

Curriculum Vitae

Sarbani Basu, Ph.D.

William K. Lanman Jr, Professor, Department of Astronomy, Yale University
617 Kline Tower, 619 Prospect Street, New Haven, CT 06511, USA
E-mail: sarbani.basu@yale.edu, Ph:+1-203-432-3028 (direct)
ORCID: [0000-0002-6163-3472](https://orcid.org/0000-0002-6163-3472)

Education:

1986 B.Sc. in Physics, Women's Christian College, Chennai, India
1988 M.Sc. in Physics, University of Poona, Pune, India
1993 Ph.D. in Physics, Tata Institute of Fundamental Research, Mumbai, India

Professional Preparation:

1993-1994 Post-Doctoral Researcher, Queen Mary & Westfield College, London, U.K.
1994-1997 Post-Doctoral Researcher, Theoretical Astrophysics Center, Univ. of Aarhus, Denmark
1997-1999 Member, Institute for Advance Study, Princeton, NJ, USA

Academic positions held:

2022-2022 Klaus Tschirra Guest Professor, Heidelberg Institute for Theoretical Studies
2021- William K. Lanman Jr. Professor of Astronomy, Yale University
2016-2022 Chair, Department of Astronomy, Yale University
2011-2016 Director of Graduate Admissions, Department of Astronomy, Yale University
2005- Professor, Department of Astronomy, Yale University
2004-2005 Associate Professor, Department of Astronomy, Yale University
2002-2007 Director of Graduate Studies, Department of Astronomy, Yale University
2000-2004 Assistant Professor, Department of Astronomy, Yale University

Honors and Awards:

- 2024: NASA's Robert H. Goddard Award for Exceptional Achievement for Science to the Solar Dynamics Observatory team
- 2020: Fellow of the American Astronomical Society
- 2018: The George Ellery Hale Prize of the Solar Physics Division of the American Astronomical Society
- 2015: Fellow of the American Association for the Advancement of Science
- 2004: NSF Career grant
- 2002: Hellman Family Faculty Fellowship, Yale University
- 1996: The M.K. Vainu Bappu Gold Medal of the Astronomical Society of India.

Research Interests:

- Helioseismology: Helioseismic study of the structure and dynamics of the Sun; using the Sun as a laboratory to test the physics therein; refine techniques of helioseismic inversion; study of solar-cycle related changes in the Sun;
- Solar and Stellar structure: modeling solar structure; study of solar variability; physical properties of stellar interiors.
- Asteroseismology: Studying the properties of pulsating stars; developing techniques of using data to infer properties of stars.

Publications:(Access at http://bit.ly/Basu_papers_ADS)

1 full-length book, <http://press.princeton.edu/titles/11170.html>

As of Dec 31, 2024:

315 peer reviewed publications.

> 30000 citations as per the Astrophysics Data System (ADS), H index = 91

> 38000 citations as per Google Scholar, H index = 104

Membership of professional organizations:

1. International Astronomical Union
2. American Astronomical Society
3. American Association for the Advancement of Science
4. American Geophysical Union
5. American Physical Society
6. Astronomical Society of India

Managerial/ supervisory/ advisory positions

| | |
|---------------|---|
| 2024-present | Member, Editorial Board, <i>Living Reviews of Solar Physics</i> |
| 2022-2024 | Member, Steering Committee of the Solar Physics and Space Sciences Decadal Survey |
| 2023-present | Member, Solar Observatories Council |
| 2023-present | Member, Scientific Advisory Board, Indian Institute Astrophysics, Bangalore, India |
| 2022-present | Member, Scientific Advisory Board, Leibniz Institute for Astrophysics, Potsdam, Germany |
| 2021-2022 | Chair, Nominating Committee, Association of Universities for Research in Astronomy (AURA) |
| 2019-2022 | Member, selection committee for the Dannie Heineman Prize of the American Astronomical Society |
| 2019-2021 | Chair, Panel on Stars, the Sun and Stellar Populations for the 2020 Astronomy Decadal survey |
| 2019-present | Member, Science Advisory Council, Stamford Museum and Nature Center |
| 2018- 2021 | Deputy Chair, Board of Directors, Association of Universities for Research in Astronomy (AURA) |
| 2017- 2023 | Member, Advisory Board, <i>Solar Physics</i> |
| 2016- 2022 | Chair, Department of Astronomy, Yale University |
| 2016-2016 | Chair, Mikulsky Archive for Space Telescopes (MAST) Users' Group |
| 2015- present | Member, Board of the TESS Asteroseismic Science Consortium |
| 2014- 2021 | Member, Board of Directors, Association of Universities for Research in Astronomy (AURA) |
| 2014- present | AURA Member Representative for Yale University |
| 2014 | Member, Visiting Committee to evaluate laboratory astrophysics funded by the French Commissariat à l'Energie Atomique (CEA) |
| 2014 | Member, Committee to evaluate performance of the Director of the Space Telescope Science Institute |
| 2013-2015 | Member, Mikulsky Archive for Space Telescopes (MAST) Users' Group |
| 2012-2013 | National Solar Observatory's Committee of Visitors |
| 2011 | Member, Member, AURA committee for evaluating National Solar Observatory's leadership |
| 2009- present | Member, Steering Committee, <i>Kepler</i> Asteroseismic Science Consortium |
| 2008 | Committee of Visitors, ATM division of the National Science Foundation |

