

Lars P Stixrude

List of Publications by Citations

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The third column is the impact factor (IF) of the journal, and the fourth column is the number of citations of the article.

133 papers	8,619 citations	51 h-index	91 g-index
142 ext. papers	9,314 ext. citations	8.1 avg, IF	6.35 L-index

#	Paper	IF	Citations
133	Thermodynamics of mantle minerals - I. Physical properties. <i>Geophysical Journal International</i> , 2005 , 162, 610-632	2.6	405
132	Thermodynamics of mantle minerals - II. Phase equilibria. <i>Geophysical Journal International</i> , 2011 , 184, 1180-1213	2.6	376
131	Structure and elasticity of MgO at high pressure. <i>American Mineralogist</i> , 1997 , 82, 51-60	2.9	372
130	First-principles elastic constants for the hcp transition metals Fe, Co, and Re at high pressure. <i>Physical Review B</i> , 1999 , 60, 791-799	3.3	325
129	Petrology, elasticity, and composition of the mantle transition zone. <i>Journal of Geophysical Research</i> , 1992 , 97, 6849		324
128	The effect of bulk composition and temperature on mantle seismic structure. <i>Earth and Planetary Science Letters</i> , 2008 , 275, 70-79	5.3	273
127	Structure and freezing of MgSiO ₃ liquid in Earth's lower mantle. <i>Science</i> , 2005 , 310, 297-9	33.3	243
126	High-Pressure Elasticity of Iron and Anisotropy of Earth's Inner Core. <i>Science</i> , 1995 , 267, 1972-5	33.3	228
125	Elasticity of iron at the temperature of the Earth's inner core. <i>Nature</i> , 2001 , 413, 57-60	50.4	220
124	Mineralogy and elasticity of the oceanic upper mantle: Origin of the low-velocity zone. <i>Journal of Geophysical Research</i> , 2005 , 110,		212
123	Iron at high pressure: Linearized-augmented-plane-wave computations in the generalized-gradient approximation. <i>Physical Review B</i> , 1994 , 50, 6442-6445	3.3	206
122	High-pressure elastic properties of major materials of Earth's mantle from first principles. <i>Reviews of Geophysics</i> , 2001 , 39, 507-534	23.1	199
121	Thermodynamics of silicate liquids in the deep Earth. <i>Earth and Planetary Science Letters</i> , 2009 , 278, 226-232	3.3	165
120	Thermoelasticity of Silicate Perovskite and Magnesio-wustite and Stratification of the Earth's Mantle. <i>Science</i> , 1992 , 257, 1099-101	33.3	153
119	Thermal properties of iron at high pressures and temperatures. <i>Physical Review B</i> , 1996 , 53, 8296-8309	3.3	146
118	Ab initio studies of high-pressure structural transformations in silica. <i>Physical Review B</i> , 1997 , 55, 3465-3471	3.3	131
117	First-principles simulations of liquid silica: Structural and dynamical behavior at high pressure. <i>Physical Review B</i> , 2007 , 76,	3.3	128

