

WERNER DÄPPEN

Personal:

Date of Birth: September 9, 1950
Place of Birth: Zürich, Switzerland
Citizenship: United States of America & Switzerland

Education:

Diploma, ETH Zürich, 1975 (Physics)
Dr. Sc. Nat., ETH Zürich, 1978 (Theoretical Physics)

Academic Appointments:

Professor Emeritus	University of Southern California	2017-
Professor	University of Southern California	1998-2017
Department Chair	Department of Physics and Astronomy	2006-2012
Associate Professor	University of Southern California	1991-1998
Visiting Professor	Universität Hamburg (Germany)	2012-2013
Visiting Professor	Jacobs University Bremen (Germany)	2005-2006
Visiting Professor	Universität Wien (Austria)	1991-1992
Visiting Scientist	European Space Agency (The Netherlands)	1988-1990
Visiting Scientist	CEA-Saclay (France)	1987-1988
Visiting Scientist	Observatoire de Paris-Meudon (France)	1986-1987
Visiting Scientist	High Altitude Observatory, Boulder (USA)	1984-1986
Research Fellow	Institute of Astronomy, Cambridge (UK)	1982-1984
Postdoctoral Fellow	Observatoire de Genève (Switzerland)	1978-1981

Graduate Students

a) Graduating with PhD [Year, Position (as of 2016)]

Alan Nayfonov (1998, R&D Engineer, Teradyne, Woodland Hills, CA)

Zhigang Gong (2001, VP of Marketing, US Office, O-Net Communication, China)

Chia-Hsien Lin (2003, Associate Professor, National Central University, Taiwan)

Aihua Liang (2005, Financial Analyst, Goldman-Sachs, New York)

Katie Mussack (2007, Staff Scientist, Los Alamos National Laboratory)

Dan Mao (2008, Postdoctoral Fellow, Renmin University of China, Beijing)

Hsiao-Hsuan Lin (2012, Physicist, Taiwan Semiconductor Manufacturing Company)

Yung-Ching Liang (2013, Physicist, Taiwan Semiconductor Manufacturing Company)

b) Other

Xiaomin Wang (SAP, San Mateo, CA)

Fan Yang (Unknown)

Ladislav Zejda (Returned to Czech Republic)

Zhunwei Zhao (Left for Stanford University to graduate with PhD, 2005)

Research Fields:

Atomic physics (X-ray emission in ion-atom collisions); Stellar structure and evolution; Thermodynamics of stellar interiors; Solar and stellar oscillations; Long-term variations of the Sun; Solar neutrino problem (WIMPs); Lithium abundance in open cluster stars; Helioseismic diagnosis of the equation of state; Theory of reacting hot dense Coulomb plasmas; Molecular-dynamics simulations of stellar fusion.

Awards & Honorary Memberships:

Member, International Astronomical Union (1979-)
Overseas Fellow, Churchill College, Cambridge, UK (1999-)
General Education Teaching Award, College of Letters Arts and Sciences, USC (2000)
"Faculty of the Month" Award, Mortar Board, USC (2001)
Golden Key International Honor Society (2004-)
USC Associates Award for Excellence in Teaching (2004)
General Education Teaching Award, College of Letters Arts and Sciences
for Distinguished Service to the General Education Program, USC (2007)

Conference Organizing

GONG 94 Helio- and Asteroseismology from Earth and Space, USC, 1994 (Organizer)
XXII IAU General Assembly (Joint Discussion 3), The Hague, 1994 (Convener)
Equation of State in Astrophysics, Lorentz Center, Leiden, 2004 (Organizer),
Progress in Electromagnetics Research Symposium (PIERS), Beijing, China, 2007 (Convener)
The Art of Modelling Stars in the 21st Century, Sanya, China, 2008 (Member, SOC)
Synergies between solar and stellar modelling, Rome, Italy, 2009 (Member, SOC)
9th Annual Theoretical Astrophysics in Southern California (TASC), USC, 2009 (Organizer)
8th High Energy Density Laboratory Astrophysics, Caltech, 2010 (Member, SOC)
9th High Energy Density Laboratory Astrophysics, FSU, 2012 (Member, SOC)
10th High Energy Density Laboratory Astrophysics, Bordeaux, France, 2014 (Member, SOC)

