Lars P Stixrude

List of Publications by Year in Descending Order

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	Measuring the melting curve of iron at super-Earth core conditions.. *Science*, **2022**, 375, 202-205	33.3	10
132	Water storage capacity of the Martian mantle through time. *Icarus*, **2022**, 115113	3.8	
131	Thermal and Tidal Evolution of Uranus with a Growing Frozen Core. *Planetary Science Journal*, **2021**, 2, 222	2.9	5
130	Deep fractionation of Hf in a solidifying magma ocean and its implications for tungsten isotopic heterogeneities in the mantle. *Earth and Planetary Science Letters*, **2021**, 562, 116873	5.3	4
129	Entropy, dynamics, and freezing of CaSiO3 liquid. *Geochimica Et Cosmochimica Acta*, **2021**, 302, 1-17	5.5	2
128	Constraining the Volume of Earth's Early Oceans With a Temperature-Dependent Mantle Water Storage Capacity Model. *AGU Advances*, **2021**, 2, e2020AV000323	5.4	12
127	Thermal Conductivity of Silicate Liquid Determined by Machine Learning Potentials. *Geophysical Research Letters*, **2021**, 48, e2021GL093806	4.9	4
126	A silicate dynamo in the early Earth. *Nature Communications*, **2020**, 11, 935	17.4	19
125	Heat and charge transport in HO at ice-giant conditions from ab initio molecular dynamics simulations. *Nature Communications*, **2020**, 11, 3605	17.4	8
124	Oceanic plateau of the Hawaiian mantle plume head subducted to the uppermost lower mantle. *Science*, **2020**, 370, 983-987	33.3	8
123	The top-down crystallisation of Mercury's core. *Earth and Planetary Science Letters*, **2019**, 528, 115838	5.3	8
122	Extrinsic Elastic Anisotropy in a Compositionally Heterogeneous Earth's Mantle. *Journal of Geophysical Research: Solid Earth*, **2019**, 124, 1671-1687	3.6	20
121	Melting of CaSiO Perovskite at High Pressure. *Geophysical Research Letters*, **2019**, 46, 2037-2044	4.9	6
120	Multidisciplinary Constraints on the Abundance of Diamond and Eclogite in the Cratonic Lithosphere. *Geochemistry, Geophysics, Geosystems*, **2018**, 19, 2062-2086	3.6	27
119	Critical vaporization of MgSiO. *Proceedings of the National Academy of Sciences of the United States of America*, **2018**, 115, 5371-5376	11.5	11
118	Electronic conductivity of solid and liquid (Mg, Fe)O computed from first principles. *Earth and Planetary Science Letters*, **2018**, 490, 11-19	5.3	13
117	New high-pressure phases in MOOH (M = Al, Ga, In). *American Mineralogist*, **2018**, 103, 1906-1917	2.9	10