- 116 Elastic properties of orthorhombic MgSiO₃ perovskite at lower mantle pressures. *American Mineralogist*, **1997**, 82, 635-638 2.9 124
- 115 First-principles calculation of defect-formation energies in the Y₂(Ti,Sn,Zr)O₇ pyrochlore. *Physical Review B*, **2004**, 70, 3.3 123
- 114 Structure and sharpness of phase transitions and mantle discontinuities. *Journal of Geophysical Research*, **1997**, 102, 14835-14852 120
- 113 Self-consistent thermodynamic description of silicate liquids, with application to shock melting of MgO periclase and MgSiO₃ perovskite. *Geophysical Journal International*, **2009**, 178, 162-179 2.6 118
- 112 Ab initio elasticity of three high-pressure polymorphs of silica. *Geophysical Research Letters*, **1997**, 24, 3269-3272 4.9 115
- 111 Composition and temperature of Earth's inner core. *Journal of Geophysical Research*, **1997**, 102, 24729-24739 112
- 110 Hydrous silicate melt at high pressure. *Nature*, **2008**, 452, 983-6 50.4 112
- 109 Thermodynamics, structure, dynamics, and freezing of Mg₂SiO₄ liquid at high pressure. *Geochimica Et Cosmochimica Acta*, **2008**, 72, 1427-1441 5.5 110
- 108 Geophysics of Chemical Heterogeneity in the Mantle. *Annual Review of Earth and Planetary Sciences*, **2012**, 40, 569-595 15.3 109
- 107 Stability of orthorhombic MgSiO₃ perovskite in the Earth's lower mantle. *Nature*, **1993**, 364, 613-616 50.4 108
- 106 Influence of phase transformations on lateral heterogeneity and dynamics in Earth's mantle. *Earth and Planetary Science Letters*, **2007**, 263, 45-55 5.3 107
- 105 Thermal conductivity of periclase (MgO) from first principles. *Physical Review Letters*, **2010**, 104, 208501 7.4 101
- 104 Viscosity of MgSiO₃ liquid at Earth's mantle conditions: implications for an early magma ocean. *Science*, **2010**, 328, 740-2 33.3 97
- 103 Fundamental thermodynamic relations and silicate melting with implications for the constitution of D'. *Journal of Geophysical Research*, **1990**, 95, 19311 97
- 102 The 10 $\bar{1}$ phase: a high-pressure expandable sheet silicate stable during subduction of hydrated lithosphere. *Earth and Planetary Science Letters*, **2001**, 186, 125-141 5.3 90
- 101 Tight-binding computations of elastic anisotropy of Fe, Xe, and Si under compression. *Physical Review B*, **1997**, 56, 8575-8589 3.3 89
- 100 EChO. *Experimental Astronomy*, **2012**, 34, 311-353 1.3 82
- 99 First-principles study of illite-smectite and implications for clay mineral systems. *Nature*, **2002**, 420, 165-8 50.4 78

98	Elasticity of (Mg,Fe)SiO ₃ -perovskite at high pressures. <i>Geophysical Research Letters</i> , 2002 , 29, 34-1	4.9	78
97	Magnetism in dense hexagonal iron. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2004 , 101, 33-6	11.5	76
96	Structure and elasticity of serpentine at high-pressure. <i>Earth and Planetary Science Letters</i> , 2009 , 279, 11-19	5.3	75
95	Correlation of seismic and petrologic thermometers suggests deep thermal anomalies beneath hotspots. <i>Earth and Planetary Science Letters</i> , 2007 , 264, 308-316	5.3	73
94	Hydrogen incorporation in stishovite at high pressure and symmetric hydrogen bonding in β -AlOOH. <i>Earth and Planetary Science Letters</i> , 2004 , 221, 421-431	5.3	73
93	Thermodynamics of the MgO-SiO ₂ liquid system in Earth's lowermost mantle from first principles. <i>Earth and Planetary Science Letters</i> , 2013 , 361, 58-63	5.3	70
92	Structure of iron to 1 Gbar and 40,000 K. <i>Physical Review Letters</i> , 2012 , 108, 055505	7.4	70
91	First-principles calculation of the elastic moduli of sheet silicates and their application to shale anisotropy. <i>American Mineralogist</i> , 2011 , 96, 125-137	2.9	67
90	Calculated elastic constants and anisotropy of Mg ₂ SiO ₄ spinel at high pressure. <i>Geophysical Research Letters</i> , 1997 , 24, 2841-2844	4.9	66
89	Atomic structure of SiO ₂ glass and its response to pressure. <i>Physical Review B</i> , 1991 , 44, 2523-2534	3.3	64
88	Phase stability and shear softening in CaSiO ₃ perovskite at high pressure. <i>Physical Review B</i> , 2007 , 75,	3.3	62
87	Constraints on the crystalline structure of the inner core: Mechanical instability of BCC iron at high pressure. <i>Geophysical Research Letters</i> , 1995 , 22, 125-128	4.9	59
86	First principles molecular dynamics simulations of diopside (CaMgSi ₂ O ₆) liquid to high pressure. <i>Geochimica Et Cosmochimica Acta</i> , 2011 , 75, 3792-3802	5.5	56
85	First-principles calculations of the structural, dynamical, and electronic properties of liquid MgO. <i>Physical Review B</i> , 2006 , 73,	3.3	56
84	High-pressure proton disorder in brucite. <i>American Mineralogist</i> , 2006 , 91, 127-134	2.9	54
83	Bone chemical structure response to mechanical stress studied by high pressure Raman spectroscopy. <i>Calcified Tissue International</i> , 2005 , 76, 207-13	3.9	52
82	Elastic properties of MgSiO ₃ -perovskite under lower mantle conditions and the composition of the deep Earth. <i>Earth and Planetary Science Letters</i> , 2013 , 379, 1-12	5.3	50
81	Absence of lattice strain anomalies at the electronic topological transition in zinc at high pressure. <i>Physical Review B</i> , 2001 , 63,	3.3	49