PUBLICATIONS

1. Wölfli, W., Stoller, Ch., Bonani, G., Stöckli, M., Suter, M. & Däppen, W. 1976, [Periodic anisotropy fluctuations in quasimolecular X-ray emission], *Phys. Rev. Letters*, **36**, 309-312.
2. Däppen, W. & W. Baltensperger 1977, [X-ray transitions in heavy-ion collisions induced by the nuclear charges], *Journal of Physics B: Atom. Molec. Phys.*, **10**, 1309-1319.
3. Däppen, W. 1977, [An exactly solvable model for ionization and charge transfer in ion-atom collisions], *Journal of Physics B: Atom. Molec. Phys.*, **10**, 2399-2406.
4. Wölfli, W., Stoller, Ch., Bonani, G., Stöckli, M., Suter, M. & Däppen, W. 1978, [Evidence for a molecular REC-effect in heavy-ion collisions] *Zeitschrift für Physik*, **A286**, 249-252.
5. Däppen, W. 1978, [Modelle für die molekulare Röntgenstrahlung in Schwerionenkollisionen], *Thesis*, (ETH-Zürich, Diss. Nr. 6091)
6. Däppen, W. 1980, [An analytical version of the free-energy-minimization method for the equation of state of stellar plasmas], *Astron. Astrophys.*, **91**, 212-220.
7. Däppen, W. 1980, [Starke Sternwinde (semipopular article in German)], *Neue Zürcher Zeitung*, **258**, 75.
8. Däppen, W. 1983, [Hydrostatic reaction of the Sun to local disturbances], *Astron. Astrophys.*, **124**, 11-22.
9. Cayrel, R., Cayrel, G., Campbell, B. & Däppen, W. 1984, [The lithium abundance of Hyades main-sequence stars], *Astrophys. J.*, **283**, 205-208.
10. Däppen, W. & Perdang, J. 1984, [Solar oscillations: the challenge of nonlinearity], *Mem. Soc. astr. Italiana*, **55**, 299-304.
11. Däppen W. & Gough, D.O. 1984, [On the determination of the helium abundance of the solar convection zone], in *Theoretical Problems in Stellar Oscillations and Stability*, (eds. M. Gabriel and A. Noels, Institut d'Astrophysique, Liège), 264-269.
12. Däppen, W. & Perdang, J. 1985, [Nonlinear adiabatic stellar oscillations. Nonradial mode interactions], *Astron. Astrophys.*, **151**, 174-188.
13. Däppen W. & Perdang, J. 1985, [Nonlinear nonradial adiabatic stellar oscillations: numerical results for many-mode couplings], in *Chaos in Astrophysics*, (eds. J.R.Buchler, J.Perdang, and E.A. Spiegel, Reidel, Dordrecht), 273-284.
14. Däppen, W., Gilliland, R.L. & Christensen-Dalsgaard, J. 1986, [WIMPs, solar neutrinos, and solar oscillations], *Nature*, **321**, 229-231.
15. Däppen W. & Gough, D.O. 1986, [Progress report on the helium abundance determination], in *Seismology of the Sun and the distant stars*, (ed. D.O. Gough, Reidel, Dordrecht), 275-280.

16. Däppen, W., Dziembowski, W.A., Sienkiewicz, R. 1987, [Asteroseismology: results and prospects], in *Advances in helio- and asteroseismology* (ed. J. Christensen-Dalsgaard, IAU-Symp. 123, Reidel, Dordrecht), 233-247.
17. Däppen, W. 1987, [Theoretical constraints from high S/N high resolution spectroscopy], in *The impact of high S/N high resolution spectroscopy* (ed. G. Cayrel de Strobel, IAU-Symp. 132, Reidel, Dordrecht), 211-215.
18. Däppen, W., Anderson, L.S. & Mihalas, D.M. 1987, [Statistical mechanics of partially ionized stellar plasmas: the Planck- Larkin partition function, polarization shifts, and simulations of optical spectra], *Astrophys. J.*, **319**, 195-206.
19. Gilliland R.L. & Däppen, W. 1987, [Hypercharge, solar structure, and stellar evolution], *Astrophys. J.*, **313**, 429-431.
20. Gilliland, R.L. & Däppen, W. 1987, [Oscillations in solar models with WIMPs], *Astrophys. J.*, **324**, 1153-1157.
21. Däppen, W. 1987, [Solar oscillations and the equation of state], in *Strongly coupled plasma physics*, (eds. F. Rogers and H. DeWitt, NATO-ASI Ser., Plenum, New York), 179-182.
22. Soderblom, D. & Däppen, W. 1987, [Seismological constraints on ϵ Eridani], in *Proc. IAU Symp. 123: Advances in helio- and asteroseismology*, (ed. J. Christensen-Dalsgaard, Reidel, Dordrecht) (1987), 281-284.
23. Mihalas, D.M., Däppen, W. & Hummer, D.G. 1988, [The equation of state for stellar envelopes: II. Algorithm and selected results], *Astrophys. J.*, **331**, 815-825.
24. Däppen, W., Mihalas, D.M. & Hummer, D.G. 1988, [The equation of state for stellar envelopes: III. Thermodynamic quantities], *Astrophys. J.*, **332**, 261-270.
25. Christensen-Dalsgaard, J., Däppen, W. & Lebreton, Y. 1988, [Solar oscillation frequencies and the equation of state], *Nature*, **336**, 634-638.
26. Däppen, W. 1988, [Current options for the equation of state of the solar interior], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 451-456.
27. Däppen W. & Soderblom, D. 1988, [Epsilon Eridani revisited], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 653-655.
28. Däppen, W., Gough, D.O. & Turck-Chièze, S. 1988, [Modeling solar p-mode oscillation frequencies], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 511-512.
29. Däppen, W., Gough, D.O. & Thompson, M.J. 1988, [Further progress on the helium abundance determination], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 505-510.
30. Turck-Chièze, S., Däppen, W. & Cassé, M. 1988, [High mass loss in the young Sun!], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 629-635.

