

CURRICULUM VITAE

SARAH GIBSON

EDUCATION

Degrees

1995	Ph.D. (Astrophysics), University of Colorado, Boulder, CO
1993	M.S. (Astrophysics), University of Colorado, Boulder, CO
1989	B.S. (Physics), Stanford University, Stanford, CA

Title of Ph.D. Thesis

The Large-Scale Structure of the Solar Minimum Corona

POST-DEGREE APPOINTMENTS

2001-ongoing	Interim HAO Director (2019-); Scientist IV/Section Head (2012-2019); Scientist III/Section Head (2010-2012); Scientist III (2007-2010); Scientist II (2004-2007); Scientist I (2001-2004), High Altitude Observatory, National Center for Atmospheric Research (HAO/NCAR)
2001	Visiting Scientist, High Altitude Observatory, HAO/NCAR
2000-2001	Research Assistant Professor, Physics Department, The Catholic University of America
1999-2000	NSF-NATO Postdoctoral Fellow, Department of Applied Mathematics and Theoretical Physics, University of Cambridge
1998-1999	Research Assistant Professor, Physics Department, The Catholic University of America
1996-1998	National Research Council Associate, NASA Goddard Space Flight Center
1995-1996	Postdoctoral Scientist, HAO/NCAR

SCIENTIFIC AND TECHNICAL ACCOMPLISHMENTS

Scientific Accomplishments

- 2018- Analysis of science from the Sun's poles **2.70**
- 2018- Living Review in Solar Physics on Coronal Prominences: Theory and Models **2.68**
- 2017- Quantification and interpretation of polarimetric signals in saturated vs unsaturated Hanle regimes, through forward models of both visible/IR and UV coronal lines. *Collaboration with NCAR Affiliate Scientist Silvano Fineschi (Turin Observatory) and early-career visiting scientist Jie Zhao (Purple Mountain Observatory), 2.74*
- 2016- First demonstration of the presence of magnetic nulls in a coronal pseudostreamer using linear polarization measurements from the Coronal Multichannel Polarimeter. Discovery of new diagnostic of magnetic expansion at the base of the solar wind. *Lead role in collaboration. 2.64, 2.71, 2.75*
- 2009- Quantification and interpretation of plasma properties and polarimetric signatures of prominence cavities using 3D forward modeling of MHD flux-rope equilibria and multi-wavelength observations. Discovery of nested toroidal line-of-sight flows and “lagomorphic” polarimetric signatures in CoMP telescope data indicating presence of pre-eruption magnetic flux ropes in cavities. Demonstration that teardrop-shaped morphology in coronal cavities and cavity-center height in relation to global magnetic fields are predictors of impending eruption. *Principal role in international collaboration. Leadership of International Space Science Institute (ISSI) working groups on Coronal Prominence Cavities and Coronal Magnetism and mentorship of extended research project of undergraduate student B. Forland. 2.20, 2.38-2.40, 2.45, 2.47-2.49, 2.51, 2.57, 2.59, 2.60, 2.73, 3.14, 3.16, 3.19, 7.36-7.37, 7.39-7.41, 7.43-7.48*
- 2009-2013 Explanation of observed multiwavelength flows connecting prominences and cavities in terms of model of magnetic flux rope with thermodynamically-decoupled subsystems. *Thesis work of HAO Newkirk graduate student D. Schmit; Acted as Schmit's HAO Supervisor and his External Advisor. 2.37, 2.40, 2.53, 2.56, 3.18*
- 2008-2011 Comprehensive, Sun-to-Earth observational description of the recent epochal solar minimum (Whole Heliosphere Interval - WHI), and intercomparison with previous solar minima. Discovery that strong periodicities during the last minimum were unusual on timescales of the geomagnetic record (~150 years), most likely due to a combination of low activity and longitudinal asymmetries (possibly rooted in the solar interior) which resulted in long-lived, well-defined solar-wind structures

- (high-speed streams). Demonstration of proton flux extremes associated with such solar wind structures, and of elevated relativistic electron populations in the Earth's outer-zone radiation belts arising from the periodic forcing. *Lead role in a multidisciplinary, international collaboration.* **2.36, 2.41-2.44, 2.46, 2.52, 2.54, 3.12, 3.15, 6.11-6.13, 7.19-7.22, 7.24, 7.26, 7.28, 7.30-7.35, 7.38, 7.42**
- 2007-2009 First quantitative model determination of prominence-cavity density from white-light observations that explicitly accounts for spurious contributions of non-cavity density along line of sight. Discovery of upper limit on cavity-top height of approximately 0.5 R_{sun} above the solar surface, constraining the stability of pre-CME equilibrium states. *Mentor for REU summer project and Senior Honors Thesis of undergraduate James Fuller.* **2.30, 2.34**
- 2003-2009 Development of theory that explains multiple CMEs as partially-ejected flux ropes from a single coronal source region, and a "tethered spheromak" topology of interplanetary CMEs as a consequence of writhing motions and reconnection during the partial ejection. This model is important to space weather prediction, as it implies significant differences between the helicity and connectivity of ejected ropes and their pre-reconnection source structures. Numerical MHD simulations of these processes match a wide range of multi-wavelength observations at the Sun and in the solar wind. *Long-term collaboration with Yuhong Fan, numerical physicist and NCAR Senior Scientist.* **2.19, 2.21, 2.25, 2.29, 2.55, 2.31-2.32, 6.6, 7.14-7.18, 7.23, 7.25, 7.29**
- 1999-2006 Successful comparison of flux-rope equilibrium models with the observed properties of (non-eruptive) coronal filaments and related phenomena, including the first comprehensive observational study of white-light coronal prominence cavities and their relationship to CMEs. *Lead role in international collaboration.* **2.14, 2.22, 2.24, 2.26-2.28, 6.5, 7.12-7.13**
- 1996-2002 Comprehensive comparison of data and models of the Sun and solar wind at solar minimum, and multi-wavelength observational analysis and description of sigmoid active regions. *Lead role in international collaborations related to Whole Sun Month campaigns and subsequent studies.* **2.7-2.13, 2.15, 2.17-2.18, 3.1-3.3, 6.1,6.4, 7.1-7.2, 7.5-7.7**
- 1996-1998 Discovery of exact, three-dimensional, time-dependent, analytic model of CMEs. *Collaboration with B. C. Low, theoretical physicist and NCAR Senior Scientist.* **2.5, 3.4, 6.2, 7.3-7.4, 7.8-7.11**
- 1990-1998 Demonstration of significance of bulk currents and current sheets to magnetostatic force balance in solar corona, using observations and models. *Ph.D. thesis and subsequent studies.* **1, 2.1-2.2, 2.4, 2.6**

