

# 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	Scientist IV/Section Head (2012-); 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

- 2009-2016            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, 2.60, 3.14, 3.16, 3.19, 4.1, 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<sub>sun</sub> 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

- 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.* **2.59, 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

- 2016-2020 Member, Space Science Reviews Editorial Board
- 2016-2019 Member, ALMA Science Review Panel (Science Assessor: Stellar evolution and the Sun)
- 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
- 2015-2017 COSPAR National Committee Member
- 2013-2017 Member: Space Studies Board (National Research Council)
- 2015- SCOSTEP Science Discipline Representative

2015- Science Working group, “Association of Spacecraft for Polarimetric and Imaging Investigation of the Corona of the Sun (ASPIICS)”, PROBA-3”, Zhukov

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)

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)

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: 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: 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.

- 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 (43 between 2001 and May 2016).
- 1995-present Proposal reviewer for NASA, NSF, National Academies, NCAR, FWO Belgium, Czech Science Foundation (57 mail-in and 24 at panels in Washington D. C. between 2001 and 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

- 2015- Vice chair HAO Director’s Strategic Advisory Committee

2011-ongoing	HAO Long-term Solar Variability Section Head
2003-ongoing	Supervisor, Project Scientist Dr. G. De Toma
2010-ongoing	HAO Scientific Advisory Committee
2011-2015	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
2011-2012	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)
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).
- 2005-2015 Mentored REU undergraduate summer students research: 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 50<sup>th</sup> 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

## **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 <sup>nd</sup> and 3 <sup>rd</sup> 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**

2016-2019	Co-Investigator: Determining the magnetic skeleton of the solar corona, NASA HSR, Malanushenko PI
2015-2016	Collaborator: 47 years of magnetism, NSF RAPID, Webb (Boston College) PI
2014-2019	Principal Investigator: “Towards improving space weather prediction through the observation and modeling of coronal magnetism, AFOSR
2014-	Collaborator: CoMP-Upgrade, NSF, Landi

2014-2017	Collaborator: “Waves and magnetism in the solar atmosphere”, NASA, Hindman
2011-2013	Principal Investigator: “Coronal Magnetometry: Building Tools for Discovery”, ISSI International Team in Space Science
2010	Co-Investiator, “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.
  - 2.10. Guhathakurta, M., A. Fludra, S. E. Gibson, D. Biesecker, and R. Fisher. Physical properties of a coronal hole from a coronal diagnostic spectrometer, Mauna Loa coronagraph, and LASCO observations during the Whole Sun Month. *Journ. of Geophys. Res.*, **104**, A5, 9679, 1999.
  - 2.11. Linker, J. A., Z. Mikic, D. A. Biesecker, R. J. Forsyth, S. E. Gibson, A. J. Lazarus, A. Lecinski, P. Riley, A. Szabo, and B. J. Thompson. Magnetohydrodynamic modeling of the solar corona during Whole Sun Month, *Journ. of Geophys. Res.*, **104**, A5, 9809, 1999.
  - 2.12. Strachan, L., Y.-K. Ko, A. V. Panasyuk, D. Dobrzycka, J. L. Kohl, M. Romoli, G. Noci, S. E. Gibson, D. A. Biesecker. Constraints on coronal outflow velocities derived from UVCS Doppler dimming measurements of in situ charge state data, *Space Science Reviews*, **87**, 1/2, 311, 1999.
  - 2.13. Strachan, L., A. Panasyuk, D. Dobrzycka, J. Kohl, G. Noci, S. Gibson, and D. Biesecker. Latitudinal dependence of outflow velocities from OVI Doppler dimming observations during the Whole Sun Month. *Journ. of Geophys. Res.*, **105**, 2345, 2000.
  - 2.14. Gibson, S. E., and B. C. Low. Three-dimensional and twisted: An MHD interpretation of on-disk observational characteristics of CMEs. *Journ. of Geophys. Res.*, **105**, 18187, 2000.
  - 2.15. Gibson, S. E., Global solar wind structure from solar minimum to solar maximum: Sources and evolution. *Space Science Reviews*, **97**, 1/4, 69, 2001.
  - 2.16. Guhathakurta, M., E. Sittler, R. Fisher, T. Kucera, S. Gibson, D. McComas, R. Skoug. Source region of high and low speed wind during the Spartan 201-05 flight. *Space Science Reviews*, **97**, 1/4, 45, 2001.
  - 2.17. Gibson, S. E., L. Fletcher, D. Alexander, D. A. Biesecker, J. Burkepile, G. Del Zanna, P. Demoulin, C. Mandrini, H. E. Mason, Y. Liu, N. Nitta, C. D. Pike, J. Qiu, Y.-K. Ko, B. Schmieder, and B. J. Thompson. Sigmoid structure and evolution: Results from the third Whole Sun Month campaign. *Astrophys. Journ.*, **574**, 1021, 2002.
  - 2.18. Del Zanna, G., S. E. Gibson, H. E. Mason, C. D. Pike, and C. H. Mandrini. Sigmoidal diagnostics with SOHO/CDS. *Adv. Space Research*, **30**, 551, 2002.
  - 2.19. Fan, Y., and S. E. Gibson. Emergence of a magnetic flux rope into a pre-existing coronal arcade. *Astrophys. Journ. Lett.*, **589**, L505, 2003.