80	First-principles molecular dynamics simulations of MgSiO ₃ glass: Structure, density, and elasticity at high pressure. <i>American Mineralogist</i> , 2014 , 99, 1304-1314	2.9	46
79	Magnetism in iron as a function of pressure. <i>Journal of Physics Condensed Matter</i> , 2004 , 16, S1109-S1119	1.8	46
78	Fluid helium at conditions of giant planetary interiors. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2008 , 105, 11071-11075	11.5	42
77	Inferring the thermochemical structure of the upper mantle from seismic data. <i>Geophysical Journal International</i> , 2009 , 179, 1169-1185	2.6	41
76	Simple covalent potential models of tetrahedral SiO ₂ : Applications to quartz and coesite at pressure. <i>Physics and Chemistry of Minerals</i> , 1988 , 16, 199	1.6	41
75	Spin crossover in ferropericlase from first-principles molecular dynamics. <i>Physical Review Letters</i> , 2015 , 114, 117202	7.4	40
74	Melting in super-earths. <i>Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences</i> , 2014 , 372, 20130076	3	40
73	Theoretical Methods for Calculating the Lattice Thermal Conductivity of Minerals. <i>Reviews in Mineralogy and Geochemistry</i> , 2010 , 71, 253-269	7.1	39
72	First-principles study of diffusion and viscosity of anorthite (CaAl ₂ Si ₂ O ₈) liquid at high pressure. <i>American Mineralogist</i> , 2011 , 96, 744-751	2.9	39
71	Visualization-based analysis of structural and dynamical properties of simulated hydrous silicate melt. <i>Physics and Chemistry of Minerals</i> , 2010 , 37, 103-117	1.6	39
70	Structure and elasticity of wadsleyite at high pressures. <i>American Mineralogist</i> , 2001 , 86, 1387-1395	2.9	39
69	Elastic constants and anisotropy of forsterite at high pressure. <i>Geophysical Research Letters</i> , 1997 , 24, 1963-1966	4.9	34
68	Petrological interpretation of deep crustal intrusive bodies beneath oceanic hotspot provinces. <i>Geochemistry, Geophysics, Geosystems</i> , 2013 , 14, 604-619	3.6	33
67	First-principles study of enhancement of transport properties of silica melt by water. <i>Physical Review Letters</i> , 2010 , 104, 215901	7.4	33
66	A novel topological compression mechanism in a covalent liquid. <i>Science</i> , 1990 , 250, 541-3	33.3	33
65	Al ₂ O ₃ incorporation in MgSiO ₃ perovskite and ilmenite. <i>Earth and Planetary Science Letters</i> , 2006 , 252, 152-161	5.3	32
64	Determination of the high-pressure properties of fayalite from first-principles calculations. <i>Earth and Planetary Science Letters</i> , 2010 , 289, 449-456	5.3	31
63	First-principles calculations of the lattice thermal conductivity of the lower mantle. <i>Earth and Planetary Science Letters</i> , 2015 , 427, 11-17	5.3	30