2006-2009 Management and Operations Working Group (MOWG) of NASA’s Living With a Star program
 2005-2011 Member, National Solar Observatory Users’ Committee
 2003-2010 Member, Scientific Advisory Committee of the Global Oscillation Network Group

Service at Yale:

2001-2002 Director of Graduate Admissions, Department of Astronomy
 2002-2007 Director of Graduate Studies, Department of Astronomy
 2004-2004 Member, Committee to select Prize Teaching Fellows
 2005-2006 Member, Yale College Steering Committee
 2005-2006 Member, *ad hoc* Committee on International Students
 2005-2006 Member, Executive Committee Graduate School
 2009-2010 Member, Social Sciences Tenure Committee
 2009-2011 Member, Yale College’s Sexual Harassment Grievance Board
 2010-present Member, University Advisory Committee of the Yale-New Haven Teachers’ Institute
 2010-2012 Member, Graduate School Committee on Regulations and Discipline
 2012-2013 Member, Information & Technology Services Research Technologies Committee
 2013-2014 Member, Steering Committee, Yale College
 2014-2014 Ad hoc Review Committee to consider appeal to a tenure decision
 2014-present Member Representative for Yale to AURA
 2014-2016 Member, Physical Sciences and Engineering Tenure and Advisory Committee
 2016-2022 Chair, Astronomy Department
 2023-present Member, Faculty Review Committee
 2023-2024 Colloquium organizer, Department of Astronomy
 2023-2024 Chair, GSAS Committee on Regulations and Discipline
 2024-present Member, Physical Sciences Tenure and Advisory Committee

Teaching experience:

Yale (2000 – present; each class taught multiple times)

| | |
|-----------------------------|---|
| Stars and Their Evolution | Calculus-based undergraduate introductory class. |
| Stellar Astrophysics | Graduate/Advanced undergraduate level class |
| The Physics of Astrophysics | Graduate level class; mandatory for all graduate students |
| Radiative Processes | Graduate/Advanced undergraduate level class |
| Solar Physics | Graduate/Advanced undergraduate class |

Aarhus University (1994-1997):

| | |
|---------------------------------|--|
| Stellar Structure and Evolution | (a)Substitute lecturer for graduate level class (10 lectures over 2 years). (b)Supervised problem-solving sessions (3 semesters). |
| Stellar oscillations | (a) Substitute lecturer (2 lectures). (b)Supervised problem-solving sessions (3 semesters) |

Queen Mary and Westfield College (1993-1994)

| | |
|---------------------------|---|
| Mathematics for Engineers | Conduct problem-solving classed (2 semesters) |
|---------------------------|---|

Miscellaneous schools

| | |
|------|--|
| 2012 | Lecturer, Winter School on Astronomical Surveys, Tata Institute of Fundamental Research, Mumbai, India |
| 2012 | Lecturer, Summer School on Solar Physics, Boston University |
| 2010 | Lecturer, XXII Canary Island Winter School “Asteroseismology”, La Laguna, Tenerife, Spain |
| 2006 | Lecturer, Kodaikanal School on Solar Physics, Kodaikanal Solar Observatory, India |

- 2006 Lecturer, Program for Talented Youth, Yale University
- 2000 Lecturer on Helioseismology at the Theoretical Advanced Study Institute (TASI), Boulder, CO
- 2000 Lecturer, Program for Talented Youth, Yale University

Public Outreach and Engagement:

1. Multiple public lectures, list at end of this document
2. Leader, Yale-New Haven Teachers' Institute Program on "Solar Variability" in summer 2005. The program counted as continuing education and training for Public School Teachers
3. Leader, Yale-New Haven Teachers' Institute Program on "Astronomy, Mathematics and Physics of the Solar System" in summer 2007. The program counted as continuing education and training for Public School Teachers
4. In 2012 along with the Peabody Museum organized a summer program on the Sun for teachers who teach grades 3-7 in New Haven Public Schools
5. In 2013 along with the Peabody Museum organized a summer program on the Sun for teachers who teach grades 8-10 in New Haven Public Schools
6. Leader, Yale National Initiative program on "The Sun, the Solar System, and Us" during summer 2021. The Yale National Initiative is the US-wide program of the Yale New-Haven Teachers' Institute.
7. Leader, Yale National Initiative program on "Alien Earths" during summer 2022. The Yale National Initiative is the US-wide program of the Yale New-Haven Teachers' Institute.
8. Instructor, 2 1-hour intensive sessions of the Yale Pathways Program 2023, entitled "Our Explosive Sun"

Research supervision and mentorship:

1. *Post-doctoral:* Matthew Templeton (2000-2002, currently at the American Organization of Variable Star Observers), LingHuai Li (2002-2004), Anwesh Mazumdar (2005-2007, currently at the Homo Bhabha Centre for Science Education, Mumbai India), Chia-Hsien Lin (2006 - 2007, currently at the Institute of Space Science, National Central University, Taiwan), Sebastien Deheuvels (2010 - 2012; currently faculty at University of Toulouse). Jean McKeever (2017-2020), Samaiyah Farid (2020 – 2022)
2. *Research Scientists:* LingHuai Li (2004 - 2012)
3. *Graduate Students:* Charles Baldner (2006 - 2010), Lisa Esch (2008 - 2015), Joel Tanner (2008 - 2013), Ning Gai (visiting student from Beijing Normal University; 2009 - 2010), John M. Brewer (2011 - 2016), Earl Bellinger (2016- 2017, visiting student from Max-Planck Inst. Goettingen), Lucas Viani (2017-2020), Joel Ong J.M. (2018-2022), Christopher Lindsay (2020-present)
4. *Post-baccalaureate student:* Courtney Watson (2019-2020)
5. *Research projects for graduate students:* Hugh Crow l(2002), Brooke Simmons (2002), Jeffry Van Duyne (2002), R. Katherine Vieira (2003), Andrew Cantrell (2004), Lisa Ferrara (2007), Joel Tanner (2007), Ana Bonaca (2011), John M. Brewer (2011), Joseph Schmitt (2014)
6. *Undergraduate senior theses:* Daniel Isquith (2002), Braxton Collier (2004-2005), Ronli Diakow (2005-2006), Jeffrey Z. Thompson (2005-2006), Archer Kinnane (2017-2018), Katherine Melbourne (2018-2019), Wesley Machado Andrade de Aguiar (2023-present)
7. *Undergraduate research projects:* Catherine Finlay IZARD (2003), Anna Mandel (2004), Braxton Collier (2005), Evan Blasy (2017-2019), David Saunders (2020-present), Daniel Chang (2021-2024), Wesley Machado Andrade de Aguiar (2023-2024)
8. *Freshman advising:* Freshman advisor, academic years 2001-2003, 2005-2007, 2009-2011, 2012-2013, 2017-present, for freshmen of Timothy Dwight College, Yale University (three/four advisees each year).

Funding history: A successful record of obtaining external funding, including an NSF CAREER Award.

1. 2000-2004: PI NASA grant NAG5-10912 (\$ 157,358), “Probing Cycle-Related Changes in the Outer Layers of the Ring-Diagram Analysis.”
2. 2002-2005: PI NSF Grant, ATM 026130 (\$ 347,314), “Solar Variability: Modeling and Helioseismic Studies.”
3. 2006-2012: Co-I, NASA project “Helioseismic and Magnetic Imager for Solar Dynamics Observatory,” (\$ 357,490 for Co-I).
4. 2004-2009: P.I., NSF Career grant (\$597,442), “CAREER: Solar Variability in the Classroom and in Research.”
5. 2006-2009: P.I., NASA grant NNG06GD13G (\$ 193,931) “Probing the structure and dynamics of the outer layers of the Sun”,
6. 2008-2011: P.I., NSF grant ATM 0737770 (\$ 399,383) “Helioseismology and Solar Magnetic Fields: Studying the forward problem”
7. 2009-2012: P.I., NASA ATFP grant NNX09AJ53G (\$ 369,534) “Modeling convection in stars: from 3D simulations to 1D approximations”
8. 2010-2013: P.I., NASA grant NNX10AE60G (\$ 373,404) “The structure and dynamics of the solar interior during the minimum of cycle 24”
9. 2011-2014: P.I. NASA Education and Public Outreach grant NNX11AH34G (\$310, 820) “ Solar Cycle Investigations: NASA Science Exploration for Middle School Students and Teachers”
10. 2011-2014: P.I. NSF grant AST-1105930 (\$ 345,486) “Journey to the Centre of Stars: Testing Stellar Evolution with Asteroseismology”
11. 2013-2016: P.I. NASA grant NNX13AE70G (\$ 346,017) “Charting the properties of stars in the Kepler field to study the Galaxy”
12. 2015-2018: P.I. NSF grant AST-1514676 (\$ 433,565) “Decreasing Systematic Errors in Estimates of Stellar Ages”
13. 2016-2019: P.I. NASA grant NNX16AI096 (\$372,191) “The Giants in The Kepler Fields”
14. 2016-2017: US P.I. for NASA K2 guest observer grant NNS16AE65G (\$18,000) “Asteroseismology of solar-type stars with K2 (K2GO2)”
15. 2017-2018: US P.I. for NASA K2 guest observer grant NNX17AL49G (\$40,000) “Asteroseismology of solar-type stars with K2 (K2GO4)”
16. 2018-2019: US P.I. for NASA K2 guest observer grant 80NSSC18K0363 (\$35,000) “Asteroseismology of solar-type stars with K2 (K2GO5)”
17. 2018-2021: P.I. NASA TESS Guest Investigation grant (\$70,000) “Investigating the evolution of Helium”
18. 2021-2024: P.I. NSF grant AST-2205026 (\$449,068) “Asteroseismic Analyses of the Physics of red-giant Interiors”
19. 2023-2026: P.I. NASA grant 80NSSC23K0563 (\$400,439) “Seismology of the Solar tachocline”

