

R. DAVID BAKER

Austin College
Physics Department
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Education

UNIVERSITY OF CALIFORNIA, LOS ANGELES
Ph.D. in Geophysics & Space Physics, December 1997. Los Angeles, CA

UNIVERSITY OF CALIFORNIA, LOS ANGELES
M.S. in Geophysics & Space Physics, December 1993. Los Angeles, CA

UNIVERSITY OF TEXAS AT AUSTIN
B.S. with Highest Honors in Mathematics, December 1989. Austin, TX

Honors & Awards

Minnie Stevens Piper Texas Professor Award nominee, 2015.
Austin College Cindy Bean Service to Alumni Award, 2014.
Austin College Science Division Service Award, May 2013.
Microsoft Partners in Learning Daily Edventures Global Heroes in Education, 2012.
The Princeton Review's Best 300 Professors, 2012.
Most Creative Teacher in the South, Oxford American Magazine, 2011.
CASE Professor of the Year nominee, 2011.
Outstanding University Press Book for Public and University Libraries, 2011.
Bild der Wissenschaft Readers Choice "Knowledge Book of the Year", 2011.
PROSE Award Honorable Mention in Cosmology and Astronomy, 2010.
Austin College Science Division Service Award, May 2009.
Minnie Stevens Piper Texas Professor Award nominee, 2006.
Who's Who Among America's Teachers, 2003-2004.
Austin College Science Division Teaching Award, May 2002.
Austin College Student Assembly Faculty of the Month, December 2000.
UCLA Department of Earth & Space Sciences Ph.D. Candidate Fellowship, 1996-97
UCLA Department of Earth & Space Sciences Graduate Fellowship, 1990
Phi Beta Kappa National Honor Society, 1989
University of Texas at Austin College Scholar, 1988-89
UT College of Natural Sciences Dean's Scholar Program, 1988-89
Phi Kappa Phi National Honor Society, 1988
Who's Who Among Students in American Universities and Colleges, 1988
USAA Scholastic All-American, 1988
Golden Key National Honor Society, 1987
Pi Mu Epsilon National Mathematics Honor Society, 1987

Teaching Experience

<i>PROFESSOR OF PHYSICS</i>	Sep 2012—present
<i>ASSOCIATE PROFESSOR OF PHYSICS</i>	Sep 2005—Aug 2012
<i>ASSISTANT PROFESSOR OF PHYSICS</i>	Sep 2000—Aug 2005

Austin College

Physics Department, Sherman, TX

Teach major and non-major courses in physics and environmental studies. Courses include Workshop Physics, Modern Physics, Classical Mechanics, Computational Physics, Atmospheric Physics, The Most Extreme Places in Our Solar System, Global Climate and Extreme Weather, Science and Policy of Natural Disasters, and Nature and Culture of Peru, Ecuador, and the Galapagos. Implement innovative learning approaches into the physics curriculum, including project-based learning and physics portfolios.

ADJUNCT ASSISTANT PROFESSOR

Jan 1999—May 1999

College of Notre Dame of Maryland

Department of Mathematics, Physics, and Computer Science, Baltimore, MD

General Physics II. Taught course on waves, optics, and electricity and magnetism to science majors. Developed laboratory assignments, facilitated laboratory learning, and introduced student physics portfolios into the curriculum. Obtained very positive student evaluations.

GRADUATE TEACHING ASSISTANT

University of California, Los Angeles

Department of Earth & Space Sciences, Los Angeles, CA

Introduction to Oceanography.

Apr 1996—Jun 1996

Facilitated student learning in a laboratory setting. Developed and improved laboratory experiments and readings. Obtained very positive student evaluations.

Origin and Evolution of the Solar System.

Sep 1991—Dec 1991

Developed curriculum for newly formed laboratory course. Prepared laboratory exercises, course reading material, and course exams. Lectured in professor's absence. Obtained very positive student evaluations.

TEAM LEADER, GRAPHICS TECHNICAL SUPPORT GROUP. Jun 1989—Aug 1990

International Business Machines, Inc. (IBM), Roanoke, TX

Developed and taught graphics training seminars for IBM technical support representatives using multimedia presentation techniques.

Research Experience

ADAMS OBSERVATORY DIRECTOR

Aug 2013—present

Austin College, Sherman, TX

Manage the largest research telescope in North Texas for use in teaching, undergraduate research, and public outreach. Coordinate astronomy undergraduate research program. Organize regular observing sessions for Austin College community. Develop relationships with related organizations in astronomy education, research, and outreach.

AUSTIN COLLEGE WEATHER STATION MANAGER

Jan 2001—present

Austin College, Sherman, TX

Plan, manage, and implement the Austin College Weather Station. Develop data quality control and assurance procedures. Provide reliable weather information for the community.

Introduce undergraduates to environmental research through project-based special topics courses.

VISITING RESEARCH SCIENTIST

Jun 2001—July 2003

Mesoscale Atmospheric Processes Branch

NASA/Goddard Space Flight Center, Greenbelt, MD

Investigated heavy precipitation events for case studies of improved flood forecasting.

Improved 3-D atmosphere/land-surface model for cloud, precipitation, and land-surface studies.