1994-1995 Analysis of nonlinear dynamics of generalized three-wave system relevant to 1D driven Zakharov PDE system. *Graduate Comps II project in collaboration with M. Goldman/D. Newman, plasma physicists and University of Colorado faculty/staff.* **2.3**

Technical Accomplishments

- 2016-ongoing Development of the McIntosh Archive, in particular software and systems for preservation, digitization and analysis of four decades of solar maps made by Patrick McIntosh. *Lead role in collaboration with Boston College* **2.69, 3.25, 3.27**
- 2015-ongoing Development of Data-Optimized Coronal Field Model, a methodology for determining the coronal magnetic field using coronal polarimetric and other observations. *Lead role in international collaboration.* **2.61, 2.62, 2.63, 2.72**
- 2009-ongoing Construction of FORWARD SolarSoft IDL package, a model-data comparison toolset which reproduces a broad range of observables from magnetic and morphological models, and facilitates side-by-side comparison to data (<http://people.hao.ucar.edu/sgibson/FORWARD>). *Overall coordinator of FORWARD project; principle author of approximately two-thirds of its ~150 IDL subroutines.* **2.58, 2.66, 2.67, 3.17, 3.21, 6.15**
- 2007-2008 Development and coordination of the Whole Heliosphere Interval (WHI), an international observing and modeling effort to characterize the 3D interconnected solar-heliospheric-planetary system. Formation of International Astronomical Union working group on Comparative Magnetic Minima. *Co-leader of WHI (with NASA/GSFC scientist Barbara Thompson) and Chair of IAU WG, responsible for web site (<http://ihy.boulder.swri.edu/IAUWG/WEBPAGES/IAUWG.shtml>).*
- 2005-2006 Development and implementation of multi-wavelength observational campaign for the International Heliophysical Year (IHY), on the subject of coronal filament cavities. *Campaign Coordinator and Solar Discipline Scientist for IHY.*
- 1996-1999 Development and coordination of the Whole Sun Month (WSM) campaigns, international observing and modeling efforts to describe the three-dimensional morphology, plasma properties, and magnetic field of the solar corona, and to connect these structurally to *in situ* observations of the solar wind. *Co-leader of WSM (with NOAA/SWPC scientist Douglas Biesecker).*
- 1997-1998 Contribution to Spartan satellite operations at NASA Johnson and Kennedy Space Centers during the November 1997 and November 1998 missions. *Member of Spartan White Light Coronagraph science team.*

1988-1989 Daily observations, data reduction, and maintenance of mechanical and electronic equipment at Stanford's Wilcox Solar Observatory. *Resident Astronomer*.

COMMUNITY SERVICE

Professional Service

2017-ongoing Project Scientist, Polarimeter to Unite the Corona and Heliosphere (PUNCH; NASA SMEX mission)

2017-2020 Co-chair, Committee on Solar and Space Physics, National Academies

2018-2021 International Astronomical Union Division E (Sun and Heliosphere) President

2018-2019 Chair: Solar Physics Editorial Board

2018-2019 Steering Committee member: Towards Integration of Heliophysics Data, Modeling, and Analysis Tools, NSF Earthcube Research Coordination Network

2013-2019 Member: Space Studies Board (National Research Council); Executive Committee member starting May 2016

2017-2018 Member, Astro2020 Consultation Group

2017-2018 Member, DKIST Science Working Group (NSO)

2017-2019 Member, Solar Physics journal Memoirs committee

2013-2018 COSPAR National Committee Member

2016-2020 Member, Space Science Reviews Editorial Board

2015-2019 Member: Hale Prize Committee (American Astronomical Society/Solar Physics Division)

2015-2018 IAU Division E (Sun and Heliosphere) Vice President

2015-2018 Member: Solar Physics Editorial Board

2015- Co-I, "Association of Spacecraft for Polarimetric and Imaging Investigation of the Corona of the Sun (ASPIICS)", PROBA-3", Zhukov PI