Peer-review activities:

1. Referee for Astrophysical Journal, Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, Reviews of Modern Physics, Solar Physics, Nature, Physical Review Letters, Europhysics Letters, National Academy of Sciences
2. Proposal reviewer for NASA and NSF
3. Reviewer for the European Research Council (ERC)
4. Reviewer for United Kingdom Particle Physics and Astrophysics

5. Reviewer for the Austrian Science Fund (FWF)
6. Reviewer for Canadian Space Agency
7. Reviewer for German Science Foundation
8. Reviewer for the Belgian Science Foundation
9. Reviewer for the Knut & Alice Wallenberg Foundation, Sweden

Scientific Organizing Committees of Meetings:

1. Member, Scientific Organizing Committee, SOHO 6/GONG 98 Workshop, Boston, June 1998
2. Member, Scientific Organizing Committee, SOHO 12/GONG 02 Workshop, Big Bear, October 2002
3. Member, Scientific Organizing Committee, GONG2006/SOHO 18/Helas 1 meeting “Beyond the Spherical Sun,” Sheffield, U.K., August 2006
4. Member, Scientific Organizing Committee, SOHO 17 meeting “10 Years of SOHO and Beyond”, Sicily, May 2006.
5. Chair, Scientific and Local Organizing Committees, GONG 2004 -SOHO 14 meeting, New Haven, CT, USA, July 2004
6. Member, Scientific Organizing Committee, 2010 Sagan Summer Workshop
7. Member, Scientific Organizing Committee, *Kepler* Asteroseismic Science Consortium meetings 2011 (Boulder, USA), 2012 (Hungary), 2013 (Sydney, Australia)
8. Member, Scientific Organizing Committee, “Fifty Years of Seismology of the Sun and Stars,” Tucson, AZ, May 2013
9. Member, Scientific Organizing Committee, “New advances in stellar physics: from microscopic to macroscopic processes”, Roscoff, France, May 2013
10. Member, Scientific Organizing Committee, 19th Cambridge Cool Stars Meeting, Uppsala, Sweden, 2016
11. Member, Scientific Organizing Committee, TESS Asteroseismic Science Consortium meetings 2016 (Terceira, Portugal), 2017 (Birmingham, UK), 2020 (Leuven, Belgium)
12. Member, Scientific Organizing Committee, 20th Cambridge Cool Stars Meeting, Boston, 2018
13. Member, Scientific Organizing Committee, Sun, Space Weather and Solar-Stellar Connections — An international conference commemorating 125 years of the Kodaikanal Solar Observatory, January 2025

Invited Colloquia and Seminars:

1. *Spatial and Temporal Evolution of Gas and Heavy Elements in the Galaxy*, Indian Institute of Science, Bangalore, India, January, 1993
2. *Multiplicity Corrected Initial Mass Function of the Solar Neighbourhood*, Indian Institute for Astrophysics, Bangalore, India, January, 1993
3. *Spatial and temporal evolution of gas and heavy elements in the Galaxy*, Queen Mary and Westfield College, London, U.K., September 1993
4. *The Seismic Sun*, Institute for Advanced Study, Princeton, NJ, January 1997
5. *The Seismic Sun*. Rutgers University, New Brunswick NJ, November 1997
6. *The Seismic Sun*, Yale University, New Haven CT, January 1999
7. *Testing Stellar Equations of State Using Helioseismology*, Tata Institute of Fundamental Research, Mumbai India, January 1999
8. *Peering into the Sun*, Carnegie Institute of Washington, Washington DC, October 1999
9. *Peering into the Sun*, Massachusetts Institute of Technology, Boston MA, November 1999