31. Lebreton, Y. & Däppen, W. 1988, [The influence of the equation of state on the zero-age main sequence and the Sun], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 661-664.
32. Belmonte, J.A., Chevreton, M., Mangeney, A., Saint-Pé, O., Puget, P., Praderie, F., Däppen, W., Alvarez, M., Fuensalida, J. & Roca Cortés, T. 1988, [Rapid photometry of the δ Scuti variable 63 Her], in *Seismology of the Sun and sun-like stars*, (ed. E. Rolfe, ESA SP-286), 551-555.
33. Soderblom, D. & Däppen, W. 1989, [Modeling the global oscillations of ϵ Eridani], *Astrophys. J.*, **342**, 945-950.
34. Zweibel, E. & Däppen, W. 1989, [The effect of fibril magnetic fields on solar oscillations], *Astrophys. J.*, **343**, 994-1003.
35. Däppen, W. 1989, [Stellar Seismology], in *Inside the Sun* (eds. G. Berthomieu and M. Cribier, IAU Colloquium 121), 357-370.
36. Däppen, W. 1990, [The internal rotation of the Sun], in *Frontiers in stellar evolution theory*, (ed. M.-J. Goupil, Springer Lecture Notes Series 366), 69-86.
37. Mihalas, D.M., Hummer, D.G., Mihalas, B.W. & Däppen, W. 1990, [The equation of state for stellar envelopes: IV. Thermodynamic quantities and selected ionization fractions for six elemental mixtures], *Astrophys. J.*, **350**, 300-308.
38. Däppen, W., Lebreton, Y. & Rogers, F. 1990, [The equation of state of the solar interior: a comparison of results from two competing formalisms], *Solar Physics*, **128**, 35-47.
39. Däppen, W. 1990, [Progress Towards a Unified Equation of State], in *Progress of Seismology of the Sun and Stars*, (eds. Y. Osaki and H. Shibahashi, Springer Lecture Notes Series 367), 33-40.
40. Däppen, W., Keady, J. & Rogers, F. 1991, [Equation of state and opacity, *invited chapter*], in *The solar interior and atmosphere* (eds. A. Cox, W. Livingston and M. Matthews, Space Science Series, University of Arizona Press, Tucson AZ), 112-139.
41. Däppen, W. 1991, [Probing the Solar interior], *Adv. Space Res.*, **11**, 5-14.
42. Mangeney, A., Däppen, W., Praderie, F. & Belmonte, J.A. 1991, [A theoretical interpretation of the δ Scuti-like pulsation of the star 63 Her] *Astronomy and Astrophysics*, **244**, 351.
43. Schrijver, C.J., Jiménez, A. & Däppen, W. 1991, [Observations of the phase differences between irradiances and velocity for low-degree solar acoustic modes] *Astronomy and Astrophysics*, **251**, 655-668.
44. Pamyatnykh, A.A., Vorontsov, S.V. & Däppen, W. 1991, [A calibration of solar envelope models using the frequencies of intermediate-degree solar acoustic oscillations], *Astronomy and Astrophysics*, **248**, 263-269.