- 2.20. Gibson, S. E., D. Foster, M. Guhathakurta, T. Holzer, and O. C. St. Cyr. Three-dimensional coronal density structures: Paper 1 – model. *Journ. of Geophys. Res.*, **108**, A12, SSH 7-1, CiteID 1444, 2003.
- 2.21. Fan, Y., and S. E. Gibson. Numerical simulations of 3D coronal magnetic field resulting from the emergence of twisted magnetic flux tubes. *Astrophys. Res.*, **609**, 1123, 2004.
- 2.22. Gibson, S. E., Y. Fan, C. Mandrini, G. Fisher, and P. Demoulin. Observational consequences of a magnetic flux rope emerging into the corona. *Astrophys. Journ.*, **617**, 600, 2004.
- 2.23. Ko, Y.-K., J. C. Raymond, S. E. Gibson, D. Alexander, L. Strachan, T. Holzer, H. Gilbert, O. C. St. Cyr, B. J. Thompson, C. D. Pike, H. E. Mason, J. Burkepile, W. Thompson, and L. Fletcher. Multialtitude observations of a coronal jet during the third Whole Sun Month campaign. *Astrophys. Journ.*, **623**, 519, 2005.
- 2.24. Gibson, S. E., D. Foster, J. Burkepile, G. de Toma, and A. Stanger. The calm before the storm: The link between quiescent cavities and CMEs. *Astrophys. Journ.*, **641**, 590, 2006.
- 2.25. Gibson, S. E., and Y. Fan. The partial expulsion of a magnetic flux rope. *Astrophys. Journ. Lett.*, **637L**, 65, 2006.
- 2.26. Fan, Y., and S. E. Gibson. On the nature of the X-ray bright core in a stable filament channel. *Astrophys. Journ.*, **641L**, 149, 2006.
- 2.27. Gibson, S. E., and Y. Fan. Coronal prominence structure and dynamics: a magnetic flux rope interpretation. *Journ. of Geophys. Res.*, **111**, A12103, doi:10.1029/2006JA011871, 2006.
- 2.28. Gibson, S. E., Y. Fan, T. Toeroek, and B. Kliem. The evolving sigmoid: evidence for magnetic flux ropes before, during, and after CMEs, in *Solar Dynamics and its Effects on the Heliosphere and Earth* (Berlin: Springer), *Space Science Reviews*, 124, 131, , 2006.
- 2.29. Fan, Y., and S. E. Gibson, Onset of coronal mass ejections due to the loss of confinement of coronal flux ropes, *Astrophys. Journ.*, 668, 1232, 2007.
- 2.30. Fuller, J., Gibson, S. E., De Toma, G., and Fan, Y., Observing the unobservable? Modeling coronal cavity density. *Astrophys. Journ.*, 678, 515, 2008.
- 2.31. Gibson, S. E., and Fan, Y. Partially-ejected flux ropes: implications for interplanetary coronal mass ejections. *Journ. of Geophys. Res.*, 113, CiteID A09103, 2008.
- 2.32. Tripathi, D., Gibson, S. E., Qiu, J., Fletcher, L., Liu, R., Gilbert, H., and Mason, H. E., Partially-erupting prominences: a comparison between observations and model-predicted observables. *A&A*, 498, 295, 2009