10. *Peering into the Sun*, Ohio State University, Columbus OH, March 2000
11. *Probing the heart of the Sun*, Wesleyan University, Middletown CT, November 2000
12. *Temporal variations of solar structure and dynamics*, Tata Institute of Fundamental Research, Mumbai India, March 2001
13. *Helioseismology and the Solar Neutrino Problem*, Yale Center for Astronomy and Astrophysics, February 2002
14. *Solar Cycle Related Changes in the Sun*, University of Arizona, April 2002
15. *What has Helioseismology Revealed about the Solar Cycle?* Tata Institute of Fundamental Research, Mumbai India, December 2002
16. *Peering into the Sun*, University of Southern California, Los Angeles, February 2003
17. *Helioseismology and Solar Variability*, Carnegie Institute of Washington, Washington DC, May 2003
18. *What have we learned about the solar cycle using helioseismology?* Rutgers University, New Brunswick NJ, October 2003
19. *Some recent results in helio- and asteroseismology*, University of Rochester, Rochester, N.Y., April 2005
20. *Some recent results in helio- and asteroseismology*, University of Massachusetts, Amherst, M.A., May 2005
21. *Seismology of the Sun and Stars*, Dartmouth College, Hanover N.H., March 2006
22. *Trouble in Paradise: A tale of solar abundances*, Yale University, New Haven, CT, September 2006
23. *Journey to the Centre of the Sun*, Columbia University, New York, NY, October 2006
24. *Trouble in paradise: A tale of solar abundances*, California Institute of Technology, Pasadena, CA, November 2006
25. *So what's the matter with solar abundances?* Institute for Advanced Study, Princeton, N.J., March 2008
26. *Peering into the heart of the Sun: What have we learned during solar cycle 23?* Beijing Normal University, Beijing, China, October 2008
27. *The problem with solar abundances: Do we have the solution yet?* National Astronomical Observatories Headquarters, Beijing, China, October 2008
28. *What have we learned during solar cycle 23?* Yunnan Observatory, Kunming, China, October 2008
29. *Journeying to the centre of the Sun*, University of Montreal, Montreal, Canada, November 2008
30. *The Seismic Study of the Sun and Other Stars*, Max Planck Institute for Solar System Physics, Germany, May 2009
31. *Interpreting Helio- and Asteroseismic Data*, University of Birmingham, Birmingham, U.K., June 2009
32. *The Journey to the Centre of Stars with Kepler*, Wesleyan University, Middletown, CT, November 2011
33. *A Journey to the Centre of Stars*, 'Science Today' Lecture, State University of New York, Oswego, NY, February 2012
34. *What the Sun has taught us about basic properties of matter?* Plasma Physics Laboratory, Princeton University, Princeton, NJ March 2012
35. *How Asteroseismology is Challenging Stellar Astrophysics?* Institute for Advanced Study, Princeton, NJ, December 2013
36. *Oh that Wretched Surface Term!* Max-Planck Institute for Solar System Research, Göttingen, Germany, March 2014
37. *What We Saw in the Deep Solar Minimum and Beyond?* Max-Planck Institute for Solar System Research, Göttingen, Germany, March 2014
38. *Asteroseismology: Methods and Issues*, Beijing Normal University, Beijing, China, September 2014
39. *Asteroseismology: Some Results*, Beijing Normal University, Beijing, China, September 2014

40. *Solar Cycle Related Changes in the Sun*, Beijing Normal University, Beijing, China, September 2014
41. *Journeying to the centre of stars*, New York University, May 2015
42. *Investigating the heart of a star*, Indian Institute for Astrophysics, Bangalore, India, December 2015
43. *How to peek inside a star*, Florida State University, January 2016
44. *How to Peek Inside a Star*, Boston University, February 2017
45. *How to peer into the hearts of stars*, AURA Member Representatives Meeting, Tucson, AZ, May 2018
46. *Peering into Stars*, Yale University, September, 2018
47. *The changing Sun*, MIT, March 2019
48. *The deep-seated roots of solar variability*, University of Leicester, UK, June 2019
49. *Learning physics through Astronomy: The Sun and stars as laboratories*, Weizmann Institute, Rehovot, Israel, March 2020 (cancelled due to COVID-19)
50. *The hidden lives of stars*, Weizmann Institute, Rehovot, Israel, March 2020 (cancelled due to COVID-19)
51. *The hidden lives of stars*, Hebrew University, Jerusalem, Israel, March 2020, (cancelled due to COVID-19)
52. *Learning physics through Astronomy: The Sun and stars as laboratories*, TIFR Mumbai, India, October 2020 (virtual)
53. *The Sun in Time*, Leibniz Inst. for Astrophysics, Potsdam, Germany, November 2020 (virtual)
54. *Mysteries of the Sun*, Pabna University, Bangladesh, January 2021 (virtual)
55. *The Sun in Time and Other Mysteries*, Center for Computational Astrophysics, New York, January 2021 (virtual)
56. “*Do We Know What the Sun is Made of? The Puzzle of the Solar Composition*,” Game Changers Series, International Space Science Inst., Bern, Switzerland, June 202 (Virtual)
57. “*The Sun in Time: Two Solar Cycles of Change*,” Aarhus University, Denmark, September 2021 (virtual)
58. “*The Sun in Time: Two Solar Cycles of Change*,” University of Texas, Austin, October 2021 (virtual)
59. “*What is the Composition of the Sun?*” Indiana University, April 2022 (virtual)
60. “*Learning Physics through Astronomy: The Sun and Stars as Laboratories*,” Heidelberg Institute for Theoretical Studies, October 2022
61. “*The Sun as a Variable Star*,” Joint colloquium of Heidelberg University, Max-Planck Institute for Astronomy and the Heidelberg Institute for Theoretical Studies, Heidelberg October 2022
62. “*The Sun as a Benchmark*,” Joint colloquium of the Max-Planck Inst. for Astrophysics, the Max-Planck Institute for Extraterrestrial Physics, and the European Southern Observatory, Garching bei Munich, November 2022
63. “*The Sun in Time: Two Solar Cycles of Change*,” University of Texas, Austin, October 2023 (virtual)
64. “*A Journey to the Center of Stars*,” Colloquium given for organization “Cosmology and Astronomy Researchers of Indian Nationality and Sisters”, February 2024 (virtual)
65. “What do we know about our star?”, seminar at the State University of New York, Oswego, April 2024
66. “*Temporal Variations of the Tachocline*,” seminar for the NASA funded COFFIES Drive Center, November 2024 (virtual)

