meeting Washington DC Nov 2006**
- **Eugene Rotary Club Feb 2007**
- **Eugene City Club April 2007**
- **Keynote talk at ELI Conference in San Antonio TX – Jan 2008**
- **Keynote talk in honor of Scientific Contributions of Stephen E. Strom - Tucson AZ – April 2008**
- **Instructional Technology Conference in Nashville TN March 2009**
- **Reinvention Center Meeting University of Miami 2009**
- **National Space Grant Meeting, Portland Oregon October 2009**

- **AAPT meeting Portland OR July 2010**
- **Session Leader Reinvention Center Meeting Washington DC Nov 2010**
- **Reed College Colloquium Dec 2010**
- **Willamette University Colloquium Feb 2011**
- **Public Lecture at Evergreen Space Museum, McMinnville OR Feb 2011**
- **University of Puget Sound Oct 2011**
- **American Physical Society Meeting, Corvallis OR Oct 2011**
- **University of Oregon Physics Colloquium Nov 2011**

Publications

Peer Reviewed Publications of G. Bothun (1977 – 2010)

Books/Edited Proceedings:

1. **Modern Cosmological Observations and Problems** -- a complete graduate level textbook focusing on the last 5 years worth of observational data. 291 pages. Published by Taylor and Francis, Ltd, London - **first printing March 1998**.
2. **Cosmology: Mankind's Grand Investigation** -- a 6 chapter Cosmology Supplement designed for Introductory Astronomy classes that are concerned with Cosmology. 135 pages. Published by Harcourt Brace College Publishers - **first printing January 1999**.
3. ChemConnections: **What's In a Star?** WWW Norton & Company **September 2004**
4. **Computational Research Needs in Alternative and Renewable Energy** – US Department of Energy Conference **September 2007**

(1977--1980) (3)

5. **A Search for Close Dwarf Companions of Elliptical Galaxies** Pub. Astronomical Society of the Pacific 89, 5-9 G. Bothun and W. Sullivan (1977).
6. **Are Anemic Spirals Deficient in Neutral Hydrogen?** Astrophysical Journal 242,903-912 (G. Bothun and W. Sullivan) (1980).
7. **A Distance Scale from the Infrared Magnitude/H I Velocity Width Relation III. The Expansion Rate Outside The Local Supercluster**, Astrophysical Journal 239,12-37 (M. Aaronson, J. Huchra, J. Mould, W. Sullivan, R. Schommer, and G. Bothun) (1980).

(1981-1985) (37)

8. **The X-Ray and Optical Characteristics of the Cataclysmic Variable V794 Aql** Astrophysical Journal (Letters) 249,L61-L64 (P. Szkody, L. Crosa, G. Bothun, R. Downes and R. Schommer) (1981).