2017 Member, SCOSTEP Next Scientific Program Subcommittee

2016-2017	Member, Next Generation Solar Physics Mission Study Team, NASA-JAXA-ESA
2016	Member, ALMA Science Review Panel (Science Assessor: Stellar evolution and the Sun)
2015-2017	SCOSTEP Science Discipline Representative
2015-2016	Member: NSF AGS/GS Portfolio Review Committee
2014-2016	Editor: Frontiers in Astronomy and Space Science Topical Issue on Coronal Magnetometry
2012-2015	Member: IAU Division E (Sun and Heliosphere) Steering Committee; IAU Commission 10 on Solar Activity Committee; IAU Commission 49 on Interplanetary Plasma and Heliosphere Committee (International Astronomical Union)
2015	Representative: International Partner for COST Action on Polarimetry
2013-2014	Member: NRC Committee on Solar and Space Physics (National Research Council)
2013-2014	Member: Science working group for National Space Weather Program Implementation Plan (National Space Weather Program)
2013-2014	Member and Co-Chair Group B: COSPAR/ILWS International Study Group to develop Roadmap for Space Weather (Committee on Space Research/International Living with a Star)
2012-2014	Leader: International Space Science Institute team on Coronal Magnetism (ISSI)
2013	Member: Committee to Review NASA Science Mission Directorate 2014 Science Plan (NRC)
2007-2013	Vice-Chair (2010-2013)/Committee Member (2007-2010): Solar Observatories Council to the Association of Universities for Research in Astronomy (AURA) Board (NSF)
2010-2011	Member: Steering Committee of Heliophysics Decadal Survey (NRC)
2008-2011	Scientific Editor: Astrophysical Journal
2009-2012	Chair: International Astronomical Union Division E (Solar and Heliosphere) Working Group on Comparative Solar Minima
2006-2010	Member: Heliophysics Subcommittee of the NASA Advisory Council (NAC)

2009-2010	Member: Astro2010 Decadal Survey; Radio, millimeter, and submillimeter Program Prioritization Panel (NRC)
2007-2010	2012-2014 Leader: International Space Science Institute team on Prominence Cavities (ISSI)
2009	Editor: Highlights of Astronomy IAU GA JD16 Proceedings
2008-2009	Chair: AURA Solar Decadal Committee
2005-2009	Member: Advanced Technology Solar Telescope (ATST) Science Working Group
2005-2009	Member: Center for Integrated Space Weather Modeling (CISM) Diversity Committee
2006-2009	Co-secretary: Boulder Solar Alliance, Boulder, CO
2006-2008	Campaign Coordinator & Solar Discipline Scientist International Heliophysical Year
2002-2005	Member: Committee on Solar and Space Physics (NRC)
2002-2004	Member: American Astronomical Society / Solar Physics Division Committee
2000-2001	Guest Editor: Advances in Space Research, COSPAR 2000
1999-present	Session chair at American Geophysical Union, American Astronomical Society, International Astronomical Union, and other meetings
1996-present	Co-chair: Scientific Organizing Committee: International Astronomical Union Division Symposium “Living around Active Stars”, Maresias, Brazil, 2016; Co-chair: Scientific Organizing Committee: International Astronomical Union Division Symposium on Comparative Magnetic Minima, Mendoza, Argentina, 2011 Convener/Main Scientific Organizer: 2019 IUGG session on magnetic flux ropes; 2018 COSPAR session E2.3 “Solar magnetism: Data-driven modeling and requirements on future instrumentation; 2017 IAGA session “Data-driven modeling of the Sun, heliosphere, and space weather”; 2016 COSPAR session E2.3 “Solar magnetism: Data-driven modeling and requirements on future instrumentation; 2014 Fall AGU Meeting session on “Coronal Magnetism”; 2014 COSPAR session E2.1 “Coronal Magnetism”; 2013 Fall AGU Meeting session on “Space Weather”, San Francisco, CA; 2013 ATST Coronal Science workshop, Boulder, CO; 2013 FORWARD modeling workshop, Boulder, CO; 2013 AGU Meeting of the Americas session on slow solar wind sources, Cancun, Mexico; 2012 SHINE working group leader, 2011 AGU Fall

meeting SH21 “The Sun and Heliosphere at the Start of Sunspot Cycle 24”, 2010 AGU Fall meeting SH54A “Coronal Prominence Cavities”; SH21C “Coordinated Results from Solar Dynamics Observatory”; 2010 AGU Meeting of the Americas SH05: “Searching for a Minimum 'Ground State' for the Sun”; 2009 WHI Second Workshop; 2009 IAU General Symposium JD16: “Whole Heliosphere Interval”; 2008 WHI Data and Modeling Assessment Workshop; 2008 AGU Special Session “Whole Heliosphere Interval”; 2000 Whole Sun Month Third Campaign Workshop; Whole Sun Month Special Sessions- 2000 AGU SH04, 1998 SH42A, 1997 SH31A; 1997 First and Second Whole Sun Month Workshops

Scientific Organizing Committees: 2019 IUGG joint IAGA-IAMAS-IAPSO session on space weather; 2018 IAU GA session “Global Coordination of International Astrophysics and Heliophysics activity from the ground and space”; 2018 SHINE session “How does the solar atmosphere connect to the inner heliosphere?”; 2018 COSPAR “Space Climate”; 2018 DKIST Coronal Science workshop; 2018 TESS “Next-generation Solar Physics”; 2018 TESS “Solar wind super session”; 2018 IAU Symposium “Long-term datasets for the understanding of solar and stellar magnetic cycles”; 2016 IAU Symposium “Living around Active Stars, Maresias, Brazil; 2016 Space Climate Symposium, Finland; 2015 IAU General Assembly Focus Meeting on Global Coordination in Heliophysics and Astrophysics; 2014 "Coupling and Dynamics of the Solar Atmosphere", Pune, India; 2013 Space Climate Symposium, Finland; 2011 IAU Symposium 286, Argentina; 2011 First SDO Workshop, California; 2008 IAU symposium Greece; 2007 SOHO-20, Ghent Belgium; 2007 Indo-American Frontiers of Science Symposium, Irvine, CA; 2006 Boulder Solar Day, Boulder, CO; 2005 NCAR/HAO Space Weather Summer School, Boulder, CO; 2005 Solar Chromospheric and Coronal Physics, Lindau, Germany; 2004 National Solar Observatory (NSO) Large-scale Structures, Sunspot, NM; 2004 American Astronomical Society/Solar Physics Division meeting, Denver, CO; 2004 International Heliophysical Year planning workshop, Sunspot, NM; 1998 Solar Wind 9, Nantucket, MA.