ASSISTANT RESEARCH SCIENTIST

Feb 2000—Aug 2000

Joint Center for Earth Systems Technology

University of Maryland, Baltimore County

NASA/Goddard Space Flight Center, Baltimore, MD

Investigated cloud-scale and mesoscale atmospheric dynamics using a 3-D cloud-resolving numerical model with particular attention to land-atmosphere interaction, severe storms, and heavy precipitation.

RESEARCH METEOROLOGIST

Aug 1999—Sep 1999

NASA Tropical Rainfall Measuring Mission (TRMM) KWAJEX Field Experiment

Kwajalein, Marshall Islands

Launched radiosondes (weather balloons) to collect atmospheric data in support of NASA's TRMM satellite. Assessed weather conditions for radiosonde release. Performed on-site quality control of atmospheric data.

RESEARCH SCIENTIST

Nov 1997—Jan 2000

Universities Space Research Association

NASA/Goddard Space Flight Center, Greenbelt, MD

Investigated land-atmosphere interaction with particular attention to the role of soil moisture on precipitation processes. Coupled a 3-D cloud-resolving model with a sophisticated land-surface model. Analyzed meteorological data from rain gauge and radiosonde networks.

GRADUATE STUDENT RESEARCH ASSISTANT

Aug 1990—Oct 1997

University of California, Los Angeles

Department of Earth & Space Sciences, Los Angeles, CA.

Investigated atmospheric convection and gravity wave generation on Venus and Jupiter.

Developed and tested fully compressible convection code for massively parallel supercomputers. Analyzed data from Pioneer Venus and Galileo spacecraft missions.

Technical Experience*TECHNICAL SUPPORT REPRESENTATIVE*

Aug 1988—Aug 1990

IBM National Technical Support Center

International Business Machines, Inc. (IBM), Roanoke, TX

Assisted customers nationwide with technical questions concerning IBM personal computer hardware and software. Produced high-profile computer graphics for internal and external

presentations. Managed IBM Graphics Technical Support Group from January 1990—August 1990.

DATABASE MANAGER

Jun 1987—Aug 1987

Technical Evaluation and Management Systems, Dallas, TX

Configured research database for a pharmaceutical support company. Recorded financial and scientific information of Federal Drug Administration pharmaceutical studies.

Publications

Baker, D., K. Kisselle, A. Anderson, L. Bechtel, A. Chung, L. Hendrix, M. Holcomb, J. Mantel, and M. Wescott (2015): Custom calibration of CS616 Water Content Reflectometer for Loam Soils. *Soil Science Society of America*, in preparation.

Baker D. and T. Ratcliff (2012): *The 50 Most Extreme Places in Our Solar System (Japanese Edition)*. Asakura Publishing, Tokyo, 276pp.

Baker D. and T. Ratcliff (2012): Extreme Earth. In *Indie Shelves Chapbook Winter 2012*, The Last Bookstore Publishing, Los Angeles, 9-12.

Baker D. and T. Ratcliff (2012): Extreme Weather: Nature's Wrath. *Sky and Telescope*, V124, N3, 26-31.

Baker, D. and T. Ratcliff (2011): *Extreme Space*. Thenan Publishing, Seoul, Korea, 367pp.

Baker, D. (2011): Extreme inquiry-based learning: Engaging non-science students with the WOW factor and science portfolios. In *Cosmos in the Classroom: A Hands-on Symposium on Teaching Introductory Astronomy*, ed. A. Fraknoi, Astronomical Society of the Pacific, 294 pp.

Baker, D. (2010): Extreme inquiry-based learning: Engaging non-science students with the WOW factor and science portfolios. *Mercury*, V39, N4, 16.

Baker, D. and T. Ratcliff (2010): *The 50 Most Extreme Places in Our Solar System*. Harvard University Press, Boston, Mass., 304pp.

Baker, D. and T. Ratcliff (2010): *Extreme Orte: Eine Reise zu den 50 Ausgefallensten Plätzen unseres Sonnensystems (Extreme Places: A Trip to the 50 Most Unusual Places in Our Solar System)*. Rowohlt, Reinbek, 288 pp.

Baker, R. D. (2007): Teaching, Learning, and Evaluation. In *Design Guide for Undergraduate Earth System Science Education*, USRA.

Baker, R. D. (2006): Project-based learning, surface energy balance, and establishment of a new undergraduate weather station. *J. Geoscience Edu.*, **54**, 320-328.