45. Däppen, W., Gough, D.O., Kosovichev, A.G. & Thompson, M.J. 1991, [A new inversion for the hydrostatic stratification of the Sun], in *Challenges to Theories of the Structure of Moderate-Mass Stars*, (eds. D. Gough and J. Toomre, Springer Lecture Notes Series 388), 111-120.
46. Däppen, W. 1992, [The equation of state for stellar envelopes: comparison of results from different formalisms], *Revista Mexicana Astronomica y Astrofísica*, **23**, 141-149.
47. Kosovichev, A.G., Christensen-Dalsgaard, J. & Däppen, W., Dziembowski, W.A., Gough, D.O. & Thompson, M.J. 1992, [Sources of uncertainty in direct seismological measurements of the solar helium abundance], *Mon. Not. R. astr. Soc.*, **259**, 536-558.
48. Christensen-Dalsgaard, J. & Däppen, W. 1992, [Solar oscillations and the equation of state], *Astronomy and Astrophysics Review*, **4**, 267-361.
49. Turck-Chièze, S., Däppen, W., Fossat, E., Provost, J., Schatzman, E. & Vignaud, D. 1992, [The solar interior], *Physics Report*, **230**, 57-235.
50. Däppen, W. 1992, [The equation of state for stellar envelopes], in *Physics of Nonideal Plasmas*, (eds. W. Ebeling, A. Förster & R. Radtke, Teubner Texte zur Physik 26, Teubner, Germany), 278 - 285.
51. Däppen, W. 1993, [The equation of state], in *Proc. IAU Symposium No 137: Inside the Stars*, (eds. W. Weiss and A. Baglin, PASP Conference Series Vol. 40), 208-221.
52. Däppen, W. 1993, [Theory of δ Scuti stars], in *GONG 1992: Seismic Investigations of the Sun and Stars*, (ed. T. Brown, PASP Conference Series), 317-330.
53. Däppen, W., Gough, D.O., Kosovichev, A.G. & Rhodes, E.J., Jr 1993, [On the influence of the treatment of heavy elements in the equation of state on the resulting values of the adiabatic exponent Γ_1], in *Proc. IAU Symposium No 137: Inside the Stars*, (eds. W. Weiss and A. Baglin, PASP Conference Series Vol. 40), 304-306.
54. Däppen, W. 1993, [The heavy-element contribution to the equation of state of the solar interior: the diagnostic potential of helioseismology], in *Physics of Strongly-Coupled Plasmas*, (ed. H.M. Van Horn, University of Rochester).
55. Rhodes, E.J., Jr., Cacciani, A., Däppen, W., Didkovsky, L., Hill, F., Korzennik, S.G., Kosovichev, A.G., Kotov, V.A. & Scherrer, P.H. 1993, [Plans for Mt. Wilson-Crimean Observatory high-degree helioseismology network], in *GONG 1992: Seismic Investigations of the Sun and Stars*, (ed. T. Brown, PASP Conference Series), 477-480.
56. Däppen, W. 1994, [Helioseismology: the Sun as a strongly-constrained, weakly-coupled plasma], in *Proc. IAU Colloquium 147: the equation of state in astrophysics*, (eds. G. Chabrier & E. Schatzman, Cambridge University Press), 368-393.
57. Vorontsov, S.V, Baturin, V.A., Gough, D.O. & Däppen, W. 1994, [Towards a helioseismic calibration of the equation of state of the plasma in the solar convective envelope], in *Proc. IAU Colloquium 147: the equation of state in astrophysics*, (eds. G. Chabrier & E. Schatzman, Cambridge University Press), 545-549.

58. Däppen, W. 1994, [Astero-seismologie: muziek van de sterren (in Dutch)], *Zenit* (Dutch popular astronomy magazine), 346-347
59. Däppen, W. 1994, [Proceedings of the Joint Discussion 3 of the XXII General Assembly of the IAU], in *Highlights of Astronomy*, **10**, 319-348.
60. Däppen, W. 1994, [Equation of state issues in helioseismology], in *Elementary Processes in Dense Plasmas*, (eds. S. Ichimaru and S. Ogata, Addison Pub. Co.), 215-224.
61. Fröhlich, C., Romero, J., Roth, H., Wehrli, C., Andersen, B.N., Appourchaux, T., Domingo, V., Telljohann, U., Berthomieu, G., Delache, P., Provost, J., Toutain, T., Crommelynck, D.A., Chevallier, A., Däppen, W., Gough, D.O., Hoeksema, T., Jiménez, A., Roca Cortés, T., Herreros, J.M., Jones, A.R., Pap J.M., & Willson, R.C. 1995, [VIRGO: Experiment for helioseismology and solar irradiance monitoring], *Solar Physics*, **162**, 101-128.
62. Reiter, J., Rhodes, E.J., Jr., Däppen, W. & Korzennik, S.G. 1995, [Applications of massively-parallel computing in solar modeling], in *GONG 1994: Helio- and Astero-seismology from Earth and Space*, (eds. R.K. Ulrich, E.J. Rhodes & W. Däppen, PASP Conference Series), 140-143.
63. Däppen, W. 1995, [Solar Models and Oscillation Theory], in *Proc. of Fourth SOHO Workshop Helioseismology: Vol. 1*, (eds. V. Domingo et al ESA SP-376, ESTEC, Noordwijk), 19-29.
64. Däppen, W. & Nayfonov, A. 1995, [Some Aspects of Model Entropy Calculations for Stellar Plasmas], in *Proc. of Fourth SOHO Workshop Helioseismology: Vol. 2*, (eds. V. Domingo et al ESA SP-376, ESTEC, Noordwijk), 19-20.
65. Perez, A. & Däppen, W. 1995, [Rigorous constraints on the ionization of elements in the solar center], in *Proc. of Fourth SOHO Workshop Helioseismology*, (eds. V. Domingo et al ESA SP-376, ESTEC, Noordwijk), 15-18.
66. Baturin, V., Däppen, W., Wang, Xiao-Ming & Yang Fan 1995, [Nonideal effects in the solar equation of state], in *Proc. 32nd Liège International Astrophysical Colloquium: Stellar Evolution: What should be done*, (eds. M. Gabriel and A. Noels), 33-38.
67. Christensen-Dalsgaard, J., Däppen, W., & the GONG team 1996, [The Current State of Solar Modeling], *Science*, **272**, 1286-1292.
68. Däppen, W. 1996, [Helioseismic Diagnosis of the Equation of State], *Bull. Astron. Soc. India*, **24**, 151-160.
69. Däppen, W. 1996 [Observational constraints on the plasma of the solar interior], in *Proc. International Conference on the Physics of Strongly Coupled Plasmas*, (eds. W.-D. Kraeft & M. Schlages, World Scientific, Singapore), (*Note: by a clerical mistake, the paper was omitted in the proceedings; later it was supplied as an update.*).