Local Organizing Committee, Solar Physics Division meeting June 2009, Boulder, CO.

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| 1996-present | Referee for Space Weather, Advances in Space Research, Astronomy and Astrophysics, Astrophysical Journal, Astrophysical Journal Letters, JASR, Journal of Geophysical Research—Space Physics, Science, Solar Physics, Space Science Series of ISSI (46 between 2001 and May 2019). |
| 1995-present | Proposal reviewer for NASA, NSF, National Academies, NCAR, FWO Belgium, Czech Science Foundation, DOD (58 mail-in and 29 at panels in Washington D. C. between 2001 and 2018); ALMA reviewer (84 proposals 2016) |

1995-present	Letters of reference for students and colleagues - multiple (as many as 40 per year in recent years)
2001-present	Hosted numerous visitors to HAO, including L. Ofman (NASA/GSFC); M. Vieytes (INAF); N. Mathews (CU); B. Thompson (NASA/GSFC); D. Webb (Boston College); R. Susino (Torino); N. Arge (AFRL), C. Bethge (Kiel), E. Deluca (Harvard), J. Dove (MSCD), Y. Elsworth (Univ. Birmingham (UK)), S. Fineschi (Torino), L. Fletcher (Glasgow), J. Fuller (Whitman College), J. Girella (Torino), R. Jain (Sheffield), J. Karpen (NASA/GSFC), T. Kucera (NASA/GSFC), N. Karna (George Mason University), C. Lopez-Portela (UNAM), G. MacDonald (NMSU), C. Mandrini (IAFE), B. Poduval (SWRI), L. Rachmeler (ROB), K. Reeves (Harvard), A. Savcheva (Boston College), A. Sterling (NASA MSFC), T. Toeroek (Cambridge), B. Schmieder (U. Paris), D. Tripathi (Cambridge), S. White (AFRL), J. Zhang (GMU), M. Zhang (U. Beijing), F. Zuccarello (Belgium)

Management Activities

2017-2019	Supervisor, Visiting Scientist Jie Zhao
2017-ongoing	Supervisor, Postdoctoral Associate Anna Malanushenko
2016-ongoing	Supervisor, Scientist IV – Matthias Rempel, Roberto Casini
2015-ongoing	Chair (2016)/Vice chair HAO Director’s Strategic Advisory Committee
2016-ongoing	HAO Working Group “Bz Challenge” leader
2014-2017	Supervisor, Postdoctoral Associate Kevin Dalmasse
2012-ongoing	HAO Appointments Committee
2011-ongoing	HAO Long-term Solar Variability (now Solar Frontiers) Section Head
2003-ongoing	Supervisor, Project Scientist Dr. G. De Toma
2016-2017	Supervisor, CU graduate student Nathaniel Mathews
2010-2015	HAO Scientific Advisory Committee
2011-2015	Supervisor, Scientist III - Mausumi Dikpati, Matthias Rempel
2014-2015	NCAR Senior Scientist Council (NSSC) coordinating committee
2011-2014	Supervisor: Senior Scientist – Phil Judge
2009-2010	NSF Facilities Assessment Editorial Board, Solar Measurements representative

2013	Member, NCAR Strategic Planning Council
2011-ongoing	Supervisor, Senior Scientist Keith MacGregor
2010-2011	HAO Coronal and Heliosphere Deputy Section Head
2010-2012	Supervisor, Postdoctoral Associate Liang Zhao
2009-2011	Supervisor, Postdoctoral Associate Laurel Rachmeler
2009	HAO Director Search Committee
2009	Workforce Management Plan Subcommittee 3
2005-2008	Visitors Committee, High Altitude Observatory
2001-2003	Colloquium co-chair, High Altitude Observatory

Educational/Public Outreach Activities

2009-2018	Graduate Faculty Appointment University of Colorado – Lecturer, to enable participation in thesis committees, etc. (see details below)
2016-	Co-supervised graduate research Nathaniel Mathews
2017	Panel discussion on Women in Science during “Bright Girls, Brilliant Journeys: Girls in Science & Design” workshop – Mackintosh Academy, Littleton CO (Feb 2017)
2017	Fact checking for NOVA eclipse documentary
2015-2016	Online discussions with Georgia Tech Introduction to Astronomy class (Feb 2015; Sep 2015; Feb 2016)
2015	NBC Learn: “When Nature Strikes” (Space Weather episode)
2015	Blog on Huffington Post “Living with Space Weather (Baby, It’s Charged Outside)
2013-2014	Prepared UCAR Capability Briefings: 2014 - “Coronal Magnetism”; 2013 - “Analyzing Space Climate and its Impact on Society” (http://president.ucar.edu/development/capability/space-climate-initiative)
2008-2014	Interacted with press: Presenter on Space Weather, NCAR Journalism program (2014); CU LASP Solar Media Workshop (2009); NCAR Science and the Press presentations (2008, 2009)