9. **Spiral Galaxies in Clusters I. Neutral Hydrogen Observations in Abell 1367, Coma and Zwicky 74-23** *Astronomical Journal* 86,919-942 (W. Sullivan, G. Bothun, B. Bates, and R. Schommer) (1981).
10. **Spiral Galaxies in Clusters II. Neutral Hydrogen Observations in Cancer, Pegasus I and Hercules** *Astronomical Journal* 86,943-952 (R. Schommer, W. Sullivan and G. Bothun) (1981).
11. **The Peculiar Galaxy IC 1182** *Astrophysical Journal* 247, 42-47 (G. Bothun, J. Stauffer and R. Schommer) (1981).
12. **Detection of Extended Nebulosity and Neutral Hydrogen Emission in the Low Redshift QSO 0351 + 026** *Astrophysical Journal* 257, 40-46 (G. Bothun, W. Romanishin, B. Margon, R. Schommer and G. Chanan) (1982).
13. **The Peculiar Disk Galaxy U7576** *Astrophysical Journal (Letters)* 260, L37-L40 (J. Mould, B. Balick, G. Bothun and M. Aaronson) (1982).
14. **VLA Observations of the Giant Cluster Spiral UGC12423** *Astronomical Journal* 87,1098-1105 (G. Bothun, B. Balick and E. Skillman) (1982)
15. **The Evolution of Disk Galaxies and the SO Problem, Revisited** *Astrophysical Journal (Supplements)* 50,39-53 (G. Bothun) (1982)
16. **The Relationship between Morphological Type and Quantitative Measures for Cluster Spirals** *Pub. Astronomical Society of the Pacific* 94,774-788 (G. Bothun) (1982).
17. **Observations of Peculiar Galaxies in Clusters of Galaxies** *Astronomical Journal* 87, 1368-1373 (G. Bothun and R. Schommer) (1982).
18. **Spiral Galaxies in Clusters III. Gas Rich Galaxies in the Pegasus I Cluster of Galaxies** *Astronomical Journal* 87,725-730 (G. Bothun, R. Schommer and W. Sullivan) (1982).
19. **Spiral Galaxies in Clusters IV. The H I and Color Properties of Spirals in Nine Clusters** *Astronomical Journal* 87,731-738 (G. Bothun, R. Schommer and W. Sullivan) (1982).
20. **0351 + 026: A QSO Spawned by Interacting Galaxies?** *Astronomical Journal* 87, 1621-1627 (G. Bothun, J. Mould, T. Heckman, R. Schommer, B. Balick and J. Kristian) (1982).
21. **The Zwicky Magnitude Scale: How Reliable is in the Estimation of Blue Luminosity?** *Astrophysical Journal (Letters)* 255, L23-L27 (G. Bothun and R. Schommer) (1982).
22. **H I Absorption in the Peculiar Galaxy U6081** *Astrophysical Journal (Letters)* 267, L15-L18 (G. Bothun and R. Schommer) (1983).
23. **The Cancer Cluster: An Unbound Collection of Groups** *Astrophysical Journal* 268, 47-55 (G. Bothun, M. Geller, T. Beers and J. Huchra) (1983).
24. **The Chemical Composition in Distant Globular Clusters: Are There Any Metal-Poor Clusters?** *Astrophysical Journal* 273,187-194 (C. Pilachowski, G. Bothun, E. Olszewski and A. O'Dell) (1983).
25. **Very Red, Yet H I Rich Galaxies** *Astronomical Journal* 88,577-582 (R. Schommer and G. Bothun) (1983).
26. **An Unsuccessful Search for Very Extended Halos Around M61 and NGC 1300** *Pub. Astronomical Society of the Pacific* 96.583-587 (G. Bothun, B. Margon and B. Balick) (1984).
27. **CCD Imaging and Neutral Hydrogen Observations of IZwI and Other Low Redshift QSOs/AGNs** *Astronomical Journal* 89, 1293-1299 (G. Bothun, T. Heckman, R. Schommer and B. Balick) (1984).
28. **A Possible Relationship Between Metal Abundance and Luminosity for Disk Galaxies** *Astronomical Journal* 89, 1300-1309 (G. Bothun, W. Romanishin and S. Strom) (1984).
29. **A Redshift Survey of the Poor Cluster A1142** *Astronomical Journal* 89,319-322 (M. Geller, T. Beers, G. Bothun and J. Huchra) (1984).
30. **Low Redshift QSOs as the Active Nuclei of Interacting Galaxies: A Spectroscopic Investigation** *Astronomical Journal* 89,958-965 (T. Heckman, G. Bothun, B. Balick and E. Smith) (1984).
31. **H-Alpha Observations of Spiral Galaxies in Cancer, A1367 and Coma** *Astronomical Journal* 89, 1279-1287 (R. Kennicutt, G. Bothun and R. Schommer) (1984).
32. **Metallicity Estimates for H II Regions in M81** *Astronomical Journal* 89, 1702-1704 (J. Stauffer and G. Bothun) (1984).
33. **Searching for the Optimal Means of Comparative H I Analysis** *Astrophysical Journal* 277,532-541 (G. Bothun) (1984).
34. **The Properties and Distances of a Sample of Sc I Galaxies** *Astrophysical Journal* 278,475-485 (G. Bothun, M. Aaronson, R. Schommer, J. Huchra and J. Mould) (1984).
35. **Spiral Galaxies in Clusters V. Radial Gradients in Coma and A1367** *Astronomical Journal* 89,466-474 (G. Bothun, R. Schommer and W. Sullivan) (1984).
36. **Infrared Photometry and Optical Spectroscopy of Dwarf Galaxies in the Virgo Cluster** *Astrophysical Journal* 280,528-531 (G. Bothun and N. Caldwell) (1984).
37. **A Catalog of Radio, Optical and Infrared Observations of Spiral Galaxies in Clusters** *Astrophysical Journal Supplement* 57,423-472 (G. Bothun, M. Aaronson, R. Schommer, J. Mould, J. Huchra and W. Sullivan) (1985).