- 2.33. Schmit, D. J., Gibson, S. E., de Toma, G., Wiltberger, M., Hughes, W. J., and Riley, P., A novel metric for coronal MHD models. *JGR*, 114, CiteID A06101, 2009
- 2.34. Fuller, J. and Gibson, S. E., A survey of coronal cavity density profiles. *ApJ*, 700, 1205, 2009
- 2.35. Malanushenko, A., Longcope, D. W., Fan, Y., and Gibson, S. E., Additive self helicity as a kink mode threshold, *ApJ*, 702, 580, 2009
- 2.36. Gibson, S. E., Kozyra, J. U., De Toma, G., Emery, B. A., Onsager, T., and Thompson, B. J., If the Sun is so quiet, why is the Earth ringing? A comparison of two solar minimum intervals, *JGR*, 114, A09105, 2009
- 2.37. Schmit, D., Gibson, S. E., Tomczyk, S., Reeves, K. K., Sterling, A., Brooks, D. and Tripathi, D., Large-scale flows in coronal cavities, *ApJL*, 700, 96, 2009
- 2.38. Gibson, S. E., Kucera, T. A., Rastawicki, D., Dove, J., de Toma, G., Hao, J., Hill, S., Hudson, H. S., Marque, C., McIntosh, P. S., Rachmeler, L., Reeves, K. K., Schmieder, B., Schmit, D. J., Seaton, D. B., Sterling, A. C., Tripathi, D., Williams, D. R., Zhang, M., Three-dimensional morphology of a coronal prominence cavity, 724, 1133, *ApJ*, 2010
- 2.39. Dove, J. B., Gibson, S. E., Rachmeler, L. A., Tomczyk, S., and Judge, P., Coronal magnometry: Observational signatures of magnetic flux ropes, *ApJ Letters*, 731, 1, 2011
- 2.40. Schmit, D. J. and Gibson, S. E., Forward modeling cavity density: a multi-instrument diagnostic, *ApJ*, 733, 1, 2011
- 2.41. Webb, D. F., Cremades, H., Sterling, A. C., Mandrini, C. H., Dasso, S., Gibson, S. E., Haber, D. A., Komm, R. W., Petrie, G. J. D., McIntosh, P. S., Welsch, B. T., and Plunkett, S. P., The global context of solar activity during the Whole Heliosphere Interval campaign, *Solar Physics*, 274, 57, 10.1007/s11207-011-9787-5, 2011
- 2.42. Gibson, S. E., de Toma, G., Emery, B., Riley, P., Zhao, L., Elsworth, Y., Leamon, R. J., Lei, J., McIntosh, S., Mewaldt, R. A., Thompson, B. J., and Webb, D. F., WHI in the context of current solar minimum, *Solar Physics*, 274, 10.1007/s11207-011-9921-4, 2011 **(invited review)**
- 2.43. Thompson, B. J., Gibson, S. E., Schroeder, P. C., Webb, D. F., Arge, C. N., Bisi, M. M., de Toma, G., Emery, B. A., Galvin, A. B., Haber, D. A., Jackson, B. V., Jensen, E. A., McIntosh, P. S., Petrie, G. J. D., Plunkett, S. P., Qian, L., Riley, P., Seuss, S. T., Tokumaru, M., Welsch, B. T., Woods, T. N., A snapshot of the sun near solar minimum: the Whole Heliosphere Interval, *Solar Physics*, 274, 10.1007/s11207-011-9891-6, 2011 **(invited review)**
- 2.44. Bisi, Mario M., Thompson, B. J., Emery, B. A., Gibson, S. E., Leibacher, John, and van