- 2000-2014 Participated in Solar Week for Girls: answering on-line “Ask the Scientist” questions.
- 2013 Lectured for "Solar & Stellar Magnetism" class at University of Colorado, involving distance participation from New Jersey Institute of Technology, University of Hawaii, and New Mexico State University (three lectures on storage and release of magnetic energy in the solar corona).
- 2012-2013 Reviewed NOVA education modules ("Anatomy of the Sun"; "Secrets of the Sun"); Provided input to Discovery channel documentary “Sun Storm”, winner of CINE Golden Eagle in Science & Technology.
- 2012-2016 Judged science fair, Summit Middle School, Boulder. Judged student posters, AGU, San Francisco.
- 2007-2012 Supervised graduate student research, D. Schmit, University of Colorado, Boulder, CO; COMP II committee (2009-2010); Thesis committee -- external supervisor
- 2012 Featured in NCAR AtmosNews story: <https://www2.ucar.edu/atmosnews/research/8084/extracting-clues-solar-cavities>; NCAR Annual Report highlight: <http://nar.ucar.edu/2012/lar/page/Improved-Solar-Corona-Views>.
- 2005-2011 Gave presentations for Space Weather Summer School, Boulder (2011); “I have a dream” Foundation “meet the scientist” at Fisk Observatory, University of Colorado, Boulder (2011); Ouray High School physics class (2009); NCAR Undergraduate Leadership Conference (2005).
- 2005-2017 SOARS mentor Marcel Corchado-Albelo (2017); Mentored REU undergraduate summer students research: Co-mentor for Kenzie Nimmo, University of Glasgow (2017); Co-mentor for Luke Burnett, St. Olaf’s College (2015); Co-mentor for B. Forland, Metro State Denver College (2011); Mentor for D. Rastawicki, Franklin and Marshall College, Pennsylvania (2009); Mentor for J. Fuller, Whitman College, Walla-Walla, Washington (2007-2008); Also helped supervise CISM undergraduate research of D. Schmit, Boston University (2005-2006).
- 2011 Appeared in NOVA/National Geographic documentary on the Sun and space weather.
- 2010 Gave NCAR 50th anniversary public lecture at Boulder Public Library.
- 1999-2009 Participated in press releases: Whole Heliosphere Interval (2009); Coronal Cavities and Karen Harvey Prize (2005); NCAR press releases on Space Weather (2002); panel member for NASA Space Science Update on soft-Xray sigmoids (1999).

- 2008-2009 Served on thesis committee Laurel Rachmeler, University of Colorado, Boulder.
- 2004-2009 Presented hands-on scientific labs: “Exploring Magnetism” (2009); “Spinning Stars” (2008); “Looking at the Sun with X-ray Eyes” (2006); “The Sun: 3D and Twisted?” (2004). Expanding Your Horizons, American Association of University Women, Boulder, CO.
- 2008 Acted as one of two guest scientists at CISM graduate student retreat, Breckenridge CO.
- 2005 Assisted with solar education component of NASA grant, Dr. G. Lu, P.I.
- 2003 Participated in COMET-HAO space weather project development.
- 2002-2004 Supervised graduate research on white light coronal cavities, D. Foster, University of Colorado, Boulder.
- 1997 Presented guest lectures to physics classes Einstein High School, Silver Springs, MD; 7th grade class Montessori School, Mount Dora, FL.
- 1996-1998 Mentored Girl Scouts: demonstrated work enabling them to earn merit badges.
- 1989 Taught Freshman Astronomy Lab at University of Colorado, Boulder, including writing and presenting two lectures per week, supervising students’ lab work, and grading their final results.
- 1986-1989 Tutored math and science to 2-3 students, on average 3 hours per week, for the DeGooyer tutoring agency while at Stanford.

Professional Affiliations

American Geophysical Union

American Astronomical Society

International Astronomical Union

Committee on Space Research

FELLOWSHIPS AND ASSOCIATESHIPS

- 2016-2020 Associate: Istituto Nazionale di Astrofisica (INAF) Italy

HONORS AND AWARDS

2016	UCAR 15-year Anniversary Award
2013	UCAR Education & Outreach Award
2007; 2005	Invited participation in National Academy of Sciences Kavli 2 nd and 3 rd Indo-American Frontiers of Science Symposia (“Attendees for the Frontiers of Science symposia are selected from a pool of young researchers (under 45) who have made significant contributions to science”).
2005	2005 Karen Harvey Prize, Solar Physics Division of the American Astronomical Society
1999-2000	Postdoctoral Fellowship, NSF-NATO
1996-1998	Postdoctoral Associateship, National Research Council
1992-1995	Studentship, NASA Graduate Student Research Program
1991	Graduate School Dean’s Small Grant Award, University of Colorado, Boulder
1989-1991	University Fellowship, University of Colorado, Boulder
1990	Studentship Award, Solar Physics Division of the American Astronomical Society
1989	Departmental Honors in Physics, Stanford University
1985	National Merit Scholarship
1985	Bay Area Engineers Week Prize Scholarship

RESEARCH GRANTS AWARDED

2018	Co-Investigator: Accelerating Earth System and Geospace Research with Neural Network-based Auto-encoders, NCAR reinvestment funds
2017-2020	Collaborator, Digitization and Analysis of the McIntosh Map Archive for Studies of Long-term Solar Variability, NSF, Webb PI
2017-2021	Principal Investigator: Data-optimized modeling of ICMEs with internal magnetic structure, NASA LWS
2017-2019	Co-Investigator (Project Scientist): Polarimeter to Unify the Corona and Heliosphere, NASA SMEX, Deforest PI

2017-2020 Co-Investigator: Characterizing the nature of pseudostreamers: Morphology, plasma properties, and magnetic structure, NASA HSR, Miralles PI

2016-2019 Co-Investigator: Determining the magnetic skeleton of the solar corona, NASA HSR, Malanushenko PI

2014-2019 Principal Investigator: Towards improving space weather prediction through the observation and modeling of coronal magnetism, AFOSR

2014-2018 Collaborator: Simultaneous measurements of coronal magnetic and plasma properties with Upgraded CoMP (UCOMP), NSF, Landi