- Drake, N. B., L. K. Tamppari, R. D. Baker, B. A. Cantor, and A. S. Hale (2006): Dust devil tracks and wind streaks in the North Polar Region of Mars: A study of the 2007 Phoenix Mars Lander Sites. *Geophys. Res. Letters*, **33**, L19S02, doi: 10.1029/2006GL026270.
- Tao, W.-K., R. Adler, D. Baker, S. Braun, M.-D. Chou, M. F. Jasinski, Y. Jia, R. Kakar, S. Lang, W. Lau, B. Lynn, M. Karyampudi, Z.-X. Pu, M. Shepherd, J. Simpson, D. Starr, Y. Wang, P. Wetzel, and J. Weinman (2003): Regional-scale modeling at NASA Goddard Space Flight Center. *Recent Res. Devel. Atmos. Sci.*, **2**, 1-52.
- Mohr, K. I., R. D. Baker, W.-K. Tao, and J. S. Famiglietti (2003): The sensitivity of West African convective line water budgets to land cover. *J. Hydrometeor.*, **4**, 62-76.
- Tao, W.-K., J. Simpson, D. Baker, S. Braun, M.-D. Chou, B. Ferrier, D. Johnson, A. Khain, S. Lang, B. Lynn, C.-L. Shie, D. Starr, C.-H. Sui, Y. Wang, and P. Wetzel (2003): Microphysics, radiation and surface processes in a non-hydrostatic model. *Meteor. Atmos. Phys.*, **82**, 97-137.
- Baker, R. D., B. H. Lynn, A. Boone, W.-K. Tao, and J. Simpson, (2001): The influence of soil moisture, coastline curvature, and land-breeze circulations on sea-breeze initiated precipitation. *J. Hydrometeor.*, **2**, 193-211.
- Lynn, B. H., D. R. Stauffer, P. J. Wetzel, W.-K. Tao, P. Alpert, N. Perlin, R. D. Baker, R. Munoz, A. Boone, and Y. Jia, (2001): Improved simulation of Florida summer convection using the PLACE land model and a 1.5-order turbulence parameterization coupled to the Penn State-NCAR Mesoscale Model. *Mon. Wea. Rev.*, **129**, 1441-1461.
- Baker, R. D., G. Schubert and P. W. Jones, (2000): Convectively generated internal gravity waves in the lower atmosphere of Venus. Part I: No wind shear. *J. Atmos. Sci.*, **57**, 184-199.
- Baker, R. D., G. Schubert and P. W. Jones, (2000): Convectively generated internal gravity waves in the lower atmosphere of Venus. Part II: Mean wind shear and wave-mean flow interaction. *J. Atmos. Sci.*, **57**, 200-215.
- Baker, R. D., G. Schubert and P. W. Jones, (1999): High Rayleigh number compressible convection in Venus' atmosphere: Penetration, entrainment, and turbulence. *J. Geophys. Res.*, **104**, 3815-3832.
- Baker, R. D. and G. Schubert (1998): Deep convective entrainment by downdrafts in Jupiter's atmosphere. *Icarus*, **136**, 340-343.
- Baker, R. D., G. Schubert and P. W. Jones, (1998): Cloud-level penetrative compressible convection in the Venus atmosphere. *J. Atmos. Sci.*, **55**, 3-18.
- Baker, R. D. and G. Schubert, (1992): Cellular convection in the atmosphere of Venus. *Nature*, **355**, 710-712.

Book Signings and Related Presentations

Duke TIP Program, Austin College, July 16, 2015 and June 18, 2015.
Duke TIP Program, Austin College, July 17, 2014 and June 19, 2014.
Duke TIP Program, Austin College, July 18, 2013 and June 20, 2013.
Cockrill Middle School, McKinney, TX, March 27, 2013.
Duke TIP Program, Austin College, July 18, 2012.
Cockrill Middle School, McKinney, TX, April 18, 2012.
Heard Natural Science Museum and Wildlife Sanctuary, McKinney, TX, November 4, 2011.
Collin College Distinguished Speaker, Plano, TX, November 1, 2011.
West Hollywood Book Fair Science Panel, West Hollywood, CA, October 2, 2011.
East Carolina University, Greenville, NC, September 15, 2011.
Slaughter Elementary School, McKinney, TX, May 17, 2011.
Barnes and Noble Astronomy Day, Plano, Texas, April 30, 2011.
Austin College DC GOLD Alumni Event, Washington DC, April 3, 2011.
Smithsonian National Air and Space Museum, The Mall of Washington DC, April 3, 2011.
Smithsonian Udvar-Hazy Museum, Chantilly, VA, April 2, 2011.
Minshew Elementary School Guest Author, McKinney, TX, March 29, 2011.
Cistercian Preparatory School Book Fair, Irving, TX, March 6, 2011.
A Real Bookstore, Fairview, TX, March 1, 2011.
Lakeside High School, Hot Springs, AR, January 24, 2011.
Books-a-Million, Hot Springs, AR, January 23, 2011.
St. Marks School of Texas, Dallas, TX, January 20, 2011.
Tuesday Junior Literacy Club, Sherman, TX, January 18, 2011.
San Francisco Borders – Union Square, San Francisco, CA, December 14, 2010.
Heard Natural Science Museum and Wildlife Sanctuary, McKinney, TX, November 19, 2010.
Hagerman National Wildlife Refuge, Sherman, TX, November 13, 2010.
Blackland Prairie Master Naturalist Society, McKinney, TX, November 9, 2010.
Austin College Homecoming, Sherman, TX, October 22, 2010.
Flintridge Bookstore and Coffeehouse, La Canada, CA, October 5, 2010.
Austin College Family Weekend, Sherman, TX, September 25, 2010.
Borders Bookstore, Allen, TX, September 17, 2010.
Austin College Tuesday Afternoon Seminar, Sherman, TX, September 7, 2010.
Austin College Board of Trustees Meeting, June 4, 2010.

Media Events

Sherman Herald Democrat: “Austin College to Host Star Party”, October 14, 2015.
KTEN-TV: “Austin College Celebrates Fall”, September 23, 2015.
Southern Collegiate Athletic Conference: “8in8 Tour – Day 4 Austin College”, September 6, 2015.