116	Electrical conductivity of SiO at extreme conditions and planetary dynamos. *Proceedings of the National Academy of Sciences of the United States of America*, **2017**, 114, 9009-9013	11.5	25
115	Spin crossover in liquid (Mg,Fe)O at extreme conditions. *Physical Review B*, **2016**, 93,	3.3	12
114	Primordial metallic melt in the deep mantle. *Geophysical Research Letters*, **2016**, 43, 3693-3699	4.9	29
113	First-principles calculations of the lattice thermal conductivity of the lower mantle. *Earth and Planetary Science Letters*, **2015**, 427, 11-17	5.3	30
112	Spin crossover in ferropericlase from first-principles molecular dynamics. *Physical Review Letters*, **2015**, 114, 117202	7.4	40
111	Stability of iron crystal structures at 0.3–1.5 TPa. *Earth and Planetary Science Letters*, **2015**, 409, 299-306	5.3	13
110	The EChO science case. *Experimental Astronomy*, **2015**, 40, 329-391	1.3	26
109	Melting in super-earths. *Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences*, **2014**, 372, 20130076	3	40
108	First-principles molecular dynamics simulations of MgSiO3 glass: Structure, density, and elasticity at high pressure. *American Mineralogist*, **2014**, 99, 1304-1314	2.9	46
107	Spin crossover in Fe2SiO4 liquid at high pressure. *Geophysical Research Letters*, **2014**, 41, 4512-4518	4.9	24
106	Elastic properties of MgSiO3-perovskite under lower mantle conditions and the composition of the deep Earth. *Earth and Planetary Science Letters*, **2013**, 379, 1-12	5.3	50
105	Thermodynamics of the MgO–SiO2 liquid system in Earth's lowermost mantle from first principles. *Earth and Planetary Science Letters*, **2013**, 361, 58-63	5.3	70
104	Petrological interpretation of deep crustal intrusive bodies beneath oceanic hotspot provinces. *Geochemistry, Geophysics, Geosystems*, **2013**, 14, 604-619	3.6	33
103	First principles viscosity and derived models for MgO-SiO2 melt system at high temperature. *Geophysical Research Letters*, **2013**, 40, 94-99	4.9	19
102	Thermodynamic Analysis of the System MgO-FeO-SiO2 at High Pressure and the Structure of the Lowermost Mantle. *Geophysical Monograph Series*, **2013**, 131-141	1.1	11
101	Structure of iron to 1 Gbar and 40, 000 K. *Physical Review Letters*, **2012**, 108, 055505	7.4	70
100	EChO. *Experimental Astronomy*, **2012**, 34, 311-353	1.3	82
99	Geophysics of Chemical Heterogeneity in the Mantle. *Annual Review of Earth and Planetary Sciences* , **2012**, 40, 569-595	15.3	109

98	A first-principle investigation of antigorite up to 30 GPa: Structural behavior under compression. *American Mineralogist*, **2012**, 97, 1177-1186	2.9	11
97	Energetics, equation of state, and elasticity of NAL phase: Potential host for alkali and aluminum in the lower mantle. *Geophysical Research Letters*, **2012**, 39, n/a-n/a	4.9	15
96	First principles molecular dynamics simulations of diopside (CaMgSi2O6) liquid to high pressure. *Geochimica Et Cosmochimica Acta*, **2011**, 75, 3792-3802	5.5	56
95	Thermodynamics of mantle minerals - II. Phase equilibria. *Geophysical Journal International*, **2011**, 184, 1180-1213	2.6	376
94	First-principles calculation of the elastic moduli of sheet silicates and their application to shale anisotropy. *American Mineralogist*, **2011**, 96, 125-137	2.9	67
93	First-principles study of diffusion and viscosity of anorthite (CaAl2Si2O8) liquid at high pressure. *American Mineralogist*, **2011**, 96, 744-751	2.9	39
92	22. Theoretical Computation of Diffusion in Minerals and Melts **2010**, 971-996		
91	Thermodynamics of the Earth's Mantle. *Reviews in Mineralogy and Geochemistry*, **2010**, 71, 465-484	7.1	16
90	Thermal conductivity of periclase (MgO) from first principles. *Physical Review Letters*, **2010**, 104, 208501	7.4	101
89	Theoretical Methods for Calculating the Lattice Thermal Conductivity of Minerals. *Reviews in Mineralogy and Geochemistry*, **2010**, 71, 253-269	7.1	39
88	First-principles study of enhancement of transport properties of silica melt by water. *Physical Review Letters*, **2010**, 104, 215901	7.4	33
87	Determination of the high-pressure properties of fayalite from first-principles calculations. *Earth and Planetary Science Letters*, **2010**, 289, 449-456	5.3	31
86	Theoretical Computation of Diffusion in Minerals and Melts. *Reviews in Mineralogy and Geochemistry*, **2010**, 72, 971-996	7.1	12
85	Viscosity of MgSiO3 liquid at Earth's mantle conditions: implications for an early magma ocean. *Science*, **2010**, 328, 740-2	33.3	97
84	The science of EChO. *Proceedings of the International Astronomical Union*, **2010**, 6, 359-370	0.1	3
83	Visualization-based analysis of structural and dynamical properties of simulated hydrous silicate melt. *Physics and Chemistry of Minerals*, **2010**, 37, 103-117	1.6	39
82	First-principles energetics and structural relaxation of antigorite. *American Mineralogist*, **2009**, 94, 1271-1278	2.9	12
81	Self-consistent thermodynamic description of silicate liquids, with application to shock melting of MgO periclase and MgSiO3perovskite. *Geophysical Journal International*, **2009**, 178, 162-179	2.6	118