2014-2017 Collaborator: “Waves and magnetism in the solar atmosphere”, NASA, Hindman

2015-2016 Collaborator: 47 years of magnetism, NSF RAPID, Webb (Boston College) PI

2011-2013 Principal Investigator: “Coronal Magnetometry: Building Tools for Discovery”, ISSI International Team in Space Science

2010 Co-Investigator, “Coronal Cavities and Hot Cavity Cores”, NASA GSFC, Kucera

2009-2010 Co-Investigator, “Extended Participation in Advanced Technology Solar Telescope (ATST) Design and Development”, NSF, Knoelker

2008-2010 Co-Investigator, “Spectral Imaging of the Coronal Environment (SPICE)”, NASA SMEX MOO, Hassler

2009-2013 Co-Investigator, “The CME-dimming Connection: How a More Complete Understanding of CME Energetics and Magnetic Connectivity can be Achieved through Dimming Observations”, Reinard

2008-2011 Principal Investigator, “Astrophysical Journal Editorship”, American Astronomical Society

2008-2011 Collaborator, “On the initiation and dynamic evolution of coronal mass ejections”, NASA, de Toma

2008-2011 Collaborator, “Coronal morphology: the interplay of structure and dynamics”, NASA, Macintosh

2008-2010 Principal Investigator: “Coronal Prominence Cavities: A proposal for an ISSI International Team in Space Science”, ISSI

2006-2008 Co-Investigator, “Linking the Sun to the Earth with a New Heliospheric Model”, NCAR Opportunities Fund, M. Miesch

2002-2005	Principal Investigator, “The Emergence of Twisted Magnetic Flux into Pre-existing Coronal Structures”, Air Force Office of Scientific Research
2002-2008	Co-investigator, Center for Integrated Space Weather Modeling
2002	NCAR Principal Investigator, “Interpretive Tools for Analysis of Coronal Images”, NASA Guest Investigation, sub-contract from the Catholic University of America, O. C. St. Cyr
2002-2003	Co-Investigator, “Solar Synoptic Maps Database for the Mauna Loa Solar Observatory”, NCAR Opportunities Fund, G. de Toma
2000-2003	Co-Investigator, “Coronal Magnetic Structures Capable of Producing Coronal Mass Ejections”, NASA Living With a Star, B. C. Low
2001-2004	Co-Investigator, “Interpretation of SOHO/LASCO, EIT, UVCS Observations Using a Multi-dimensional MHD Model”, NASA Guest Investigation, E. Sittler
1998-2000	Principal Investigator, “Modeling the Large-Scale Corona Using Spartan 201-05 Data”, NASA Goddard Space Flight Center

PUBLICATIONS

1. Thesis

Title:	<i>The Large-Scale Structure of the Solar Minimum Corona</i>
Date:	August 1995
Institution:	University of Colorado, Boulder
Advisor:	Fran Bagenal

2. Publications in Refereed Journals

- 2.1. *Bagenal, F., and S. Gibson. Modeling the large-scale structure of the solar corona. *Journ. of Geophys. Res.*, **96**, 17663, 1991.
- 2.2. *Gibson, S. E., and F. Bagenal. Large-scale magnetic field and density distribution in the solar minimum corona. *Journ. of Geophys. Res.*, **100**, A10, 19865, 1995.
- 2.3. Gibson, S., D. Newman, and M. Goldman. Langmuir turbulence and three-wave nonlinear dynamics. *Phys. Rev. E.*, **52**, 558, 1995.
- 2.4. *Gibson, S. E., F. Bagenal, and B. C. Low. Current sheets in the solar minimum corona. *Journ. of Geophys. Res.*, **101**, 4813, 1996.

- 2.5. Gibson, S. E., and B. C. Low. A time-dependent three-dimensional magnetohydrodynamic model of the coronal mass ejection. *Astrophys. Journ.*, **493**, 460, 1998.
- 2.6. Gibson, S. E., and P. Charbonneau. Empirical modeling of the solar corona using genetic algorithms. *Journ. of Geophys. Res.*, **103**, 14511, 1998.
- 2.7. Gibson, S. E., D. Biesecker, M. Guhathakurta, J. T. Hoeksema, A. J. Lazarus, J. Linker, Z. Mikic, Y. Pisanko, P. Riley, J. Steinberg, L. Strachan, A. Szabo, and B. J. Thompson. The three-dimensional coronal magnetic field during Whole Sun Month. *Astrophys. Journ.*, **520**, 871, 1999.
- 2.8. Gibson, S. E., A. Fludra, F. Bagenal, D. Biesecker, G. Del Zanna, and B. Bromage. Solar minimum streamer densities and temperatures using Whole Sun Month coordinated data-sets. *Journ. of Geophys. Res.*, **104**, A5, 9691, 1999.
- 2.9. Biesecker, D. A., B. J. Thompson, S. E. Gibson, D. Alexander, A. Fludra, N. Gopalswamy, J. T. Hoeksema, A. Lecinski, and L. Strachan. The synoptic sun during the first Whole Sun Month campaign: Aug 10-Sep 8, 1996. *Journ. of Geophys. Res.*, **104**, A5, 9679, 1999.
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4. Papers Submitted to Refereed Journals / Papers in Preparation

- 4.1. de Toma, G., Gibson, S., Forland, B., and Fan, Y., Role of the large-scale coronal magnetic field in stabilizing prominence/cavity systems, in preparation

5. Internally Refereed Publications

6. Non-Refereed Publications

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7. Selected First-author Presentations