Invited talks in conferences:

1. *Determining Solar Structure from Oscillation Frequencies*, Joint Discussion Group 3, XXII IAU General Assembly Meeting, The Hague, Netherlands, August 1994.
2. *The Seismic Sun*, IAU Symposium 181: Sounding Solar and Stellar Interiors, Nice, France,

October 1996.

3. *Helioseismic Inversions: massive data sets and the determination of Solar Structure*, “Massive Data Sets” session, Joint Mathematics Meetings of the American Mathematical Society, San Diego, January 1997
4. *Inverse Problems in Helioseismology*, “Astrophysics & Algorithms: A DIMACS Workshop on Massive Astronomical Data Sets”, Princeton, May 1997
5. *The Seismic Sun* (award lecture), 19th meeting of the Astronomical Society of India, Bangalore, February 1999
6. *Solar Differential Rotation*, “Astrophysical Turbulence,” Santa Barbara, May 2000
7. *Solar Structure Inversions: Some Recent Results*, “XIth IRIS and LOWL/ECHO Workshop: Prospects for Ground Based Helioseismology at Low Degree,” Boulder CO, June 2000
8. *Helioseismically Deduced Solar Cycle Related Changes in the Sun*, “1st Joint Scientific Assembly of IAGA-IASPEI”, Hanoi, Vietnam, August 2001
9. *What does helioseismology tell us about structural changes with the solar cycle?* SOHO11 symposium, “From Solar Min to Max: Half a solar cycle with SOHO,” Davos, Switzerland, March 2002.
10. *Changes in the Sun: 1995 to 2001*, Spring Meeting of the American Geophysical Union, Washington DC, May-June 2002
11. *Stellar Inversions*, “Asteroseismology across the HR diagram.” Conference in Porto, Portugal July 2002
12. *Helioseismic estimates of the latitudinal dependence of solar structure and dynamics*, “3D stellar Evolution.” Workshop held at the Dept. of Applied Science, UC Davis, Livermore, CA, July 2002.
13. *Effect of Asymmetry on Ring-Diagram mode Parameters*, “Local Helioseismology Comparison Workshop,” National Solar Observatory, Tucson, AZ, March 2003.
14. *What does the Sun Teach us about Properties of Matter* (Parker Lecture), Solar Physics Division Meeting, Laurel MD, June 2003
15. *Rings diagrams: strengths and uncertainties*, “Local Helioseismology Comparison Workshop,” JILA, University of Colorado, Boulder CO, July 2003
16. *Helioseismic evidence of mixing in the Sun*, “Chemical Abundances and Mixing in Stars in the Milky Way and its Satellites,” ESO-Arcetri Workshop, Italy, September 2004
17. *Studying Stellar Evolution with (Helio)Seismology* (Plenary Talk), American Astronomical Society Meeting 207, Washington. D.C., January 2006.
18. *Interpreting solar frequencies: Methods and techniques*, “SOHO 17: 10 Years of SOHO and Beyond,” Giardini Naxos, Italy, May 2006.
19. *What has helioseismology taught us about the Sun?* “Cool Stars 14,” Pasadena, CA, November 2006
20. *Are Inputs to Standard Solar Models Correct?* American Astronomical Society Meeting 210, Honolulu, HI, May 2007
21. *Helioseismic evidence of changes inside the Sun*, Forum on Solar Influence on Climate, New Haven, CT, March 2008
22. *The solar metallicity problem: Do we have the solution?* “GONG 2008/SOHO XXI: Solar-stellar dynamos as revealed by helio- and asteroseismology,” Boulder, CO, August 2008
23. *The problem with solar abundances: Do we have the solution yet?* Workshop on Variable Stars, Beijing, China, November 2008
24. *Helioseismology as a diagnostic of the solar interior*, “HELAS: Synergies between solar and stellar modelling,” Rome, Italy, June 2009
25. *Changes in solar structure and rotation during solar cycle 23*, Joint Discussion 11: “New Advances in Helio- and Astero-Seismology,” IAU General Assembly, Rio de Janeiro, Brazil, August 2009
26. *Oscillations in Clusters: Report on KASC Working Group # 2*, 3rd Kepler Asteroseismology Workshop, “Kepler Asteroseismology in Action”, Aarhus, Denmark, June 2010