80	Inferring the thermochemical structure of the upper mantle from seismic data. *Geophysical Journal International*, **2009**, 179, 1169-1185	2.6	41
79	Estimates of the transition zone temperature in a mechanically mixed upper mantle. *Earth and Planetary Science Letters*, **2009**, 277, 244-252	5.3	30
78	Thermodynamics of silicate liquids in the deep Earth. *Earth and Planetary Science Letters*, **2009**, 278, 226-232	5.3	165
77	Structure and elasticity of serpentine at high-pressure. *Earth and Planetary Science Letters*, **2009**, 279, 11-19	5.3	75
76	Advances in high-pressure mineral physics: From the deep mantle to the core. *Physics of the Earth and Planetary Interiors*, **2009**, 174, 1-2	2.3	3
75	Joint mineral physics and seismic wave traveltime analysis of upper mantle temperature. *Geology*, **2009**, 37, 363-366	5	14
74	Hydrous silicate melt at high pressure. *Nature*, **2008**, 452, 983-6	50.4	112
73	The effect of bulk composition and temperature on mantle seismic structure. *Earth and Planetary Science Letters*, **2008**, 275, 70-79	5.3	273
72	Thermodynamics, structure, dynamics, and freezing of Mg2SiO4 liquid at high pressure. *Geochimica Et Cosmochimica Acta*, **2008**, 72, 1427-1441	5.5	110
71	Fluid helium at conditions of giant planetary interiors. *Proceedings of the National Academy of Sciences of the United States of America*, **2008**, 105, 11071-11075	11.5	42
70	Magnetic excitations and heat capacity of fayalite, Fe2SiO4. *American Mineralogist*, **2007**, 92, 481-490	2.9	17
69	Space□time multiresolution atomistic visualization of MgO and MgSiO3 liquid data. *Visual Geosciences*, **2007**, 11, 1-11		6
68	Stability of the hcp phase and temperature variation of the axial ratio of iron near Earth-core conditions. *Journal of Physics Condensed Matter*, **2007**, 19, 016208	1.8	12
67	Phase stability and shear softening in CaSiO3 perovskite at high pressure. *Physical Review B*, **2007**, 75,	3.3	62
66	The 10□□phase at high pressure by first principles calculations and implications for the petrology of subduction zones. *Earth and Planetary Science Letters*, **2007**, 260, 212-226	5.3	26
65	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
64	Correlation of seismic and petrologic thermometers suggests deep thermal anomalies beneath hotspots. *Earth and Planetary Science Letters*, **2007**, 264, 308-316	5.3	73
63	First-principles simulations of liquid silica: Structural and dynamical behavior at high pressure. *Physical Review B*, **2007**, 76,	3.3	128