- 7.1 “Results from the ‘Whole Sun Month’ campaign”, Solar Physics Division of the American Astronomical Society Meeting, Bozeman, MT, 1997 (invited)
- 7.2 “Results from the ‘Whole Sun Month’ campaign”, ESLAB symposium, Noordwijk, Netherlands, 1997 (invited)
- 7.3 “Coronal Mass Ejections: Observations and Modeling”, Royal Astronomical Society Parallel Discussion Meeting, London, United Kingdom, 1999 (invited)
- 7.4 “Storms from the Sun”, Royal Astronomical Society National Astronomy Meeting, Guernsey, United Kingdom, 1999 (invited)
- 7.5 “Global solar wind structure from solar minimum to solar maximum: sources and evolution”, ESLAB symposium, Noordwijk, Netherlands, 2000 (invited)
- 7.6 “Evolution and eruptions of twisted coronal structures”, RISE meeting, Longmont, CO, 2001 (invited)
- 7.7 “Evolution and eruptions of twisted coronal structures”, GOES-R workshop meeting, Boulder, CO, 2001 (invited)
- 7.8 “3-D and twisted: MHD modeling of coronal mass ejections”, Insitute for Theoretical Physics Black Holes conference, Santa Barbara, CA, 2002 (invited)
- 7.9 “3-D and twisted: emergence and eruption of magnetic flux on the Sun”, Space Studies Board Committee on Solar and Space Physics meeting, Irvine, CA, 2004 (invited)
- 7.10 “Twist and flare: the role of helical magnetic structures in the solar corona”, American Astronomical Society meeting, Denver, CO, 2004 (invited)
- 7.11 “Twist and flare: the role of helical magnetic structures in the solar corona”, Asia-Oceania Geophysical Society, Singapore, 2004 (invited)
- 7.12 “The evolving sigmoid: evidence for magnetic flux ropes in the corona before, during, and after a CME”, International Space Science Institute on Solar Dynamics and its Effects on the Heliosphere and Earth, Bern, Switzerland, 2005 (invited)

- 7.13 “The calm before the storm: The link between quiescent cavities and CMEs”, Karen Harvey Prize Lecture, American Geophysical Union Spring meeting, New Orleans, LA, 2005 (invited)
- 7.14 “Twisted magnetic flux ropes: A breeding ground for CMEs?”, American Physical Society Division of Plasma Physics, Denver, CO, 2005 (invited)
- 7.15 “Twisted magnetic flux ropes: A breeding ground for CMEs and space weather?”, International Astronomical Union Symposium 233, Cairo, Egypt, 2006 (invited)
- 7.16 “The emergence and evolution of twisted magnetic fields: comparing models to observations”, Committee on Space Research 36th Scientific Assembly, Beijing, China, 2006 (invited)
- 7.17 “Filaments as flux ropes: the evidence before, during, and after eruption”, Solar, Heliospheric and Interplanetary Environment workshop, Midway, Utah, 2006 (invited)
- 7.18 “The emergence and evolution of twisted magnetic fields: comparing models and observations”, Don Mickey Workshop, Maui, HI, 2006 (invited)
- 7.19 “Science planning of coordinated observing campaigns: lessons for the SDO era”, Solar Dynamics Observatory Workshop, Napa, CA, 2008 (invited)
- 7.20 “Whole Heliosphere Interval: Origins and characteristics of the “quiet” solar wind”, COSPAR, Montreal, Quebec, Canada, 2008 (invited)
- 7.21 “Whole Heliosphere Interval: Early science results”, COSPAR, Montreal, Quebec, Canada, 2008 (invited)
- 7.22 “Whole Heliosphere Interval”, Hinode Second Workshop, Boulder, CO, 2008 (invited)
- 7.23 “Forming tori: Implications and possible origins of a “tethered spheromak” topology in solar eruptions”, Flux Emergence Workshop, Kyoto, Japan, 2008 (invited)
- 7.24 “Whole Heliosphere Interval: Characterizing and connecting the solar minimum heliosphere”, IGY50 meeting, Tokyo, Japan, 2008 (invited)
- 7.25 “Splitting flux ropes: modeling the eruption of magnetic structures on the Sun”, NMSU Astronomy colloquium, 2009 (invited)
- 7.26 “If the Sun is so quiet, why is the Earth ringing? A comparison of two solar minimum intervals”, HPS meeting, Washington DC, 2009 (invited)
- 7.27 “Living *in* a star”, CU LASP Solar Media Workshop, Boulder, 2009 (invited)
- 7.28 “If the Sun is so quiet, why is the Earth still ringing?” CU LASP Solar Media Workshop, Boulder, 2009 (invited)

- 7.29 “Splitting flux ropes and forming tori: modeling the eruption of magnetic structures on the Sun”, CU APS colloquium, Boulder, 2009 (invited)
- 7.30 “End-to-end observations and modeling of Whole Heliosphere Interval: Origins and impacts of fast solar wind streams”, CISM Seminar, 2009 (invited).
- 7.31 “A multifaceted minimum”, Space Weather Week, Boulder, 2010 (invited)
- 7.32 “A multifaceted minimum”, NRL colloquium, Washington DC, 2010 (invited)
- 7.33 “A multifaceted minimum”, Society of Physics Students Undergraduate Colloquium, Cincinnati, Ohio, 2010 (invited)
- 7.34 “WHI in the context of a long and structured solar minimum: An overview of Sun-to-Earth observations”, Space Climate Symposium, Goa, India, 2011 (invited)
- 7.35 “WHI in the context of a long and structured solar minimum: An overview of Sun-to-Earth observations”, IUGG, Melbourne, Australia, 2011 (invited)
- 7.36 "Coronal prominence cavities: Getting to know the invisible man", PROM meeting, Pasadena, California, 2011 (invited)
- 7.37 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", University of Minnesota Physics Colloquium, St. Paul, Minnesota, 2012 (invited)
- 7.38 "Evolution to a Porcupine Sun: Implications for the Solar Wind and Earth", University of Minnesota Space Physics Group Seminar, St. Paul, Minnesota, 2012 (invited)
- 7.39 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", HAO Colloquium, Boulder, Colorado, 2012 (invited)
- 7.40 "Magnetic structure of coronal cavities", Coronal Magnetism Workshop, Boulder, Colorado, 2012 (invited)
- 7.41 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", IUCCA Colloquium, Pune, India, 2012 (invited)
- 7.42 "Space Climate and the Recent Unusual Solar Minimum", COSPAR, Mysore, India, 2012 (invited)
- 7.43 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", ICMS Workshop on Tangled Magnetic Fields, Edinburgh, Scotland, 2012 (invited)
- 7.44 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", NASA Goddard Space Flight Center Colloquium, Greenbelt, MD, 2013 (invited)