- Driel-Gestelyi, Lidia, The Sun-Earth connection near solar minimum: placing it into context, *Solar Physics*, 274, 10.1007/s11207-011-9915-2, 2011
- 2.45. Reeves, K. K., Gibson, S. E., Kucera, T. A., Hudson, H. S., Thermal properties of coronal cavities observed with the X-ray telescope on Hinode, *ApJ*, 746, 146, 2012.
  - 2.46. Love, J. L., Rigler, J. E., and Gibson, S. E., Geomagnetic detection of the nonaxisymmetric solar dynamo and the historical peculiarity of minimum 23-24, *GRL*, 39, L04102, 2012.
  - 2.47. Kucera, T. A., Gibson, S. E., Schmit, D. J., Landi, E., and Tripathi, D., Temperature and EUV intensity in a coronal prominence cavity, *ApJ*, 757, 73, 2012.
  - 2.48. Forland, B. C., Gibson, S. E., Dove, J. B., Rachmeler, L. A., and Fan, Y., Coronal cavity survey: morphological clues to eruptive magnetic topologies, *Topical Issue in Solar Physics on Coronal Magnetism*, 288, 603, 2013.
  - 2.49. Rachmeler, L. A., Gibson, S. E., Dove, J., DeVore, C. R., and Fan, Y., Polarimetric observational properties of flux ropes and sheared field in the corona, *Topical Issue in Solar Physics on Coronal Magnetism*, 288, 61, 2013.
  - 2.50. Tian, H, Tomzyck, S., McIntosh, S. W., Bethge, C., de Toma, G., and Gibson, S., CoMP observations of coronal mass ejections, *Topical Issue in Solar Physics on Coronal Magnetism*, 288, 63, 2013.
  - 2.51. Bak-Steslicka, U., Gibson, S. E., Fan, Y., Bethge, C., Forland, B., and Rachmeler, L., The magnetic structure of solar prominence cavities: new observational signature revealed by coronal magnetometry, *ApJL*, 770, 28, 2013.
  - 2.52. Zhao, L., Gibson, S. E., and Fisk, L. A., Implications of proton mass flux extremes for solar wind acceleration in cycle minima, *JGR*, 118, 10.1002/jgra.50335, 2013.
  - 2.53. Schmit, D, and Gibson, S. E., Diagnosing the prominence-cavity connection, *ApJ*, 770, 35, 2013.
  - 2.54. Zhao, L., Landi, E. and Gibson, S. E., Two novel parameters to evaluate the global complexity of the Sun's magnetic field and to track the solar cycle, *ApJ*, 773, 157, 2013.
  - 2.55. Tripathi, D., Reeves, K., Gibson, S. E., Joshi, N. C., and Shrivastava, A, SDO/AIA observations of a partially-erupting prominence, submitted, *ApJ*, 778, 142, 2013.
  - 2.56. Schmit, D. J., Gibson, S. E., Luna, M., Karpen, J., Innes, D., The prominence mass supply and the cavity, submitted, *ApJ*, 779, 156, 2013.
  - 2.57. Schrijver, C.J., Kauristie, K., Aylward, A. D., Denardini, C. M., Gibson, S., Glover, A., Gopalswamy, N. Grande, M., Hapgood, M., Heynderickx, D., Jakowski, N., Kalegaev, V. V., Lapenta, G., Linker, J. A., Liu, S., Mandrini, C. H., Mann, I. R., Nagatsuma, T.,