Sherman Herald Democrat: "AC Students Present Results of Semester-Long Study of Local Weather", May 9 2015.

KTEN-TV: "Texoma's Last Solar Eclipse Until 2017 Has Passed", October 23, 2014.

Sherman Herald Democrat: "AC Rings in Spring the (Really) Old Fashioned Way", March 23, 2014.

StarDate Radio Program: "Spring Equinox", March 20, 2014.

KXII-TV: "Austin College Students Raising Money for Philippines Relief Effort", November 20, 2013.

KTEN-TV: "Austin College Science Class Does More Than Learn About Storms, They Help Others", November 19, 2013.

Sherman Herald Democrat: "Austin College's New Sun Calendar is Spot-On for Fall", September 22, 2013.

Sherman Herald Democrat: "Austin College Prepares to Open Texoma's Most Advanced Observatory", August 25, 2013.

Native Energy Press Release, "Austin College Encourages Students to Offset CO₂ Emission with Native Energy", July 25, 2013.

KTEN-TV: "Dangers of Lightning", May 9, 2013.

KTEN-TV: "AC Professor Weighs In on Asteroid and Meteorite", February 15, 2013.

KTEN-TV: "Local Professor Weighs in on Sandy Being an Extreme Storm", October 31, 2012.

KXII-TV: "2012 on Pace to be Warmest Texoma Winter", March 9, 2012.

KTEN-TV: "Strongest Solar Storm in 5 Years Hits Earth", March 9, 2012.

Discovery Channel: "The Year the Earth Went Wild" Hour Special, December 26, 2011.

KXII-TV: "Expert Explains Oklahoma Quakes", Sherman, TX, November 8, 2011.

KTEN-TV: "Texomans Feel Shake of Record Breaking Earthquake", Sherman, TX, November 6, 2011.

WERS 88.9-FM: "You are Here: Severe Weather", Boston, MA, June 23, 2011.

KXII-TV: "Weird Winter Weather Explained", Sherman, TX, February 13, 2011.

Sentinel Record: "Lakeside Grad Talks About Planets", Hot Springs, AR, January 25, 2011.

Sentinel Record: "Extreme Places", Hot Springs, AR, January 22, 2011.

KZNG 1340-AM: "Talk of the Town with Dick Antoine" radio program, Hot Springs, AR, December 29, 2010.

KERA 90.1-FM: "Think with Krys Boyd" radio program re-broadcast, Dallas, TX, December 23, 2010.

Hot Springs On The Go: "What would we see if we flew through Jupiter's Great Red Spot?", Hot Springs, AR, December 2010.

Dallas Morning News, Allen-McKinney edition: "Borders to host book signing for McKinney professor", September 17, 2010.

KXII-TV: "Extreme Solar System", Sherman, TX, September 7, 2010.

Harvard University Press Blog: "Solar Storms, Auroras, and Your Cell Phone" by David Baker and Todd Ratcliff, September 3, 2010,
(http://harvardpress.typepad.com/hup_publicity/2010/09/index.html)

KERA 90.1-FM: "Think with Krys Boyd" radio program, Dallas, TX, September 1, 2010.

KXII-TV: "Wacky Texoma Weather Not Abnormal", Sherman, TX, April 17, 2009.

WOAI 1200-AM: "Extreme Solar System", San Antonio, TX, October 5, 2008.

Science News: "Satanic Winds: Looking at Dust Devils on Earth and Mars", October 28, 2006.

Discovery Channel: “Forecast Danger” host audition, June 2005.
KXII-TV Morning Show: Interview about planet Mars, Sherman, TX, August 27, 2003.
American Institute of Physics “Discoveries and Breakthroughs Inside Science”: Interview about International H₂O Project, June 2002.
KXII-TV: “Austin College Students Measure the Weather”, Sherman, TX, April 2001.
ABC-NEWS: “Shuttle Radar Tomography Mission”, January 2000.

Invited Presentations

“Wild, Wild Weather of North Texas”, Blackland Prairie Master Naturalist Talk, McKinney, Texas, April 1, 2015.

"Wild Weather and Climate of North Texas", Blackland Prairie Master Naturalist training, Heard Museum, McKinney, Texas, April 9, 2014.

“Extreme Places in Our Solar System”, Perot Museum Science Cast (national broadcast to schools), Dallas, Texas, January 24, 2014.

“Extreme Impacts and the Dinosaurs”, Sherman Museum, Sherman, Texas, July 26, 2013.

“Culture and the Cosmos: Past, Present, and You”, Perot Museum Social Science, Dallas, Texas, June 21, 2013.

"Wild Weather and Climate of North Texas", Bluestem Master Naturalist, Sherman, Texas, May 18, 2013.

"Extreme Impacts: Meteors and Asteroids and Comets, Oh My!", Perot Museum ScienceCast, Dallas, Texas, April 16, 2013.

"Extreme Weather on Earth and Beyond", Friends of Hagerman, Hagerman National Wildlife Refuge, Sherman, Texas, April 13, 2013.

"Wild Weather and Climate of North Texas", Blackland Prairie Master Naturalist training, Heard Museum, McKinney, Texas, April 3, 2013.

“Doomsday 2012”, Sherman Rotary Club, Sherman, Texas, December 12, 2012.