27. *GONG 2010 - SOHO 24: A summary of the conference*, GONG 2010 - SOHO 24: A new era of seismology of the Sun and solar-like stars, Aix-en-Provence, France, July 2010
28. *The issue of solar abundances*, “The power of helio- and asteroseismology”, Aarhus, Denmark, October 2010
29. *Asteroseismology*, Princeton Center for Theoretical Science program ‘Seismology of the Earth and Stars’, May 2011
30. *The structure of the solar tachocline*, Princeton Center for Theoretical Science program ‘Differential Rotation in Stars’, May 2011
31. *Why we need SONG*, 4th SONG workshop, College of Charleston, Charleston, SC, September 2011
32. *Helioseismology and the early solar luminosity*, Workshop “The Faint Early Sun: Problem, Paradox or Distraction?” STScI, Baltimore, MD, April 2012.
33. *Confronting stellar structure theory with asteroseismic data*, 9th HEDLA conference, Florida State University, Tallahassee, FL, May 2012
34. *Ensemble Asteroseismology: How Kepler is changing stellar astrophysics*, Kepler meeting-in-a-meeting, 220th meeting of the American Astronomical Society, Anchorage, AK, June 2012
35. *Helioseismic Inferences about the Sun’s Internal Abundances and Equation of State*, Workshop on Helioseismology held at the International Space Science Institute, Bern, Switzerland, Bern, Switzerland, September 2012
36. *Using Kepler to Constrain Nuclear Reactions*, Nuclear Astrophysics Town Hall meeting, Detroit, October 2012
37. *The peculiar solar cycle where do we stand?*, (Keynote lecture), “Eclipse on the Coral Sea – Cycle 24 ascending”, Palm Cove, Queensland, Australia, November 2012
38. *Helio- and Asteroseismology* (keynote address), “Advances in seismology of the Sun and stars,” Mumbai, India, December 2015
39. *Some thoughts about analyzing clusters*, “PLATO2.0: Coordination of the Stellar-Properties work packages,” University of Porto, Portugal, March 2015
40. *Determining seismic properties with asteroseismic data*, “Space Asteroseismology: the next generation,” University of Aarhus, Denmark, June 2015
41. *Seismic inferences of solar and stellar structure*, “The Sun, the stars, and the solar-stellar connection,” Kippenhauer Institute, Freiburg, Germany, September 2015
42. *Helioseismic tests of the equation of state*, Focus Meeting 17 of the General Assembly of the International Astronomical Union, Honolulu, August 2015
43. *Using the Sun as a laboratory to test physics*, Conference in honour of Phil Scherrer’s 70th birthday, Santa Cruz, CA, August 2016
44. *What helioseismology has taught us about opacities and EOS*, Workshop on Astrophysical Opacities, Kalamazoo, MI, August 2017
45. *A helioseismic perspective of solar-cycle related changes in the Sun: Evidence and unsolved issues*, Workshop in honour of Arnab Rai Chaudhuri’s 60th birthday, Jaipur, India, February 2018
46. *Large-scale flows in the Sun: Characteristics and variations*, IAU Symposium 340, Jaipur, India, 2018
47. *An Amazing Journey to the Center of the Sun* (award lecture), the Triennial Earth-Sun Summit, Leesburg VA, 2018
48. *Amazing Journeys to the Hearts of Stars* (Award Lecture), 232nd meeting of the American Astronomical Society, Denver, CO 2018, June 2018
49. *Asteroseismology of solar-like stars with Kepler and K2 (or a celebration of Kepler!)*, “First Light in a new Era of Astrophysics”, the TASC4/Kepler11 conference, Aarhus, Denmark, July 2018
50. *Some Issues in Stellar Modelling*, Division G meeting, XXXth meeting of the IAU General Assembly, Vienna, Austria, August 2018
51. *Uncovering the hidden layers of the Sun*, in *Dynamics of the Sun and Stars: Workshop in honor of the life and work of Michael Thompson*, Boulder, CO, September 2019

52. “Changes in the Sun: Results and Puzzles,” SDO 2021 Science Workshop: Celebrate a Solar Cycle of SDO Science, March 2021 (virtual)
53. “*Unanswered Questions for the Next Decades*”, Heliophysics 2050 Workshop, May 2021 (virtual)
54. “*What Two Solar Cycles Have Taught Us About Changes in the Solar Interior*, IAGA session on “Advances and Upcoming Developments in Solar and Heliospheric Physics”, August 2021 (virtual)
55. “*The Tachocline: a little of what we know, and what we do not know about it*,” COFFIES workshop, April 2022 (virtual)
56. “*Asphericity at the base of the convection zone*,” 2023 meeting of the Solar Physics Division of the American Astronomical Society, Minneapolis, MN (2023)
57. “*TASC8/KASC15: A very personal overview*,” 2024, 8th TESS/15th Kepler Asteroseismic Science Consortium Workshop, Porto, Portugal

Contributed talks in conferences:

1. *The Effect of Stellar Multiplicities on the IMF and Global Star Formation Rates*, “Star Formation, Galaxies and the Interstellar Medium,” Marciana Marina, Elba, Italy, May 1992
2. *Inversion of Combined and Homogeneous Data Sets*, Working Group 9 (Internal Structure and Inversion), 4th SOHO Workshop on Helioseismology, Pacific Grove, California, USA, April 1995.
3. *Helium Abundance in the Solar Envelope*, Working Group 11 (Frequencies of High Degree Solar Oscillations) 4th SOHO Workshop on Helioseismology, Pacific Grove, California, USA, April 1995.
4. *Solar Structure as Revealed by 1 Year LOWL Data*, “Windows Windows on the Sun’s Interior,” India, October 1995
5. *Solar Cycle Variation of Large Scale Flows in the Solar Interior*, “Helioseismic diagnostics of solar activity,” Stanford, July 1999
6. *Studying Asphericity in the Solar Sound Speed*, “SOHO 10/GONG 2000 Workshop: Helio- and Asteroseismology at the dawn of the millennium” Tenerife, Spain, October 2000.
7. *Ring Diagram Analysis of the Characteristics of Solar Oscillation Modes in Active Regions*, “Local-area Helioseismology”, workshop held at Stanford Univ., Palo Alto, CA, April 2001.
8. *Ring Diagram Analysis of the Structure of Solar Active Regions*, “Local-area Helioseismology Comparisons,” workshop held at the National Solar Observatory, Tucson, AZ, February 2004.
9. *Differences between the current solar minimum and those of cycles 23 and 22*, “SOHO 23: Understanding a Peculiar Solar Minimum,” Northeast Harbor, ME, September 2009
10. *Are recent solar heavy element abundances consistent with helioseismology?*, GONG 2010 - SOHO 24: A new era of seismology of the Sun and solar-like stars, Aix-en-Provence, France, July 2010
11. *How different was the last solar minimum?* The 61st Fujihara Seminar “Progress in solar/stellar physics with helio- and asteroseismology,” Hakone, Japan, March 2011
12. *Outreach Efforts with my CAREER Grant: Working with K-12 Teachers*, American Geophysical Union Meeting, San Francisco, December 2011
13. *Asteroseismic Modelling of Kepler Stars*, *Kepler Science Meeting*, NASA AMES, December 2011
14. *Comparing the Internal Structure of the Sun during the Cycle 23 and Cycle 24 Minima*, AGU Chapman Conference on Causes and Consequences of the Extended Solar Minimum Between Solar Cycles 23 and 24, Key Largo, Florida, April 2013
15. *Flows in the polar regions of the Sun: Limits of observing from the Ecliptic*, AGU Fall meeting, December 2020 (virtual)
16. *(Near) Polar Flows: What do we know now?* NASA funded COFFIES Drive Center, June 2024 (virtual)

Public Lectures:

1. *Solar Variability and How it Affects Us*, Yale New Haven Teachers' Institute, New Haven, CT, April 2004
2. *Astronomy and Astrophysics Today*, Timothy Dwight College, Yale University, New Haven CT, February 2005
3. *A journey to the centre of the Sun*, Astronomical Society of New Haven, June, 2007
4. *Peering into the heart of the Sun*, Westport Astronomical Society, Westport, CT, April 2008
5. *Of planets and stars: missions to find distant planets*, Astronomical Society of New Haven, August 2009
6. *A Journey to the Centre of the Sun*, Yale Society of Physics Students, New Haven, CT, USA, February 2010
7. *Studying the Sun*, Peabody Fellows Summer Solar Science Program, New haven, CT, August 2011
8. *The Solar Cycle*, talk given at Peabody Museum, Yale for CT grade 5-8 teachers, November 2012
9. *Studying the Sun*, talk given at Peabody Museum, Yale for CT grade 8 teachers, August 2013
10. *Solar and Stellar Astrophysics Today: Questions and Techniques*, Taft School, CT, Jan 2017
11. *Listening to the Stars*, Greenwich Observatory, Greenwich CT, May 2017
12. *Solar Eclipses: The Dread and the Fascination (and the Science)*, University of South Carolina, August 2017
13. *Journey to the center of the Sun*, Stewart Observatory, Tucson. AZ, May 2018
14. *"Hearing" the structure of the Sun*, Westport Astronomical Society, Westport, CT, April 2019
15. *"How does the Sun Affect Us?"* National Initiative of the Yale-New Haven Teachers Institute, July 2021 (virtual)
16. *"How does the Sun Affect Us?"*, Yale Class of '60 Tea, November 2021 (virtual)
17. *"Touching the Heart of the Sun,"* The Astronomy, Space Tech, Astrophysics and Cosmology club of BITS Pilani, India (virtual)
18. *"Living with a star"*, Vigyan Vidushi Bibha Chowdhuri Memorial Lecture, Tata Institute of Fundamental Research, India, July 2022 (virtual)
19. *"Alien Earths,"* Yale National Initiative, July 2023
20. *"A Journey to the Centre of the Earth,"* Whitney Center, Hamden, CT, April 2024
21. *"How well do we know our Star?"*, Solar Eclipse Celebration, State University of New York, Oswego, April 2024