70. Däppen, W. & Perez, A. 1997, [The current situation in the solar equation of state], in *Proc. IAU Symposium 181: Sounding Solar and Stellar Interiors*, (ed. G. Berthomieu), 81.
71. Arndt, S., Däppen, W. & Nayfonov, A. 1998, [On density and temperature-dependent ground-state and continuum effects in the equation of state for stellar interiors], *Astrophys. J.*, **498**, 349-359.
72. Nayfonov, A. & Däppen, W. 1998 [The signature of the internal partition function in thermodynamical quantities of the solar interior], *Astrophys. J.*, **499**, 489-495.
73. Gong Zhi-Gang, Däppen W. & Li Yan 1998, [Solar p-mode frequencies with updated atomic opacities], in *A half century of stellar pulsation interpretations: A Tribute to Arthur N. Cox*, (eds. P.A. Bradley & J.A. Guzik, ASP Conference Series Vol. 135), 266
74. Basu, S., Däppen, W. & Nayfonov, A. 1998, [Helioseismic signature of the presence of excited states in the adiabatic exponent], in: *Structure and Dynamics of the Interior of the Sun and Sun-like Stars*, eds. S.G. Korzennik & A. Wilson, ESA SP- 418, ESA Publications Division, Noordwijk: The Netherlands, 435-438.
75. Gong Zhi-Gang & Däppen W. 1998, [The influence of low-temperature opacity on solar models and p-mode frequencies], in: *Structure and Dynamics of the Interior of the Sun and Sun-like Stars*, eds. S.G. Korzennik & A. Wilson, ESA SP- 418, ESA Publications Division, Noordwijk: The Netherlands, 465-468.
76. Däppen W. 1998, [Helioseismic probing of fine effects in the equation of state], in: *Structure and Dynamics of the Interior of the Sun and Sun-like Stars*, eds. S.G. Korzennik & A. Wilson, ESA SP- 418, ESA Publications Division, Noordwijk: The Netherlands, 445-448.
77. Jones, A., Belkic, D., Däppen, W., Lin Chia-Hsien & Taylor, H. 1998, [Application of the filter diagonal spectral estimator in helioseismology], in: *Structure and Dynamics of the Interior of the Sun and Sun-like Stars*, eds. S.G. Korzennik & A. Wilson, ESA SP- 418, ESA Publications Division, Noordwijk: The Netherlands, 249-252.
78. Däppen, W. 1998, [Input physics: equation of state], *Space Science Reviews*, **85**, 49-60.
79. Gong Zhi-Gang, Däppen W. & Li Yan 1998, [The solar p-mode frequencies with OPAL and OP opacity], in: *The 10th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun*, (eds. B. Donahue & J. Bookbinder, ASP Conference Series Vol.154), 761-766.
80. Gong Zhi-Gang, Yuan Y.Q., Däppen W., Li Y. & Peng M.X. 1998, [Solar modeling and helioseismology in 1990's: I. Progress in solar structure], *Progress in Astronomy*, **16**, 287-304.
81. Gong Zhi-Gang, Yuan Y.Q., Li Y., Däppen W. & Peng M.X. 1998, [Solar modeling and helioseismology in 1990's: II. Progress in solar oscillations], *Progress in Astronomy*, **16**, 305-320.