- 7.45 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", Dartmouth College Department of Physics and Astronomy, Hanover, NH, 2013 (invited)
- 7.46 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", University of Maryland Physics Colloquium, College Park, MD, 2013 (invited)
- 7.47 "Magnetism and the Invisible Man: the Mysteries of Coronal Cavities", IAU Symposium 300, Paris, France, 2013 (invited)
- 7.48 "Lagomorphs, Lollypops, and Liftoff: Magnetic Flux Rope Signatures of Coronal Cavities", UCLA Flux Rope Workshop, Los Angeles, California, 2014 (invited)
- 7.49 "Prominence Cavities", Coupling and Dynamics in the Sun's Atmosphere, Pune, India, 2014 (invited)
- 7.50 "Coronal Magnetometry Using Multiwavelength Polarimetry", NOAA/SWPC Colloquium, Boulder, Colorado, 2015 (invited)
- 7.51 "Magnetism Matters", Harvard Center for Astrophysics Colloquium, Cambridge, Massachusetts, 2015 (invited)
- 7.52 "Magnetism Matters", Turin Observatory Colloquium, Italy, 2015 (invited)
- 7.53 "Long-term solar variability and solar magnetism" LASP-REU lecture, Boulder, Colorado, 2015 (invited)
- 7.54 "Coronal Magnetometry Using Multiwavelength Polarimetry", IUGG, Prague, Czech Republic, 2015 (invited)
- 7.55 "Introducing the seasons of the Sun-planetary system connections", Heliophysics Summer School, Boulder, Colorado, 2015 (invited lecture)
- 7.56 "Sun-Earth Connections: Magnetism across Time and Space", HAO 75th anniversary, Boulder, 2015 (invited talk)
- 7.57 "The Science of COSMO", HAO 75th anniversary, Boulder, 2015 (invited talk)
- 7.58 "The Science of Space Weather and its Impacts on Society", SSB meeting, Washington DC, 2015 (invited presentation)
- 7.59 "Sun-Earth Connections: Magnetism across Time and Space", LASP colloquium, Boulder, CO, 2016 (invited colloquium)
- 7.60 "DRIVE and Space Weather", SWPC Colloquium, Boulder, CO, 2016 (invited colloquium)

- 7.61 “Interpretation of Coronal Spectropolarimetric Measurements”, Quo Vadis meeting, Boulder, CO, 2016 (invited talk)
- 7.62 “Coronal Holes and the Origins of the Fast Solar Wind”, ISSI Space Weather workshop, Bern, Switzerland, 2016 (invited talk)
- 7.63 “Magnetism across time and space”, Ball Aerospace colloquium, Boulder, CO, September 2016 (invited talk)
- 7.64 “CMEs and their Geospace Impact”, SCOSTEP VARSITI Town Hall meeting, AGU Fall meeting, December 2016 (invited panel member)
- 7.65 “Dynamics and diagnostics of the solar corona: unchained magnetism”, SolarNet 4 meeting, Lanzarote, Spain, February 2017 (invited talk)
- 7.66 “Dynamics and diagnostics of the solar corona: unchained magnetism”, National Solar Observatory Solar Focus talk, Boulder May 2017 (invited seminar)
- 7.67 “Space Weather and Geospace/Heliophysics Community Strategic Planning”, Washington DC, Space Weather Enterprise Forum, June 2017 (invited talk)
- 7.68 “Coronal Magnetometry”, Capetown South Africa, IAGA-IAMAS-IAPSO joint meeting, August 2017 (invited “Reporter Review” talk)
- 7.69 “Space weather prediction through the observation and modeling of coronal magnetism,” Into the Red Dragon’s Lair, Cardiff, Wales, December 2017 (invited talk)
- 7.70 “Space Weather and Space Climate”, Chautauqua Whole Space Series, February 2018 (invited public talk)
- 7.71 “FORWARD”, DKIST Coronal Science Workshop, June 2018 (invited plenary talk)
- 7.72 “Beyond Flatland: Science from high latitudes”, Solar Dynamics Observatory meeting, October 2018 (invited talk)
- 7.73 “Mysteries of the Young Solar Wind”, AGU Fall meeting, December 2018 (invited talk)
- 7.74 “Coronal Magnetism: Spectropolarimetric Diagnostics from UV to IR”, AGU Fall meeting, December 2018 (invited talk)
- 7.75 “Beyond Flatland: A Star of Many Dimensions”, University of Colorado APS Colloquium, April 2019 (invited colloquium)
- 7.76 “Beyond Flatland: A Star of Many Dimensions”, Turin Observatory Colloquium, May 2019 (invited colloquium)