Nandy, D., Obara, T., O'Brien, T. P., Onsager, T., Opgenoorth, H. J., Terkildsen, M., Valladares, C. E., and N. Vilmer, Understanding space weather to shield society: A global road map for 2015-2025 commissioned by COSPAR and ILWS. *Advances in Space Research*, **55**, 2745-2807, DOI: [10.1016/j.asr.2015.03.023](https://doi.org/10.1016/j.asr.2015.03.023), 2015

- 2.58. Gibson, S. E., Kucera, T. A., White, S. M., Dove, J. B., Fan, Y., Forland, B. C., Rachmeler, L. A., Downs, C. and Reeves, K. K., FORWARD: A Toolset for Coronal Magnetometry, *Front. Astron. Space Sci.*, <http://dx.doi.org/10.3389/fspas.2016.00008>, 2016
- 2.59. Bak-Steslicka, U., Gibson, S. E., and Chmielewska, E., Line-of-sight velocity as a tracer of cavity magnetic structure, *Front. Astron. Space Sci.*, <http://dx.doi.org/10.3389/fspas.2016.00007>, 2016
- 2.60. Ko, Y.-K., Moses, J. D., Laming, J. M., Strachan, L., Tomczyk, S., Auchere, F., Casini, R., Fineschi, S., Gibson, S., Knoelker, M., Korendyke, C., McIntosh, S. W., Romoli, M., Rybak, J., Socker, D., Vourlidis, A., and Wu, Q., Waves and Magnetism in the Solar Atmosphere (WAMIS), *Front. Astron. Space Sci.*, <http://dx.doi.org/10.3389/fspas.2016.00001>, 2016

### 3. Other External Refereed Publications

- 3.1. Ko, Y.-K., Galvin, A. B., Gibson, S., and Strachan, L., The electron temperature profile in the north polar coronal hole during the WSM inferred by SWICS/Ulysses, LASCO, and UVCS data, *EOS Transactions, American Geophysical Union*, 79(17), Spring Meeting Supplement, S283, 1998.
- 3.2. Strachan, L., Panasyuk, A. V., Dobrzycka, D., Gibson, S., Biesecker D. A., Ko, Y.-K., Galvin, A. B., Romoli, M., Kohl, J. L., Coronal outflow velocities in a 3D coronal model determined from UVCS Doppler dimming observations, *EOS Transactions, American Geophysical Union*, 79(17), Spring Meeting Supplement, S278, 1998.
- 3.3. Fludra, A., Strachan, L., Alexander, D., Bagenal, F., Biesecker, D. A., Dobrzycka, D., Galvin, A. B., Gibson, S., Hassler, D., Ko, Y.-K., and 8 co-authors, Empirical models of temperature, densities, and velocities in the solar corona, *EOS Transactions, American Geophysical Union*, 79(17), Spring Meeting Supplement, S278, 1998.
- 3.4. Gibson, S. E., D. Alexander, D. Biesecker, R. Fisher, M. Guhathakurta, H. Hudson, and B. J. Thompson. Modeling CMEs in three dimensions using an analytic MHD model. *Solar Wind 9*, eds. S. R. Habbal, R. Esser, R. V. Hollweg, & P. A. Iseberg, **645**, Woodbury, New York, 1999.
- 3.5. Gibson, S. E., and M. S. Miesch. Sun. *Space Sciences for Students Encyclopedia*, Macmillan Reference, USA, 2002.
- 3.6. Sittler, E. C., Jr., L. Ofman, S. Gibson, M. Guhathakurta, J. Davila, R. Skoug, A.