“The Day the Dinosaurs Died”, Sherman Museum, Sherman, Texas, August 3, 2012.

“The Nastiest, Smelliest, Most Extreme Places in Our Solar System”, D. Baker, Duke TIP Event, Austin College, July 18, 2012.

“Rocket Science: Landing on Mars”, Frontiers of Flight Museum, Dallas, Texas, July 17, 2012.

“Wild Weather and Tornadoes in North Texas”, Blackland Prairie Master Naturalist Talk, McKinney, Texas, April 4, 2012.

“Wild, Wild Weather of North Texas”, Blackland Prairie Master Naturalist Talk, McKinney, Texas, April 13, 2011.

“Hot, Cold, Wet, Dry, Calm, Severe: Weather and Climate in North Texas”, Blackland Prairie Master Naturalist Talk, McKinney, Texas, March 31, 2010.

“New Horizons in the Sciences”, Austin College Presidential Inauguration Symposium, November 5, 2009.

“The Most Extreme Places in Our Solar System”, Austin College Alumni College, October 16, 2009.

“Weather and Climate in North Texas”, Blackland Prairie Master Naturalist Talk, Heard Museum, McKinney, Texas, March 18, 2009.

“The Most Extreme Places in Our Solar System”, Austin College Alumni College on the Road Seminar, San Antonio, Texas, October 5, 2008.

“Weather and Climate in North Texas”, Blackland Prairie Master Naturalist Talk, Allen, Texas, April 16, 2008.

“How a Small Liberal Arts College Influenced Earth System Science Education Nationwide – and How My Teaching Improved Because of It”, Center for Liberal Arts Teaching and Scholarship Seminar, Austin College, March 13, 2008.

“Will It Blow? My 6-Day Adventure on Mount St. Helens”, Austin College Environmental Studies Seminar, October 30, 2007.

“The Most Extreme Places in Our Solar System”, Austin College Humanities Seminar, November 7, 2006.

“The Most Extreme Places in Our Solar System”, Austin College Parents’ Weekend Luncheon, September 22, 2006.

“Inquiry-Based Learning with Earth Science Portfolios”, NASA/USRA Earth System Science Education for the 21st Century Annual Meeting, Fairbanks, AK, August 6, 2005.

“Earth System Science Education in a Liberal Arts Environment,” NASA/USRA Earth System Science Education for the 21st Century Annual Meeting, Monterey, CA, June 30, 2004.

“Energy and Water: How Land and Atmosphere Communicate at the Austin College Weather Station,” Austin College Environmental Studies Seminar, October 15, 2003.

“Patagonia JanTerm 2003: Culture, Nature, and High Adventure,” Austin College Humanities Seminar, April 8, 2003.

“Earth, Air, Water, Fire: Essential Elements for Thunderstorm Development?” Trinity University Physics Department Seminar, March 25, 2003.

“Soil Moisture, Energy Balance, and Land/Atmosphere Interaction at the Austin College Weather Station,” Texas A&M University Department of Meteorology Seminar, March 26, 2002.

“Curious Waves in the Clouds of Venus,” Austin College Physics Department Seminar, March 27, 2000.

“Atmospheric Dynamics of Venus: Scales Large and Small,” R. D. Baker, American Geophysical Union Fall Meeting, San Francisco, CA, December 1999.

“Land-Atmosphere Interaction in Florida and in Darwin, Australia: Soil Moisture, Sea Breezes, and Severe Storms,” NASA/UMBC Joint Center for Earth Systems Technology Seminar, November 18, 1999.

“Weather on Venus, Jupiter, and Earth,” Loyola College Department of Physics Seminar, November 12, 1998.

“Atmospheric Convection and Gravity Waves on Venus,” UCLA Department of Atmospheric Sciences Seminar, May 30, 1997.

“Atmospheric Convection on Venus: Penetration, Entrainment, and Gravity Wave Generation,” NASA/GSFC Mesoscale Atmospheric Processes Branch Seminar, February 13, 1997.

“Penetrative Compressible Convection in Venus' Atmosphere,” California Institute of Technology Planetary Science Seminar, December 5, 1995.

Presentations

“Design and Construction of a Solar Observatory in a Liberal Arts Environment: Austin College’s Gnomon and Meridian Line”, D. Baker and D. Salisbury, American Astronomical Society Annual Meeting, Washington DC, January 2014.

“Following the Ways of Great Scientists: Authentic Inquiry with Science Portfolios”, D. Baker, Astronomical Society of the Pacific Annual Meeting, Tucson, AZ, August, 2012.

“Extreme Solar System in the Undergraduate Classroom”, D. Baker, Center for Astronomy Education Texas Regional Teaching Exchange, Collin College, Plano, TX, February 2011.

“Extreme Solar System in the Undergraduate Classroom”, D. Baker, American Geophysical Union Fall Meeting, San Francisco, CA, December 2010.

“Extreme Inquiry-Based Learning: Engaging Non-Science Students with the WOW Factor

and Science Portfolios”, D. Baker, Astronomical Society of the Pacific Cosmos in the Classroom Meeting, Boulder, CO, August, 2010.

“Design Guide for Earth System Science Education: Common Student Learning Objectives and Special Pedagogical Approaches”, R. D. Baker, American Geophysical Union Fall Meeting, San Francisco, CA, December 2006.