62	High-pressure proton disorder in brucite. *American Mineralogist*, **2006**, 91, 127-134	2.9	54
61	First-principles calculations of the structural, dynamical, and electronic properties of liquid MgO. *Physical Review B*, **2006**, 73,	3.3	56
60	Al2O3 incorporation in MgSiO3 perovskite and ilmenite. *Earth and Planetary Science Letters*, **2006**, 252, 152-161	5.3	32
59	Structure and freezing of MgSiO3 liquid in Earth's lower mantle. *Science*, **2005**, 310, 297-9	33.3	243
58	Mineralogy and elasticity of the oceanic upper mantle: Origin of the low-velocity zone. *Journal of Geophysical Research*, **2005**, 110,		212
57	Thermodynamics of mantle minerals - I. Physical properties. *Geophysical Journal International*, **2005**, 162, 610-632	2.6	405
56	Bone chemical structure response to mechanical stress studied by high pressure Raman spectroscopy. *Calcified Tissue International*, **2005**, 76, 207-13	3.9	52
55	Magnetism in dense hexagonal iron. *Proceedings of the National Academy of Sciences of the United States of America*, **2004**, 101, 33-6	11.5	76
54	Akimotoite to perovskite phase transition in MgSiO3. *Geophysical Research Letters*, **2004**, 31, n/a-n/a	4.9	27
53	Magnetism in iron as a function of pressure. *Journal of Physics Condensed Matter*, **2004**, 16, S1109-S1119	1.8	46
52	First-principles calculation of defect-formation energies in the Y2(Ti,Sn,Zr)2O7 pyrochlore. *Physical Review B*, **2004**, 70,	3.3	123
51	Hydrogen incorporation in stishovite at high pressure and symmetric hydrogen bonding in δ-AlOOH. *Earth and Planetary Science Letters*, **2004**, 221, 421-431	5.3	73
50	Physical properties of iron in the inner core. *Geodynamic Series*, **2003**, 137-161		7
49	First-principles study of illite-smectite and implications for clay mineral systems. *Nature*, **2002**, 420, 165-8	30.4	78
48	Elasticity of (Mg,Fe)SiO3-perovskite at high pressures. *Geophysical Research Letters*, **2002**, 29, 34-1	4.9	78
47	Talc under tension and compression: Spinodal instability, elasticity, and structure. *Journal of Geophysical Research*, **2002**, 107, ECV 2-1-ECV 2-10		22
46	Thermoelastic Properties of (Mg,Fe)SiO3 Perovskite. *Materials Research Society Symposia Proceedings*, **2002**, 718, 1		
45	Structure and elasticity of wadsleyite at high pressures. *American Mineralogist*, **2001**, 86, 1387-1395	2.9	39

44	Elasticity of iron at the temperature of the Earth's inner core. *Nature*, **2001**, 413, 57-60	50.4	220
43	Absence of lattice strain anomalies at the electronic topological transition in zinc at high pressure. *Physical Review B*, **2001**, 63,	3.3	49
42	High-pressure elastic properties of major materials of Earth's mantle from first principles. *Reviews of Geophysics*, **2001**, 39, 507-534	23.1	199
41	First Principles Theory of Mantle and Core Phases. *Reviews in Mineralogy and Geochemistry*, **2001**, 42, 319-343	7.1	5
40	The 10Å 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
39	9. First Principles Theory of Mantle and Core Phases **2001**, 319-344		2
38	Elasticity of Oxides and Ionics **2001**, 31-56		2
37	Elasticity of mantle phases at high pressure and temperature. *Geophysical Monograph Series*, **2000**, 201-213		5
36	First-principles elastic constants for the hcp transition metals Fe, Co, and Re at high pressure. *Physical Review B*, **1999**, 60, 791-799	3.3	325
35	Ab initio study of the elastic behavior of MgSiO3 ilmenite at high pressure. *Geophysical Research Letters*, **1999**, 26, 943-946	4.9	25
34	Seismic velocities of major silicate and oxide phases of the lower mantle. *Journal of Geophysical Research*, **1999**, 104, 13025-13033		29
33	Normal and inverse ringwoodite at high pressures. *American Mineralogist*, **1999**, 84, 288-293	2.9	18
32	Elastic constants and anisotropy of MgSiO3 perovskite, periclase, and SiO2 at high pressure. *Geodynamic Series*, **1998**, 83-96		27
31	First-Principles Investigations of Solid Iron at High Pressure and Implications for the Earth's Inner Core. *Geophysical Monograph Series*, **1998**, 159-171	1.1	3
30	Chapter 19. THEORY OF MINERALS AT HIGH PRESSURE **1998**, 639-672		14
29	Tight-binding computations of elastic anisotropy of Fe, Xe, and Si under compression. *Physical Review B*, **1997**, 56, 8575-8589	3.3	89
28	Structure and elasticity of MgO at high pressure. *American Mineralogist*, **1997**, 82, 51-60	2.9	372
27	Ab Initio Investigation of the High Pressure Elasticity of Mg2SiO4 Forsterite and Ringwoodite. *Materials Research Society Symposia Proceedings*, **1997**, 499, 15		