- Fludra, and T. Holzer. Development of multidimensional MHD model for the solar corona and solar wind, *Solar Wind Ten: Proceedings of the Tenth International Solar Wind Conference*. AIP Conference Proceedings, **679**, 113, 2003.
- 3.7. Committee on Solar and Space Physics, Space Studies Board (12 members including S. Gibson). Plasma physics of the local cosmos. *National Academies Press*, 2003.
  - 3.8. Committee on Solar and Space Physics, Space Studies Board (17 members including S. Gibson). Solar and space physics and its role in space exploration. *National Academies Press*, 2004.
  - 3.9. Committee on Solar and Space Physics, Space Studies Board (17 members including S. Gibson). Understanding the Sun and solar system plasmas: Future directions in solar and space physics (40-page color booklet based on the report, The Sun to the Earth – and beyond: A decadal research strategy in solar and space physics). *National Academies Press*, 2004.
  - 3.10. Committee on Solar and Space Physics, Space Studies Board (14 members including S. Gibson). Distributed arrays of small instruments for solar-terrestrial research: A workshop report. *National Academies Press*, 2006.
  - 3.11. Panel on Radio, Millimeter and Submillimeter from the Ground (13 members including S. Gibson). Astro2010 Decadal Survey Panel Report.
  - 3.12. De Toma, G., Gibson, S. E., Emery, B. A., and Kozyra, J. U., Solar Cycle 23: An Unusual Solar Minimum?. *Solar Wind Twelve: Proceedings of the Twelfth International Solar Wind Conference*, AIP Conference Proceedings, XX, 667, 2010.
  - 3.13. Gibson, S. E. and Zhao, L., A porcupine sun? Implications for the solar wind and Earth, *Proceedings of IAU S286*, 2012.
  - 3.14. Rachmeler, L. A., Casini, R., and Gibson, S. E., Interpreting coronal polarization observations, ASP conference series, 2012.
  - 3.15. Zhao, L., Gibson, S. E., and Fisk, L. A., Solar wind flux extremes and their association with pseudostreamers, *Solar Wind 13 Proceedings*, in press, 2012.
  - 3.16. Bak-Steslicka, U., Gibson, S. E., Fan, Y., Betghe, C., Forland, B., Rachmeler, L. A., The spatial relation between EUV cavities and linear polarization signatures, *Proceedings IAU Symposium No. 300*, B. Schmieder, J.-M. Malherbe and Shi Wu, eds., 2013.
  - 3.17. Forland, B., Gibson, S., Dove, J., and Kucera, T., The solar physics FORWARD codes: Now with widgets! *Proceedings IAU Symposium No. 300*, B. Schmieder, J.-M. Malherbe and Shi Wu, eds., 2013.
  - 3.18. Schmit, D. and Gibson, S. E., The formation of a cavity in a 3D flux rope, *Proceedings*

IAU Symposium No. 300, B. Schmieder, J.-M. Malherbe and Shi Wu, eds., 2013.

- 3.19. Gibson, S. E., Magnetism and the Invisible Man: the secrets of coronal cavities, Proceedings IAU Symposium No. 300, B. Schmieder, J.-M. Malherbe and Shi Wu, eds., 2013, **invited review**.
- 3.20. Committee on a Decadal Strategy in Solar and Space Physics (Heliophysics), Solar and Space Physics: A science for a technological society, *National Academies Press*, 2013.
- 3.21. Gibson, S. E., Data-Model Comparison Using FORWARD and CoMP, Proceedings IAU Symposium No. 305, K. N. Nagendra, S. Bagnulo, R. Centeno and M. Martinez Gonzalez, eds., 2014
- 3.22. Strachan, L., Ko, Y.-K., Moses, J. D., Laming, J. M., Auchere, F., Casini, R., Fineschi, S., Gibson, S., Knoelker, M., Korendyke, C., McIntosh, S., Romoli, M., Rybak, J., Socker, D., Tomczyk, S., Vourlidas, A., and Wu, Q., Waves and Magnetism in the Solar Atmosphere (WAMIS), Proceedings IAU Symposium No. 305, K. N. Nagendra, S. Bagnulo, R. Centeno and M. Martinez Gonzalez, eds., 2014
- 3.23. Gibson, S. E., Coronal cavities: Observations and implications for the magnetic environment of prominences, Solar Prominences, O. Engvold and J.-C. Vial eds., Astrophysics and Space Science Library, Volume 415, ISBN-978-3-319-10415-7, Springer International Publishing Switzerland, 323, 2015 (**invited book chapter**).
- 3.24. Lotko, W., et al., NSF AGS-Geospace Portfolio Review, 2016