“Tested Tools You Can Use: Evaluating Earth System Science Courses”, S. P. Lee, A. Prakash, D. Reider, D. Baker, American Geophysical Union Fall Meeting, San Francisco, CA, December 2006.

“Observed Dust Devil Tracks in the North Polar Region of Mars”, N. Drake, L. K. Tamppari, and D. Baker, American Geophysical Union Fall Meeting, San Francisco, CA, December 2005.

“Observed Dust Devil Tracks in the North Polar Region of Mars”, N. Drake, L. K. Tamppari, and D. Baker, Dust Devils on Earth and Mars Workshop, Flagstaff, AZ, September 19-20, 2005.

“Earth System Science Education at Austin College: Unique Undergraduate Experiences and Enhanced Public Awareness”, D. Baker, M. Fairley, K. Kisselle, P. Schulze, and J. Shahid, NASA/USRA Earth System Science Education for the 21st Century Annual Meeting, Fairbanks, AK, August 2005.

“Undergraduate Earth System Science Education: Project-Based Learning, Land-Atmosphere Interaction, and a Newly Established Student Weather Station”, D. Baker, American Geophysical Union Fall Meeting, San Francisco, CA, December 2004.

“Soil Moisture, Land-Atmosphere Interaction, and the 6-7 May 2000 Missouri Flash Flood Event,” R. D. Baker, Y. Wang, W.-K. Tao, and P. Wetzel, 21st Conference on Severe Local Storms, San Antonio, Texas, August 12-16, 2002.

“Soil Moisture and Mesoscale Convective Complex Development during the 1993 Midwest Flood: Results from the MM5-PLACE Atmosphere/Land-Surface Model,” R. D. Baker, Y. Wang, W.-K. Tao, and P. Wetzel, American Meteorological Society 81st Annual Meeting, Albuquerque, New Mexico, January 14-19, 2001.

“Soil Moisture, Coastline Curvature, and Sea Breeze Initiated Precipitation over Florida,” R. D. Baker, B. H. Lynn, A. Boone, and W.-K. Tao, American Geophysical Union Fall Meeting, San Francisco, CA, December 1999.

“Sensitivity of Florida Precipitation to Soil Moisture and Wind: Results from the GCE-PLACE Atmospheric-Land Surface Model,” R. D. Baker, B. H. Lynn, A. Boone, and W.-K. Tao, NCAR Workshop on Land-Surface Modeling and Applications to Mesoscale Models, Boulder, CO, June 1999.

“The Influence of Soil Moisture and Wind on Rainfall Distribution and Intensity in Florida,” R. D. Baker, B. H. Lynn, A. Boone, and W.-K. Tao, American Geophysical Union Fall Meeting, San Francisco, CA, December 1998.

“Jovian Hotspots and Convective Entrainment,” R. D. Baker, G. Schubert, American Geophysical Union Fall Meeting, San Francisco, CA, December 1997.

“Convective Entrainment and Dry Downdrafts on Jupiter,” R. D. Baker, G. Schubert, Division for the Planetary Sciences of the American Astronomical Society Annual Meeting, Cambridge, MA, July 1997.

“Convectively Generated Internal Gravity Waves in the Lower Atmosphere of Venus,” G. Schubert, R. D. Baker, Division for the Planetary Sciences of the American Astronomical Society Annual Meeting, Cambridge, MA, July 1997.

“Turbulent Atmospheric Convection and Chaotic Generation of Gravity Waves on Venus,” R. D. Baker, G. Schubert, P. W. Jones, American Geophysical Union Fall Meeting, San Francisco, CA, December 1996.

“High Rayleigh Number Compressible Convection in Venus' Atmosphere: Stable Layer Penetration and Entrainment,” R. D. Baker, G. Schubert, P. W. Jones, Division for the Planetary Sciences of the American Astronomical Society Annual Meeting, Tucson, AZ, October 1996.

“Simulations of Nonlinear Penetrative Compressible Convection and Gravity Wave Feedback,” R. D. Baker, G. Schubert, P. W. Jones, American Geophysical Union Fall Meeting, San Francisco, CA, December 1995.

“Cloud-Level Penetrative Compressible Convection in Venus' Atmosphere,” R. D. Baker, G. Schubert, P. W. Jones, Division for the Planetary Sciences of the American Astronomical Society Annual Meeting, Kona, HI, October 1995.

Funded Proposals

Austin College Sabbatical Grant, “Development of Adams Observatory Teaching, Research, and Outreach Programs”, 2014.

Keck Foundation Grant, “Astronomy 101: Exploring the Universe Course Development”, Austin College, 2012.

Austin College Priddy Foundation Summer Research Grant, “Web Site Development for Extreme Solar System Book”, Summer 2009.

Austin College Sabbatical Grant, “The Most Extreme Places in Our Solar System”, 2007.

Principal Investigator, NASA/USRA Earth System Science Education for the 21st Century, “Earth System Science Education in a Liberal Arts Environment: Unique Undergraduate Experiences and Enhanced Public Awareness”, 2004-2007.

Austin College Priddy Foundation Summer Research Grant, “Energy Balance at the Earth’s Surface: Summer Undergraduate Research with the Austin College Weather Station”, Summer 2004.