26	Elasticity, Thermal Properties, and Molecular Dynamics Using Non-Empirical Tight-Binding. *Materials Research Society Symposia Proceedings*, **1997**, 491, 501		
25	Ab initio elasticity of three high-pressure polymorphs of silica. *Geophysical Research Letters*, **1997**, 24, 3269-3272	4.9	115
24	Structure and sharpness of phase transitions and mantle discontinuities. *Journal of Geophysical Research*, **1997**, 102, 14835-14852		120
23	Elastic constants and anisotropy of forsterite at high pressure. *Geophysical Research Letters*, **1997**, 24, 1963-1966	4.9	34
22	Calculated elastic constants and anisotropy of Mg2SiO4 spinel at high pressure. *Geophysical Research Letters*, **1997**, 24, 2841-2844	4.9	66
21	Ab initio studies of high-pressure structural transformations in silica. *Physical Review B*, **1997**, 55, 3465-3471	3.3	131
20	Elastic properties of orthorhombic MgSiO3perovskite at lower mantle pressures. *American Mineralogist*, **1997**, 82, 635-638	2.9	124
19	Crystal chemistry of forsterite; a first-principles study. *American Mineralogist*, **1997**, 82, 663-671	2.9	26
18	Composition and temperature of Earth's inner core. *Journal of Geophysical Research*, **1997**, 102, 24729-24739		112
17	Thermal properties of iron at high pressures and temperatures. *Physical Review B*, **1996**, 53, 8296-8309	3.3	146
16	Mineral physics of the mantle. *Reviews of Geophysics*, **1995**, 33, 425	23.1	3
15	Inner core anisotropy, anomalies in the time-averaged paleomagnetic field, and polarity transition paths. *Earth and Planetary Science Letters*, **1995**, 130, 75-85	5.3	17
14	Constraints on the crystalline structure of the inner core: Mechanical instability of BCC iron at high pressure. *Geophysical Research Letters*, **1995**, 22, 125-128	4.9	59
13	High-Pressure Elasticity of Iron and Anisotropy of Earth's Inner Core. *Science*, **1995**, 267, 1972-5	33.3	228
12	Iron at high pressure: Linearized-augmented-plane-wave computations in the generalized-gradient approximation. *Physical Review B*, **1994**, 50, 6442-6445	3.3	206
11	Stability of orthorhombic MgSiO3 perovskite in the Earth's lower mantle. *Nature*, **1993**, 364, 613-616	50.4	108
10	Thermoelasticity of Silicate Perovskite and Magnesiowustite and Stratification of the Earth's Mantle. *Science*, **1992**, 257, 1099-101	33.3	153
9	Stability of (Mg,Fe)SiO3 perovskite and the structure of the lowermost mantle. *Geophysical Research Letters*, **1992**, 19, 1057-1060	4.9	12

8	Petrology, elasticity, and composition of the mantle transition zone. *Journal of Geophysical Research*, **1992**, 97, 6849		324
7	Atomic structure of SiO2 glass and its response to pressure. *Physical Review B*, **1991**, 44, 2523-2534	3.3	64
6	A novel topological compression mechanism in a covalent liquid. *Science*, **1990**, 250, 541-3	33.3	33
5	Fundamental thermodynamic relations and silicate melting with implications for the constitution of D?. *Journal of Geophysical Research*, **1990**, 95, 19311		97
4	Compression of tetrahedrally bonded SIO2 liquid and silicate liquid-crystal density inversion. *Geophysical Research Letters*, **1989**, 16, 1403-1406	4.9	9
3	Simple covalent potential models of tetrahedral SiO2: Applications to □quartz and coesite at pressure. *Physics and Chemistry of Minerals*, **1988**, 16, 199	1.6	41
2	Density and Elasticity of Model Upper Mantle Compositions and their Implications for Whole Mantle Structure. *Geophysical Monograph Series*,111-130	1.1	10
1	Thermal expansivity, heat capacity and bulk modulus of the mantle. *Geophysical Journal International*,	2.6	3