62	Estimates of the transition zone temperature in a mechanically mixed upper mantle. <i>Earth and Planetary Science Letters</i> , 2009 , 277, 244-252	5.3	30
61	Seismic velocities of major silicate and oxide phases of the lower mantle. <i>Journal of Geophysical Research</i> , 1999 , 104, 13025-13033		29
60	Primordial metallic melt in the deep mantle. <i>Geophysical Research Letters</i> , 2016 , 43, 3693-3699	4.9	29
59	Multidisciplinary Constraints on the Abundance of Diamond and Eclogite in the Cratonic Lithosphere. <i>Geochemistry, Geophysics, Geosystems</i> , 2018 , 19, 2062-2086	3.6	27
58	Akimotoite to perovskite phase transition in MgSiO ₃ . <i>Geophysical Research Letters</i> , 2004 , 31, n/a-n/a	4.9	27
57	Elastic constants and anisotropy of MgSiO ₃ perovskite, periclase, and SiO ₂ at high pressure. <i>Geodynamic Series</i> , 1998 , 83-96		27
56	The EChO science case. <i>Experimental Astronomy</i> , 2015 , 40, 329-391	1.3	26
55	Crystal chemistry of forsterite; a first-principles study. <i>American Mineralogist</i> , 1997 , 82, 663-671	2.9	26
54	The 1011 phase at high pressure by first principles calculations and implications for the petrology of subduction zones. <i>Earth and Planetary Science Letters</i> , 2007 , 260, 212-226	5.3	26
53	Electrical conductivity of SiO at extreme conditions and planetary dynamos. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2017 , 114, 9009-9013	11.5	25
52	Ab initio study of the elastic behavior of MgSiO ₃ ilmenite at high pressure. <i>Geophysical Research Letters</i> , 1999 , 26, 943-946	4.9	25
51	Spin crossover in Fe ₂ SiO ₄ liquid at high pressure. <i>Geophysical Research Letters</i> , 2014 , 41, 4512-4518	4.9	24
50	Talc under tension and compression: Spinodal instability, elasticity, and structure. <i>Journal of Geophysical Research</i> , 2002 , 107, ECV 2-1-ECV 2-10		22
49	Extrinsic Elastic Anisotropy in a Compositionally Heterogeneous Earth's Mantle. <i>Journal of Geophysical Research: Solid Earth</i> , 2019 , 124, 1671-1687	3.6	20
48	A silicate dynamo in the early Earth. <i>Nature Communications</i> , 2020 , 11, 935	17.4	19
47	First principles viscosity and derived models for MgO-SiO ₂ melt system at high temperature. <i>Geophysical Research Letters</i> , 2013 , 40, 94-99	4.9	19
46	Normal and inverse ringwoodite at high pressures. <i>American Mineralogist</i> , 1999 , 84, 288-293	2.9	18
45	Magnetic excitations and heat capacity of fayalite, Fe ₂ SiO ₄ . <i>American Mineralogist</i> , 2007 , 92, 481-490	2.9	17

44	Inner core anisotropy, anomalies in the time-averaged paleomagnetic field, and polarity transition paths. <i>Earth and Planetary Science Letters</i> , 1995 , 130, 75-85	5.3	17
43	Thermodynamics of the Earth's Mantle. <i>Reviews in Mineralogy and Geochemistry</i> , 2010 , 71, 465-484	7.1	16
42	Energetics, equation of state, and elasticity of NAL phase: Potential host for alkali and aluminum in the lower mantle. <i>Geophysical Research Letters</i> , 2012 , 39, n/a-n/a	4.9	15
41	Joint mineral physics and seismic wave traveltime analysis of upper mantle temperature. <i>Geology</i> , 2009 , 37, 363-366	5	14
40	Chapter 19. THEORY OF MINERALS AT HIGH PRESSURE 1998 , 639-672		14
39	Stability of iron crystal structures at 0.3–1.5 TPa. <i>Earth and Planetary Science Letters</i> , 2015 , 409, 299-306	5.3	13
38	Electronic conductivity of solid and liquid (Mg, Fe)O computed from first principles. <i>Earth and Planetary Science Letters</i> , 2018 , 490, 11-19	5.3	13
37	Spin crossover in liquid (Mg,Fe)O at extreme conditions. <i>Physical Review B</i> , 2016 , 93,	3.3	12
36	Theoretical Computation of Diffusion in Minerals and Melts. <i>Reviews in Mineralogy and Geochemistry</i> , 2010 , 72, 971-996	7.1	12
35	First-principles energetics and structural relaxation of antigorite. <i>American Mineralogist</i> , 2009 , 94, 1271-1278	12.78	12
34	Stability of the hcp phase and temperature variation of the axial ratio of iron near Earth-core conditions. <i>Journal of Physics Condensed Matter</i> , 2007 , 19, 016208	1.8	12
33	Stability of (Mg,Fe)SiO ₃ perovskite and the structure of the lowermost mantle. <i>Geophysical Research Letters</i> , 1992 , 19, 1057-1060	4.9	12
32	Constraining the Volume of Earth's Early Oceans With a Temperature-Dependent Mantle Water Storage Capacity Model. <i>AGU Advances</i> , 2021 , 2, e2020AV000323	5.4	12
31	Critical vaporization of MgSiO. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2018 , 115, 5371-5376	11.5	11
30	Thermodynamic Analysis of the System MgO-FeO-SiO ₂ at High Pressure and the Structure of the Lowermost Mantle. <i>Geophysical Monograph Series</i> , 2013 , 131-141	1.1	11
29	A first-principle investigation of antigorite up to 30 GPa: Structural behavior under compression. <i>American Mineralogist</i> , 2012 , 97, 1177-1186	2.9	11
28	Measuring the melting curve of iron at super-Earth core conditions.. <i>Science</i> , 2022 , 375, 202-205	33.3	10
27	Density and Elasticity of Model Upper Mantle Compositions and their Implications for Whole Mantle Structure. <i>Geophysical Monograph Series</i> , 111-130	1.1	10