38. **The Infrared Color-Magnitude and Color-Gas-Content Relations for Cluster Spirals** *Astrophysical Journal* 291,586-594 (G. Bothun, J. Mould, R. Schommer and M. Aaronson) (1985).
39. **An Investigation of the Properties of Dwarf Galaxies in the Virgo Cluster** *Astronomical Journal* 90, 697-707 (G. Bothun, J. Mould, A. Wirth, and N. Caldwell) (1985).
40. **A Constraint on the Infall of H I into Big Disk Galaxies** *Astronomical Journal* 90, 1982-1988 (G. Bothun) (1985).
41. **A Redshift Survey of Low Surface Brightness Galaxies I. The Basic Data** *Astronomical Journal* 90, 2487-2494 (G. Bothun, T. Beers, J. Mould and J. Huchra) (1985).
42. **The Peculiar X-ray and Radio Star AS431** *Nature* 313,376-378 (J. P. Caillault, G. Chanan, D. Helfand, J. Patterson, J. Nousek, L. Takalo, G. Bothun, and R. Becker) (1985).
43. **Globular Clusters in Galaxies Beyond the Local Group VI: The Spiral Galaxy NGC 2683** *Astronomical Journal* 90, 2495-2498 (H. Harris, J. Hesser, G. Bothun, D. Hanes and W. Harris) (1985).
44. **The Effect of Local Galaxy Density on the Radio Emitting Properties of Galaxies** *Astrophysical Journal* 288,122-131 (T. Heckman, T. Carty, and G. Bothun) (1985).

(1986--1990) (45)