Austin College Cullen Grant, “Software Upgrade for the Austin College Weather Station”, September 2003.

Austin College Cullen Grant, “Web Site Development for the Austin College Weather Station”, Summer 2003.

Austin College Cullen Grant, “Telecommunications for Austin College Weather Station,” April 2001.

Principal Investigator, NASA Solid Earth and Natural Hazards, “Flood Forecasting Using a Regional Scale Atmosphere/Land-Surface Modeling System.”, 2000-2003.

Co-Investigator, NASA Tropical Rainfall Measuring Mission (TRMM), “Use of Data from TRMM Field Campaigns in Improved Initialization and Validation of High Resolution Models.”, 1998-2000.

Programs & Workshops

Making Every Pixel Count Workshop, Mt. Lemmon Observatory, Tucson, Arizona, May 1-4, 2014.

Science Communication Workshop, American Astronomical Society and National Geographic Society, Washington, DC, January 5, 2014.

Center for Astronomy Education Texas Regional Astronomy Teaching Exchange, Collin College, Plano, TX, February 2011.

The School for Field Studies Environmental Faculty Workshop, Turks and Caicos Islands, January 16-20, 2007.

Geographical Information Systems (GIS) Workshop participant, Austin College, Sherman, Texas, September 17, 2005.

Learner-Centered Introductory Astronomy Teaching, Chautauqua Workshop participant, Biosphere II, Oracle, Arizona, May 17-21, 2003.

National Severe Weather Workshop, participant, Norman, OK, March 1-2, 2002.

Promoting Active Learning in Introductory Physics Courses, Chautauqua Workshop participant, University of Oregon, Eugene, August 3-5, 2001.

NASA Shuttle Radar Topography Mission (SRTM) Science Team member, 1999—present.

Meteorological Instrumentation and Observations Techniques Workshop, Albuquerque, NM, participant, January 14, 2001.

Penn State/NCAR MM5 Users' Workshop, Boulder, CO, participant, June 23-25, 1999.

NASA TRMM/LBA Sounding Workshop, Charlottesville, VA, participant, April 27, 1999.

GEWEX Continental-scale International Project (GCIP) Vision Meeting, Wheaton, MD, participant, April 20-21, 1998.

Summer School on Nonlinear Waves, University of California, Los Angeles, participant, June 24-July 3, 1996.

Parallel Supercomputing Workshop, San Diego Supercomputer Center, participant, January 31-February 1, 1996.

Mantle Convection Workshop, Institute of Geophysics and Planetary Physics, Los Alamos National Laboratory, participant, July 20-31, 1992.

Introduction to Supercomputing Workshop, NASA Ames Research Center, participant, April 3-5, 1991.

Teaching Interests

Undergraduate Courses, Non-major:

The Wild, Wild Weather

The Day After Tomorrow: Global Climate and Extreme Weather

Science and Policy of Natural Disasters

Nature and Culture of Patagonia (International Travel Course)

The Earth: Scientific and Cultural Perspectives in the Pacific (International Travel Course)

Australia: Scientific and Cultural Perspectives of Nature (International Travel Course)

Peru, Ecuador, and the Galapagos: Scientific and Cultural Perspectives of Nature (International Travel Course)

Into Wild Africa: Science and Culture of Nature (International Travel Course to Kenya)

Maya World Expedition (International Travel Course to Guatemala, Belize, Mexico)

Land of Fire and Ice (International Travel Course to Iceland)

The Most Extreme Places in Our Solar System

Planets: Evolution, Climate, and Extraterrestrial Life?

Introductory Physics Labs (Algebra-Based)

Undergraduate Courses, Major:

Workshop Physics (Calculus-Based Introductory Physics)

Vibrations, Waves, and Optics

Modern Physics
Classical Mechanics, Nonlinear Dynamics, and Chaos
Electromagnetism
Fluid Dynamics
Computational Physics
Thermal Physics
Atmospheric and Environmental Physics
Establishment of the Austin College Weather Station
The Most Extreme Places in Our Solar System
Observational Astronomy
Research Experiences in Physics

Research Interests

Planetary Atmospheres
Land-Atmosphere Interaction
Thunderstorm Development
Extreme Precipitation Events and Flash Flooding
Atmospheric Convection and Gravity Waves
Nonlinear Dynamics of the Carbon Cycle
Physics and Science Education Research: Scientific Inquiry Portfolios
Earth System Science Education: Teaching, Learning, and Evaluation

Professional Societies

Astronomical Society of the Pacific, 2010-present.
The Planetary Society, 2007-present.
American Association of Physics Teachers, member, 1999-present.
American Meteorological Society, member, 1997-present.
Division for Planetary Sciences of the American Astronomical Society, member, 1996-present.
American Geophysical Union, member, 1995-present.
Phi Beta Kappa, 1989-present.

Educational Outreach

Blood Moon Lunar Eclipse Party, Adams Observatory, September 2015.
Fall Equinox Event, IDEA Center Solar Observatory, Austin College, September 2015.
Duke TIP Star Parties for 7-8 grade students, June & July 2015.
Bennett Elementary AC Visit, "Extreme Solar System", April 29, 2015.
Spring Equinox Event, IDEA Center Solar Observatory, Austin College, March 2015.
"Become a Weather Scientist", Imagine International Academy of North Texas (2nd grade),
McKinney, Texas, March 2015.
Star Party, Austin College Board of Trustees, Austin College, Sherman, Texas, November
2014.
Solar Eclipse Party, Adams Observatory, October 2014.
Star Party, Austin College Faculty and Staff, Austin College, Sherman, Texas, October
2014.
Fall Equinox Event, IDEA Center Solar Observatory, Austin College, September 2014.
Duke TIP Program, "Extreme Solar System", Austin College, July 17, 2013 and June 19,

2014.