82. Däppen, W., Nayfonov, A. 1998 [The Sun: Strong constraints on a weakly-coupled plasma], in *Strongly Coupled Coulomb Systems*, eds. G. Kalman, J.M. Rommel & K. Blagoev, Plenum), 327-330.
83. Charbonnel, C., Däppen, W., Bernasconi, P., Maeder, A., Meynet, G., Schaerer, D., & Mowlavi, N. 1999, [Grids of stellar models. VII. From 0.4 to 1.0 M_{\odot} at $Z=0.020$ and $Z=0.001$, with the MHD equation of state], *Astron. Astrophys. Suppl. Ser.*, **135**, 405-413.
84. Basu, S., Däppen, W. & Nayfonov, A. 1999 [Helioseismic analysis of the hydrogen partition function in the solar interior], *Astrophys. J.*, **518**, 985-993.
85. Kraeft, W.-D., Arndt, S., Däppen, W. & Nayfonov, A. 1999 [A comment on *On density and temperature-dependent ground-state and continuum effects in the equation of state for stellar interiors*] *Astrophys. J.*, **516**, 369-370.
86. Nayfonov, A., Däppen, W., Hummer, D.G. & Mihalas, D.M. 1999, [The MHD equation of state with post-Holtsmark microfield distributions], *Astrophys. J.*, **526**, 451-464.
87. Däppen, W. 2000, [Atoms and Molecules, *invited chapter*] in *Astrophysical Quantities, 4th Edition* (ed. A. Cox, American Institute of Physics), 27-51.
88. Christensen-Dalsgaard, J., Däppen, W., Dziembowski, W.A. & Guzik, J.A. 2000, [An introduction to helioseismology], in *Proc. Variable stars as important astrophysical tools* ed. C. Ibanoglu (NATO Advanced Study Institute, Çeşme, Turkey), (Kluwer), 59-167.
89. Däppen, W. & Guzik, J.A. 2000, [Astrophysical opacity and equation of state], in *Proc. Variable stars as important astrophysical tools* ed. C. Ibanoglu (NATO Advanced Study Institute, Çeşme, Turkey), (Kluwer), 177-212.
90. Däppen, W., Nayfonov, A. 2000 [The Sun as an equation-of-state laboratory], *Astrophys. J. Suppl.*, **127**, 287-292.
91. Baturin, V.A., Däppen, W., Gough D.O. & Vorontsov, S.V. 2000 [Seismology of the solar envelope: sound-speed gradient in the convection zone], *Mon. Not. R. astr. Soc.*, **316**, 71-83.
92. Lin, Chia-Hsien & Däppen, W. 2000, [Investigating the excitation of acoustic modes using homomorphic deconvolution], *Solar Physics*, **193**, 357-364.
93. Gong, Zhi-Gang & Däppen, W. 2000, [Upgrading the MHD Equation of State to Include Relativistic Electrons], in *The Impact of Large-scale Surveys on Pulsating Star Research*, (eds. L. Szabados & D.W. Kurtz, ASP Conference Series Vol. 203), 388-389.
94. Gong, Zhi-Gang, Däppen, W. & Zejda, L. 2000, [MHD Equation of State with Relativistic Electrons], *Astrophys. J.*, **546**, 1178.
95. Däppen, W. 2000, [Solar Interior: Equation of State and Opacity, *invited chapter*], in *Encyclopedia of Astronomy and Astrophysics*, (Institute of Physics).
96. Däppen, W. 2000, [Stellar Thermodynamics, *invited chapter*], in *Encyclopedia of Astronomy and Astrophysics*, (Institute of Physics).

97. Celebonovic, V. & Däppen, W. 2000, [The plasma-solid transition: two simple examples] in *Contributed papers of the 20th SPIG Conference*, (ed. Z.Lj.Petrovic, M.M.Kuraica, N.Bibic and G.Malovic), (Inst. of Physics, Faculty of Physics and INN. Vinca, Beograd, Yugoslavia), 527.
98. Houdek G., Chaplin W.J., Appourchaux T., Christensen-Dalsgaard J., Däppen W., Elsworth Y., Gough D.O., Isaak G.R., New R., & Rabello-Soares M.C. 2000, [Changes in convective properties over the solar cycle: effect effect on p-mode damping rates], *Mon. Not. R. astr. Soc.*, **327**, 483.
99. Lin, Chia-Hsien & Däppen, W. 2001, [Extracting the excitation function of solar oscillations by means of deconvolution], *Proc. SOHO 10/GONG 2000 Workshop*, (ESA SP-464, ESA Publications Division, Noordwijk: The Netherlands), 649.
100. Lin, Chia-Hsien & Däppen, W. 2001, [Inversion for the adiabatic gradient γ_1 to examine equation-of-state effects], *Proc. SOHO 10/GONG 2000 Workshop*, (ESA SP-464, ESA Publications Division, Noordwijk: The Netherlands), 527.
101. Gong, Zhi-Gang, Däppen, W. & Zejda, L. 2001 [MHD Equation of State with Relativistic Electrons], *Astrophys. J.*, **546**, 1178.
102. Däppen, W. 2001, [Thermodynamics from the Sun], *Contrib. Plasma Phys.*, **41**, 291-294.
103. Gong, Zhi-Gang, Zejda, L., Däppen, W. & Aparicio J.M. 2001 [Generalized Fermi-Dirac Functions and Derivatives: Properties and Evaluation], *Comp. Phys. Commun.*, **136**, 294-309.
104. Gong, Zhi-Gang, Däppen, W. & Nayfonov, A. 2001, [Effects of Heavy Elements and Excited States in the Equation of State of the Solar Interior], *Astrophys. J.*, **563**, 419-433.
105. Däppen, W. 2002, [Helioseismic Studies of Dense Plasmas], in *Inertial Fusion Science Applications 2001*, eds. K.A. Tanaka, D.D. Meyerhofer & J. Meyer-ter-Vehn (Elsevier, 2002), 946-951.
106. Celebonovic, V. & Däppen, W. 2002, [The plasma-solid transition:some implications in astrophysics], *Serb. Astron. J.*, **165**, 23-26.
107. Däppen, W. 2003, [Solar constraints on the equation of state], in *Astrophysical Fluid Dynamics*, eds. M.J. Thompson & J. Christensen-Dalsgaard (Cambridge University Press, 2003), 179-191.
108. Liang, A., & Däppen, W. 2003, [Modifications of the Equation of State to Achieve Desired Changes in Thermodynamic Quantities], in *Proceedings of SOHO 12 / GONG+ 2002. Local and Global Helioseismology: the Present and Future*, (ed. H. Sawaya-Lacoste, ESA SP-517, Noordwijk), 333-336.
109. Lin, C.-H., & Däppen, W. 2003, [Helioseismic Constraints on the Chemical Composition and the Equation of State], in *Proceedings of SOHO 12 / GONG+ 2002*.