45. **Galaxy Collisions and Mergers: The Genesis of Very Powerful Radio Sources?** *Astrophysical Journal* 311,526-547 (T. Heckman, E. Smith, S. Baum, W. van Bruegel, G. Miley, G. Illingworth, G. Bothun and B. Balick) (1986).
46. **U8508 - A Dwarf Galaxy Associated with the M101 Group** *Pub. Astronomical Society of the Pacific* 98,732-739 (J. Mould, D. Schneider, P. Harding and G. Bothun) (1986).
47. **H I Synthesis Observations of Two Low Surface Brightness Dwarf Galaxies in Virgo** *Astronomy and Astrophysics* 165, 45-52 (E. Skillman and G. Bothun) (1986).
48. **On The Nature of the Host Galaxies of QSOs** *Astrophysical Journal* 306,64-89 (E. Smith, T. Heckman, G. Bothun, W. Romanishin, and B. Balick) (1986).
49. **A Distance Scale from the Infrared Magnitude/H I Velocity Width Relation V: Distance Moduli to Ten Galaxy Clusters and Positive Detection of Bulk Supercluster Motion Toward the Microwave Anisotropy** *Astrophysical Journal* 302,536-563 (M. Aaronson, G. Bothun, J. Mould, J. Huchra, R. Schommer and M. Cornell) (1986).
50. **Blue Disk Galaxies in Coma: Analogs to $z = 0.5$ Cluster Members?** *Astrophysical Journal* 301, 57-64 (G. Bothun and A. Dresser) (1986).
51. **CCD Two Color Mapping of the Remarkable Irregular Galaxy NGC 4449** *Astronomical Journal* 91,507-516 (G. Bothun) (1986).
52. **A Redshift Survey of Low Surface Brightness Galaxies II: Do They Fill the Voids?** *Astrophysical Journal* 308,510-529 (G. Bothun, T. Beers, J. Mould and J. Huchra) (1986).
53. **Comparative Photometric Parameters of Dwarf Irregular and Elliptical In the Virgo Cluster: Two Different Classes of Dwarf Galaxies?** *Astronomical Journal* 92, 1007-1019 (G. Bothun, J. Mould, N. Caldwell and H. MacGillivray) (1986).
54. **1E 1415.6 +2257: An X-ray Selected BL Lac Object in a Luminous Galaxy** *Astrophysical Journal* 302,711-717 (J. Halpern, C. Impey, G. Bothun, S. Tapia, A. Wilson and E. Skillman) (1986).
55. **Optical Observations of SN 1987D in UGC 7370** *P.A.S.P* 99,1167-1173 (D. Schneider, J. Mould, A. Porter, M. Schmidt, G. Bothun and J. Gunn) (1987).
56. **Sources of Scatter in the Tully-Fisher Relation and Their Minimization Through the Use of CCD I-Band Surface Photometry of Spiral Galaxies** *Astrophysical Journal* 313,629-643 (G. Bothun and J. Mould) (1987).
57. **Discovery of a Huge Low Surface Brightness Galaxy: A Proto-disk Galaxy at Low Redshift?** *Astronomical Journal* 94, 23-29 (G. Bothun, C. Impey, D. Malin and J. Mould) (1987).
58. **Dwarf Elliptical Galaxies in the Fornax Cluster II. Their Structure and Stellar Populations** *Astronomical Journal* 94, 1126-1142 (N. Caldwell and G. Bothun) (1987).
59. **Isophotal Diameters of Cluster Spirals** *Astrophysical Journal Supplements* 64,507-528 (M. Cornell, M. Aaronson, G. Bothun and J. Mould) (1987).
60. **A Dwarf Galaxy with Seyfert Characteristics** *Astronomical Journal* 93, 29-32 (D. Kunth, W. Sargent, and G. Bothun) (1987).
61. **** Musings Concerning the Possible Significance of Surface Brightness Variations in Disk Galaxies in Nearly Normal Galaxies: From the Planck Time to the Present** p. 184-194
62. **The Methodology and Reliability of Determining Bulge-to-Disk Ratios for Spiral Galaxies** *Astronomical Journal* 93, 60-73 (J. Schombert and G. Bothun) (1987).
63. **Neutral Hydrogen Observations of Four Dwarf Galaxies in the Virgo Cluster** *Astronomy and Astrophysics* 185, 61-76 (E. Skillman, G. Bothun, M. Murray and R. Warmels) (1987).

64. **The Neutral Hydrogen Content of Very Red Spirals** *Astronomy and Astrophysics* 177,63-70 (T. van der Hulst, E. Skillman, R. Kennicutt and G. Bothun) (1987).
65. **A Catalog of Low Surface Brightness Objects I: Dec Zone 20** *Astronomical Journal* 95, 1389-1399 (J. Schombert and G. Bothun) (1988).
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161. **The Baryonic Tully Fisher Relation** The Astrophysical Journal (Letters) 533, L99-102 (S. McGaugh, J. Schombert, G. Bothun and E. DeBlok) (2000).
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169. **Far Ultraviolet and H-alpha Imaging of Nearby Spirals: The OB Stellar Population in the Diffuse Ionized Gas** The Astrophysical Journal 559 878 (C. Hoopes, R. Walterbos and **G. Bothun**) (2001).
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188. **An Electric Force Facilitator in Descending Vortex Tornadogenesis** Journal of Geophysical Research- Atmospheres 113, D07106 (F. Patton, **G. Bothun** and S. Sessions) (2007)
189. **The Dependence of H II Region Properties on Global and Local Surface Brightness Within Galaxy Discs** Monthly Notices of the Royal Astronomical Society 393.478 (Helmholtz et al.) (2009)
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191. **The Buried Starburst in the Interacting Galaxy II ZW 096 as Revealed by the Spitzer Space Telescope** The Astronomical Journal 140, 63 (Inami etal) (2009)
192. **The Great Observatories All-Sky LIRG Survey: Comparison of Ultraviolet and Far-Infrared Properties** The Astrophysical Journal 715, 572 (Howell etal) (2009)
193. **The Spatial Extent of (U)LIRGs in the mid-Infrared I: The Continuum Emission** in press (Diaz-Santos etal 2010)
194. **Investigation of Dual Active Nuclei Outflows, Shock Heated Gas and Young Star Clusters in Markarian 266,** The Astrophysical Journal in press (Mazarella etal) (2012)
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Grants and Contracts