Summer Solstice Event (associated with IDEA Center LEED Certification Event), IDEA Center Solar Observatory, Austin College, June 2014.

Spring Equinox Event, IDEA Center Solar Observatory, Austin College, March 2014

Fall Equinox Event, IDEA Center Solar Observatory, Austin College, September 2013.

Summer Solstice Event, IDEA Center Solar Observatory, Austin College, June 2013.

Star Party, Women in Philanthropy Retreat, Austin College, Sherman, Texas, May 2013.

Star Party, Imagine International Academy of North Texas (2nd grade), McKinney, Texas, April 2013.

"Become a Weather Scientist", Imagine International Academy of North Texas (2nd grade), McKinney, Texas, March 2013.

Transit of Venus Public Viewing, McKinney, Texas, June 2012.

Board Member, Heard Museum Education Advisory Board, McKinney, Texas, June 2010 – present.

Consultant, Heard Museum in McKinney, Texas, GLOBE weather program.

Comet Party, Austin College, November 2007.

Mars Party, Austin College, October 2005.

Earth System Science Education High School Teacher Workshop, June 2005 & 2006.

Earth System and Global Change Science Lecture Series coordinator, February 2005 – present.

Star Party, Austin College, April 2004.

Hands-On Weather Activity, ACT Academy Grades K-1, McKinney, Texas, January 2004.

Mars Night, Austin College, September 2003.

"A Night of Energy" for Sherman Cub Scout Troop, Event Coordinator, November 2000.

NASA/GSFC Summer Institute on Atmospheric and Hydrospheric Sciences, 912 Branch Coordinator, May 1998-August 2000.

Science Fair Judge, Martin Luther King Middle School, January 1998.

Visiting Scientist, Wildwood Elementary School, May 1995-June 1997.

Academic Service

Austin College Physics Faculty Search Committee, Chair, 2015-16.

Austin College Chemistry Search Committee, 2015.

Austin College Education Search Committee, 2014-15.

Austin College Entrepreneurship Pitch "Shark Tank" Competition collaborator, Fall 2014.

Austin College New Faculty Orientation Speaker, August 2014.

Austin College Education Department "Weather" Summer School Speaker, July 2014.

Austin College Chemistry Search Committee, 2014.

Austin College Physics Faculty Search Committee, Chair, 2013-14.

Austin College Faculty Review and Promotion Committee, Fall 2012 – present.

Austin College Physics Faculty Search Committee, Chair, 2010-11.

Heard Natural Science Museum Education Advisory Board, 2010-12.

Austin College Board of Trustees Science Building Presentation, Spring 2009.

Austin College Faculty Marshal, Spring 2009 – present. Lead Marshal 2014 – present.

Austin College Presidents Climate Commitment – Thinking Green Committee, Fall 2008-present.

Austin College Board of Trustees QEP Presentation, Fall 2008.

Austin College Quality Enhancement Plan Committee, Fall 2007-Spring 2009.
Austin College Communication/Inquiry Committee, Fall 2007-present.
Austin College Physics Department Chair, Fall 2005 – present.
Austin College Institutional Effectiveness Committee, Fall 2005 – Spring 2007.
Austin College Faculty Hearing Committee, Fall 2005 – Spring 2006, Fall 2007 – Spring 2008.
Austin College Teagle Project for Study Abroad, Spring 2005 – Spring 2006.
Austin College Earth System and Global Climate Seminar Series Director, 2005.
Austin College Center for Liberal Arts Teaching, Learning and Faculty Development Advisory Committee, January 2005-May 2009.
Austin College Science Division Student Research Symposium Committee, Fall 2004-2005.
Austin College Science Division Instrumentation Technician Search Committee, July 2004.
NASA/USRA Earth System Science Education Working Group, July 2004-July 2007.
Austin College Earth System Science Education Committee, Chair May 2004-May 2010.
Austin College Physics Faculty Search Committee, Spring 2004.
Austin College Physics Faculty Search Committee, Spring 2003.
Austin College Environmental Studies Faculty Search Committee, Spring 2003.
Austin College New Parent Orientation, September 2002.
Austin College Communication/Inquiry Workshop, May 2002.
Austin College Society of Physics Student Faculty Sponsor, September 2001-present.
Austin College Board of Trustees Faculty Presentation, May 2001.
Austin College Math and Science Preview Weekend, February 2001-2008.
Austin College Physics Honors Thesis Supervisor, 2001, 2003, 2004-05, 2006, 2012.
Austin College Science Building Committee, November 2000-September 2013.
Austin College Phi Beta Kappa Chapter Committee, October 2000-present.
 Secretary-Treasurer, January 2005-September 2005, September 2007-2013.
 Members-in-Course subcommittee chair, September 2002-December 2004.
Austin College Environmental Studies Committee, September 2000-present.