Local and Global Helioseismology: the Present and Future, (ed. H. Sawaya-Lacoste, ESA SP-517, Noordwijk), 337-340.

110. Lin, C.-H., & Däppen, W. 2003, [Investigating Inversion Uncertainties Resulting from Mode Selections], in *Proceedings of SOHO 12 / GONG+ 2002. Local and Global Helioseismology: the Present and Future*, (ed. H. Sawaya-Lacoste, ESA SP-517, Noordwijk), 341-344.

111. Baturin, V.A. & Däppen, W. 2003, [Equation of State for the Internal Structure of Solar-Type Stars (translated from *Astronomicheskii Zhurnal*)], **80**, No. 8, 744-752], *Astronomy Reports*, **47**, No. 8, 685-693.

112. Däppen, W., 2004, [Equations of state for solar and stellar modeling], in *Equation-of-State and Phase-Transition Issues in Models of Ordinary Astrophysical Matter*, (eds. V. Celebonovic, W. Däppen & D. Gough, AIP Conference Proceedings 731, Melville, New York), 3.

113. Lin, C.-H. & Däppen, W. 2004, [Isolating the effects of chemical composition in the equation of state], in *Equation-of-State and Phase-Transition Issues in Models of Ordinary Astrophysical Matter*, (eds. V. Celebonovic, W. Däppen & D. Gough, AIP Conference Proceedings 731, Melville, New York), 219.

114. Lin, C.-H. & Däppen, W. 2004, [The chemical composition and equation of state of the Sun inferred from seismic models through an inversion procedure], in *Equation-of-State and Phase-Transition Issues in Models of Ordinary Astrophysical Matter*, (eds. V. Celebonovic, W. Däppen & D. Gough, AIP Conference Proceedings 731, Melville, New York), 230.

115. Däppen, W. 2004, [Phenomenological and rigorous equations of state for solar and stellar modeling], in *Helio- and Asteroseismology: Towards a Golden Future, Proc. SOHO 14/GONG 2004 Workshop*, (ed. D. Danesy, ESA SP-559, Noordwijk, The Netherlands), 261.

116. Liang, A. & Däppen, W. 2004, [Emulating the OPAL equation of state], in *Helio- and Asteroseismology: Towards a Golden Future, Proc. SOHO 14/GONG 2004 Workshop*, (ed. D. Danesy, ESA SP-559, Noordwijk, The Netherlands), 548.

117. Däppen, W. & Lin, C.-H. 2004, [The chemical composition and equation of state of the Sun inferred from seismic models through an inversion procedure], in *Helio- and Asteroseismology: Towards a Golden Future, Proc. SOHO 14/GONG 2004 Workshop*, (ed. D. Danesy, ESA SP-559, Noordwijk, The Netherlands), 400.

118. Mao, D., Mussack, K. & Däppen, W. 2004, [Development of molecular-dynamics tools to study hot dense Coulomb systems], in *Helio- and Asteroseismology: Towards a Golden Future, Proc. SOHO 14/GONG 2004 Workshop*, (ed. D. Danesy, ESA SP-559, Noordwijk, The Netherlands), 560.

119. Lin, C.-H., & Däppen, W. 2005, [An Inversion Procedure to Investigate the Equations of State and Chemical Composition of the Sun], *Astrophys. J.*, **623**, 556-570.