Amount	Dates	Grantor	Title
8,000	2011-12	NASA	TRMM Data Analysis for the 2005 Hurricane Season
56,000	2010-11	State Of	STEM Partnership with Woodburn School District

16,000	2009	Oregon UO	Lokey Curriculum Grant
33,000	2008-09	NASA	Do the Disks of Galaxies really ever end?
82,000	2007-09	NASA	Research and Public Outreach at the Pine Mountain Observatory
90,000	2005-08	State of Oregon	Highly Qualified Science Teacher Initiative: Math Science Partnership Program
27,000	2003-05	NASA	A New Member of the Local Group
470,000	2002-06	NSF	Data Driven Inquiry and Collaborative Learning: Using Technology to Transform Teaching and Learning
47,000	2002-03	NASA	Age Dating Merger Remnants
28,000	2000-02	Murdock	Partners in Science Program. Two Awards Made to Work With Two High School Science Teachers
50,000	1999-00	NASA	The Distance to NGC 2841: Improving the TF Calibration and Definitely Testing Mond
234,000	1998-02	NSF	The Creation of Network Interactive Tools for Teaching Physics and Astronomy
39,900	1998-00	NASA	Science by Doing: The Role of Digital Technology in Inspiring Curiosity and Discovery
65,000	1998-00	NSF	An Integrated Circuit Fabrication and Characterization Laboratory
350,000	1998-00	NSF	Connecting the University of Oregon to the vBNS
3,000	1998-99	NWACC	Science by Doing: The Role of Digital Technology in Inspiring Curiosity and Discovery
34,000	1998-99	NASA	HCG 90: The Formation of the X-ray Medium
500,000	1997-02	NSF	Recognition Award for the Integration of Research Into Teaching
152,000	1997-01	NSF	The Properties of Low Surface Brightness Galaxies
50,000	1997-98	Murdock	Next Generation 3D Visualizations in Astrophysics and the Geological Sciences
440,000	1997-98	NSF-ARI	A High Speed Geophysical and Astrophysical Visualization Laboratory
89,500	1996-98	SUN Microsystems	Network Delivery of Science Curriculum
14,500	1997-98	NASA	The Stellar Populations of Low Surface Brightness Galaxies
30,000	1995-98	NASA	Establishing IP Connectivity to the Pine Mountain Observatory
42,000	1995-96	OSSHE	The Development of Networked Interactive Experiments in Physics
28,000	1995-96	NASA	Low Surface Brightness Galaxies in the UIT Data Base
117,000	1994-98	NASA	The Near UV Properties of Galaxies with Low Optical Surface Brightness
15,000	1994-95	OSSHE	Towards a Statewide Astronomy Curriculum
12,000	1994-95	Oregon Community Foundation	Public Education Program at Pine Mountain Observatory

26,000	1993-95	NSF	A CCD-Based Undergraduate Astronomy Laboratory
20,000	1992-93	NASA	Soft X-ray Halos Around Low Mass Disk Galaxies
90,000	1990-93	NSF	The Properties of Low Surface Brightness Galaxies
3,258,900			