#### **4. Papers Submitted to Refereed Journals / Papers in Preparation**

- 4.1. N. E. Raouafi, P. Riley, S. Gibson and V. Bommier, Diagnosics of the Coronal Magnetic Field Through the Hanle Effect in UV and IR Lines, submitted to *Front. Astron. Space Sci.*, 2016
- 4.2. Tomczyk, S., Landi, E., Burkepile, J. T., Casini, R., DeLuca, E. E., Fan, Y., Gibson, S. E., Judge, P. G., Lin, H., McIntosh, S. W., deToma, G., deWijn, A., and Zhang, J., COSMO – The Coronal Solar Magnetism Observatory, submitted to *JGR*, 2016
- 4.3. Kevin Dalmasse, Doug Nychka, Sarah Gibson, Yuhong Fan, Natasha Flyer, A novel statistical method for diagnosing the three-dimensional coronal magnetic field, in preparation
- 4.4. Mei Zhang, Sarah Gibson and Cooper Downs, Diagnosing coronal evolution using Stokes signals: The case of coronal magnetic field reversal, in preparation
- 4.5. 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

- 6.1. Gibson, S. E., F. Bagenal, D. Biesecker, M. Guhathakurta, J. T. Hoeksema, and B. J. Thompson. Modeling a simple coronal streamer during Whole Sun Month. *Proc. Of the Fifth SOHO Workshop*, ESA SP-404, 319, 1997.
- 6.2. Gibson, S. E., D. Biesecker, R. Fisher, R. A. Howard, and B. J. Thompson. Fitting a 3-D analytic model of the coronal mass ejection to observations. *Proc. Of the 31<sup>st</sup> ESLAB Symposium*, ESA SP-415, 111, 1997.
- 6.3. Gibson, S., and P. Scherrer. Supergranule power leakage through an observing mask. *IAU Symp. 181: Sounding solar and stellar interiors, Poster volume*, eds. J. Provost & F.-X. Schmider, 1998.
- 6.4. Gibson, S. E., H. E. Mason, D. Pike, and P. R. Young. Searching for sigmoids in SOHO/CDS. *Plasma Dynamics and Diagnostics in the Solar Transition Region and Corona*, eds. J. C. Vial & B. Kaldeich-Schurmann, 1999.
- 6.5. Gibson, S. E., B. C. Low, K. D. Leka, Y. Fan, and L. Fletcher. Magnetic flux ropes: would we know one if we saw one?. *SOLMAG 2002. Proceedings of the Magnetic Coupling of the Solar Atmosphere Euroconference and IAU Colloquium 188, 11 - 15 June 2002, Santorini, Greece*. Ed. H. Sawaya-Lacoste. ESA SP-505. Noordwijk, Netherlands: ESA Publications Division, ISBN 92-9092-815-8, 265, 2002.
- 6.6. Fan, Y., S. Gibson, and W. Manchester, 2005: The emergence and evolution of twisted magnetic flux ropes in the solar corona. *Proceedings of the International Scientific Conference on Chromospheric and Coronal Magnetic Fields*, , D. Innes, A. Lagg, S. Solanki, and D. Danesy, Eds., Katlenburg-Lindau, Germany, ESA SP-596, .
- 6.7. Gibson, S. E., and Y. Fan. Partially ejected flux ropes: implications for space weather. *Solar Activity and its Magnetic Origin: Proceedings of IAU Symposium No. 233*, Volker Bothmer, Ahmed Abdel Hady eds., 319, 2006.
- 6.8. Gibson, Sarah. Career vs. family – How “the Man” can help. *STATUS, Publication of the American Astronomical Society Committee on the Status of Women*, January, 2006.
- 6.9. Gibson, Sarah, Tom Ayres, Tim Bastian, Gianna Cauzzi, Craig Deforest, Jay Frogel, Todd Hoeksema, Jeff Kuhn, and Han Uitenbroek, *The Future of Ground-based Solar Physics: A report of the AURA Solar Decadal Committee*, 2008
- 6.10. Gibson, Sarah, Tim Bastian, Haosheng Lin, B. C. Low, Steve Tomczyk, *Magnetically-driven activity in the solar corona: A path to understanding the energetics of astrophysical plasmas*, Astro2010: The Astronomy and Astrophysics Decadal Survey, Science White papers, no. 94, 2009