120. Däppen, W. 2006, [The Equation of State for the Solar Interior], *J. Phys. A: Math. Gen.*, **39**, 4441-4446.
121. Trampedach, R., Däppen, W. & Baturin, V.A. 2006, [A Synoptic Comparison of the Mihalas-Hummer-Däppen and OPAL Equations of State], *Astrophys. J.*, **646**, 560-578.
122. Mussack, K, Mao, D. & Däppen W. 2006, [Molecular-dynamics simulations of hot dense Coulomb systems], in *Proc. SOHO-18/GONG-2006/HELAS I Workshop, Beyond the spherical Sun* (eds. Karen Fletcher & Michael Thompson, ESA SP-624 [on CDROM], Noordwijk, The Netherlands), 20.1
123. Däppen, W. 2007, [Helioseismology and Plasma Physics], in *Solar and Stellar Physics Through Eclipses*, (eds. Osman Demircan, Selim O. Selam & Berahitdin Albayrak, Astronomical Society of the Pacific Conference Series 370), 3-12.
124. Däppen, W 2007, [Seismic abundance determination in the Sun and in stars], in *Unsolved Problems in Stellar Physics*, (eds. R J Stancliffe, G Houdek, R G Martin & C Tout, AIP Conference Proceedings 948, Melville, New York), 179-190.
125. Mussack, K, Mao, D. & Däppen W. 2007, [Evaluation of Molecular-Dynamics Simulations for the Study of Hot Dense Coulomb Systems] in *Unsolved Problems in Stellar Physics*, (eds. R J Stancliffe, G Houdek, R G Martin & C Tout, AIP Conference Proceedings 948, Melville, New York), 207-211.
126. Däppen, W. & Mao, D. 2008, [Rigorous and Phenomenological Equations of State], in *Proc. IAU, Vol. 4, Symposium S252*, (ed. Licai Deng & K.L. Chan), 27-34.
127. Däppen, W. & Mao, D. 2009, [A smooth equation of state for solar and stellar abundance determinations], *J. Phys. A: Math. Gen.*, **42**, 214006
128. Mao, D., Mussack, K., & Däppen, W. 2009, [Dynamic Screening in solar plasma], *Astrophys. J.*, **701**, 1204-1208.
129. Perez, A., Mussack, K., Däppen, W & Mao, D. 2009, [The Stellar Equation of State with the Path Integral Formalism. I. Domain of Validity], *Astronomy and Astrophysics*, **505**, 735-742.
130. Däppen, W. 2010, [Accurate and Versatile Equations of State for the Sun and Sun-like Stars], *Astrophysics and Space Science*, Published online: 5 February 2010.
131. Lin, H.-H. & Däppen, W. 2010, [Emulating the OPAL equation of state], *Astrophysics and Space Science*, Published online: 22 January 2010.
132. Mussack, K. & Däppen, W. 2010, [Dynamic screening in solar and stellar nuclear reactions], *Astrophysics and Space Science*, Published online: 7 January 2010.
133. Däppen, W. 2010, [High-precision equation-of-state formalisms for solar and stellar modeling], *Contributions to Plasma Physics*, Published Online: 20 May 2010.

134. Mussack, K. & Däppen, W. 2011, [Dynamic screening correction for solar p-p reaction rates], *Astrophys. J.*, **729**, 96.
135. Lin, H.-H. & Däppen, W. 2012, [A Practical Equation of State for the Sun and Solar-like Stars], *Contributions to Plasma Physics*, **52**, 126, DOI: 10.1002/ctpp.201100098.
136. Liang, Y.-C., Mussack, K. & Däppen, W. 2012, [Low-temperature Extensions of the Virial Equation of State for Solar Modeling], *Contributions to Plasma Physics*, **52**, 161, DOI: 10.1002/ctpp.201100100.
137. Däppen, W. & Mussack, K. 2012, [Dynamic Screening in Solar and Stellar Nuclear Reactions], *Contributions to Plasma Physics*, **52**, 149, DOI: 10.1002/ctpp.201100099.
138. T. S. Metcalfe, T. M. Brown, W. Däppen, K. B. MacGregor, A. Skumanich, 2014 [The End of an Era: Astrophysics at HAO/NCAR 1958-2012], *Journal of Astronomical History and Heritage*, preprint.
139. Baturin, V.A., Däppen, W., Morel, P., Oreshina, A.V., Thévenin, F., Gryaznov, V.K., Iosilevskiy, I.L., Starostin, A.N, and Fortov, V.E. 2017 [Equation of state SAHA-S meets stellar evolution code CESAM2k], *Astronomy and Astrophysics*, **606**, A129, DOI: 10.1051/0004-6361/201731248
140. Baturin, V.A., Däppen, W., Oreshina, A.V., Ayukov, S.V., and Gorshkov, A. B. 2019 [Interpolation of equation-of-state data], *Astronomy and Astrophysics*, **626**, A108, DOI: 10.1051/0004-6361/201935669
141. Baturin, V.A., Oreshina, A.V., Däppen, W., Ayukov, S.V., Gorshkov, A.B., Gryaznov, V.K., Iosilevskiy, I.L. 2022 [Ionization of heavy elements and the adiabatic exponent in the solar plasma] *Astronomy and Astrophysics*, **660**, A125, DOI: 10.1051/0004-6361/202141873