26	New high-pressure phases in MOOH (M = Al, Ga, In). <i>American Mineralogist</i> , 2018 , 103, 1906-1917	2.9	10
25	Compression of tetrahedrally bonded SiO ₂ liquid and silicate liquid-crystal density inversion. <i>Geophysical Research Letters</i> , 1989 , 16, 1403-1406	4.9	9
24	The top-down crystallisation of Mercury's core. <i>Earth and Planetary Science Letters</i> , 2019 , 528, 115838	5.3	8
23	Heat and charge transport in H ₂ O at ice-giant conditions from ab initio molecular dynamics simulations. <i>Nature Communications</i> , 2020 , 11, 3605	17.4	8
22	Oceanic plateau of the Hawaiian mantle plume head subducted to the uppermost lower mantle. <i>Science</i> , 2020 , 370, 983-987	33.3	8
21	Physical properties of iron in the inner core. <i>Geodynamic Series</i> , 2003 , 137-161		7
20	Space-time multiresolution atomistic visualization of MgO and MgSiO ₃ liquid data. <i>Visual Geosciences</i> , 2007 , 11, 1-11		6
19	Melting of CaSiO ₃ Perovskite at High Pressure. <i>Geophysical Research Letters</i> , 2019 , 46, 2037-2044	4.9	6
18	Elasticity of mantle phases at high pressure and temperature. <i>Geophysical Monograph Series</i> , 2000 , 201-213		5
17	First Principles Theory of Mantle and Core Phases. <i>Reviews in Mineralogy and Geochemistry</i> , 2001 , 42, 319-343	7.1	5
16	Thermal and Tidal Evolution of Uranus with a Growing Frozen Core. <i>Planetary Science Journal</i> , 2021 , 2, 222	2.9	5
15	Deep fractionation of Hf in a solidifying magma ocean and its implications for tungsten isotopic heterogeneities in the mantle. <i>Earth and Planetary Science Letters</i> , 2021 , 562, 116873	5.3	4
14	Thermal Conductivity of Silicate Liquid Determined by Machine Learning Potentials. <i>Geophysical Research Letters</i> , 2021 , 48, e2021GL093806	4.9	4
13	Advances in high-pressure mineral physics: From the deep mantle to the core. <i>Physics of the Earth and Planetary Interiors</i> , 2009 , 174, 1-2	2.3	3
12	The science of EChO. <i>Proceedings of the International Astronomical Union</i> , 2010 , 6, 359-370	0.1	3
11	First-Principles Investigations of Solid Iron at High Pressure and Implications for the Earth's Inner Core. <i>Geophysical Monograph Series</i> , 1998 , 159-171	1.1	3
10	Mineral physics of the mantle. <i>Reviews of Geophysics</i> , 1995 , 33, 425	23.1	3
9	Thermal expansivity, heat capacity and bulk modulus of the mantle. <i>Geophysical Journal International</i> ,	2.6	3

8	9. First Principles Theory of Mantle and Core Phases 2001 , 319-344		2
7	Elasticity of Oxides and Ionics 2001 , 31-56		2
6	Entropy, dynamics, and freezing of CaSiO ₃ liquid. <i>Geochimica Et Cosmochimica Acta</i> , 2021 , 302, 1-17	5.5	2
5	22. Theoretical Computation of Diffusion in Minerals and Melts 2010 , 971-996		
4	Ab Initio Investigation of the High Pressure Elasticity of Mg ₂ SiO ₄ Forsterite and Ringwoodite. <i>Materials Research Society Symposia Proceedings</i> , 1997 , 499, 15		
3	Elasticity, Thermal Properties, and Molecular Dynamics Using Non-Empirical Tight-Binding. <i>Materials Research Society Symposia Proceedings</i> , 1997 , 491, 501		
2	Thermoelastic Properties of (Mg,Fe)SiO ₃ Perovskite. <i>Materials Research Society Symposia Proceedings</i> , 2002 , 718, 1		
1	Water storage capacity of the Martian mantle through time. <i>Icarus</i> , 2022 , 115113		3.8