- 6.11. Giampapa, Mark S., Gibson, Sarah, Harvey, J. W., Hill, Frank, Norton, Aimee A., Pevtsov, A., *Causes of activity*, Astro2010: The Astronomy and Astrophysics Decadal Survey, Science White papers, no. 92, 2009
- 6.12. Webb, David F., Gibson, Sarah E., and Thompson, Barbara J., *Whole Heliosphere Interval: Overview of JD16*, Highlights of Astronomy, Volume, 14, Ian F. Corbett, ed., 2009
- 6.13. De Toma, G., Gibson, S. E., Emery, B. A., and Arge, C. N., The minimum between cycle 23 and 24: Is sunspot number the whole story?, Proceedings of SOHO 23 workshop, ASP Conference Series, Volume XX, Steven Cranmer, Todd Hoeksema, and John Kohl, eds., 2010
- 6.14. Gibson, S. E., Webb, D. F., and Thompson, B. J., The Whole Heliosphere Interval in the context of the current solar minimum, Proceedings of SOHO 23 workshop, ASP Conference Series, Volume 428, Steven Cranmer, Todd Hoeksema, and John Kohl, eds., 223, 2010
- 6.15. Judge, P., Ammann, C., Ayres, T., Brown, T., Dikpati, M., Egeland, R., Giampapa, M., Gibson, S., Hall, J., Harder, J., Henry, G., Karoff, C., Knoelker, M., Kopp, G., Lockwood, W., McIntosh, S., Martens, P., Mathur, S., Metcalfe, T., Miesch, M., Pevtsov, A., Radick, R., Rast, M., Rempel, M., Saar, S., Soderblom, D., Snow, M., Thompson, M., de Toma, G., Woodard, M., Solar-stellar research and the dynamo problem, White Paper submitted to NASA, NSF program officers May 2014
- 6.16. Gibson, S. E., Kucera, T. A., Casini, R., Dove, J., Forland, B., Judge, P., Rachmeler, L., FORWARD: Forward modeling of coronal observables, Astrophysics Source Code Library, record ascl: 1405.007, 2014
- 6.17. Schrijver, C. J., Fletcher, L., van Driel-Gesztelyi, L., Asai, A., Cally, P. S., Charbonneau, P., Gibson, S. E., Gomez, D., Hasan, S. S., Veronig, A. M., and Yan, Y., IAU commission 10 “Solar Activity”: Legacy report and triennial report for 2012-2015, Transactions of the IAU, <http://arxiv.org/abs/1510.03348>, 2015

## 7. Selected Presentations

200+ papers at conferences and symposia including the following invited 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 36<sup>th</sup> 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 75<sup>th</sup> anniversary, Boulder, 2015 (invited talk)
- 7.57 “The Science of COSMO”, HAO 75<sup>th</sup> 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 “Magnetic Field Generation, Emergence, and Expansion: Observations”, COSPAR meeting, Istanbul, Turkey, 2016 (invited review)
- 7.64 “CMEs and their Geospace Impacts”, COSPAR meeting, Istanbul, Turkey, 2016 (invited review)