Steven D Jacobsen

List of Publications by Year
in descending order

138 papers	6,350 citations	61857 43 h-index	74018 75 g-index
140 all docs	140 docs citations	140 times ranked	4491 citing authors

#	Article	IF	Citations
1	Effective hydrostatic limits of pressure media for high-pressure crystallographic studies. Journal of Applied Crystallography, 2007, 40, 26-32.	1.9	440
2	Spin transition of iron in magnesiowÃ¼stite in the Earth's lower mantle. Nature, 2005, 436, 377-380.	13.7	323
3	Dehydration melting at the top of the lower mantle. Science, 2014, 344, 1265-1268.	6.0	263
4	Rapid magma ascent recorded by water diffusion profiles in mantle olivine. Geology, 2006, 34, 429.	2.0	255
5	The COMPRES/GSECARS gas-loading system for diamond anvil cells at the Advanced Photon Source. High Pressure Research, 2008, 28, 273-292.	0.4	225
6	Spin Transition Zone in Earth's Lower Mantle. Science, 2007, 317, 1740-1743.	6.0	196
7	Cation sorption on the muscovite (001) surface in chloride solutions using high-resolution X-ray reflectivity. Geochimica Et Cosmochimica Acta, 2006, 70, 3549-3565.	1.6	182
8	Elasticity of (Mg,Fe)O Through the Spin Transition of Iron in the Lower Mantle. Science, 2008, 319, 451-453.	6.0	167
9	Reduced Radiative Conductivity of Low-Spin (Mg,Fe)O in the Lower Mantle. Science, 2006, 312, 1205-1208.	6.0	162
10	Structure and elasticity of single-crystal (Mg,Fe)O and a new method of generating shear waves for gigahertz ultrasonic interferometry. Journal of Geophysical Research, 2002, 107, ECV 4-1.	3.3	149
11	A systematic study of OH in hydrous wadsleyite from polarized FTIR spectroscopy and single-crystal X-ray diffraction: Oxygen sites for hydrogen storage in Earthâ€™s interior. American Mineralogist, 2005, 90, 61-70.	0.9	120
12	Sound velocities and elastic constants of iron-bearing hydrous ringwoodite. Physics of the Earth and Planetary Interiors, 2004, 143-144, 47-56.	0.7	114
13	Structural systematics of hydrous ringwoodite and water in Earthâ€™s interior. American Mineralogist, 2003, 88, 1402-1407.	0.9	110
14	Hydrogen solubility and speciation in natural, gem-quality chromian diopside. American Mineralogist, 2004, 89, 941-949.	0.9	101
15	Radiative conductivity in the Earthâ€™s lower mantle. Nature, 2008, 456, 231-234.	13.7	91
16	Compression of single-crystal magnesium oxide to 118 GPa and a ruby pressure gauge for helium pressure media. American Mineralogist, 2008, 93, 1823-1828.	0.9	89
17	Nanocrystalline diamond synthesized from C60. Diamond and Related Materials, 2005, 14, 16-22.	1.8	85
18	Crystal structure of monoclinic hydrous wadsleyite [beta -(Mg,Fe)₂SiO₄]. American Mineralogist, 1997, 82, 270-275.	0.9	82

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19	High-pressure elasticity of a natural magnetite crystal. American Mineralogist, 2004, 89, 1061-1066.	0.9	82
20	Degassing of reduced carbon from planetary basalts. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, 8010-8013.	3.3	81
21	Effects of hydration on the elastic properties of olivine. Geophysical Research Letters, 2008, 35, .	1.5	79
22	Pressure-induced electronic spin transition of iron in magnesiowustite-(Mg,Fe)O. Physical Review B, 2006, 73, .	1.1	78
23	Effect of Water on the Equation of State of Nominally Anhydrous Minerals. Reviews in Mineralogy and Geochemistry, 2006, 62, 321-342.	2.2	77
24	Speciation and solubility of reduced Câ€“Oâ€“Hâ€“N volatiles in mafic melt: Implications for volcanism, atmospheric evolution, and deep volatile cycles in the terrestrial planets. Geochimica Et Cosmochimica Acta, 2015, 171, 283-302.	1.6	75
25	Thermal conductivity of lower-mantle minerals. Physics of the Earth and Planetary Interiors, 2009, 174, 24-32.	0.7	74
26	Elasticity of hydrous wadsleyite to 12 GPa: Implications for Earth's transition zone. Geophysical Research Letters, 2008, 35, .	1.5	72
27	Compression of witherite to 8 GPa and the crystal structure of BaCO 3 II. Physics and Chemistry of Minerals, 2000, 27, 467-473.	0.3	70
28	Sound velocities of hydrous ringwoodite to 16GPa and 673K. Earth and Planetary Science Letters, 2012, 331-332, 112-119.	1.8	66
29	Crystal structures and compressibilities of synthetic 2M1 and 3T phengite micas. European Journal of Mineralogy, 2000, 12, 955-963.	0.4	63
30	Boronâ€“oxygen complex yields n-type surface layer in semiconducting diamond. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 7703-7711.	3.3	60
31	Al, Fe substitution in the MgSiO3 perovskite structure: A single-crystal X-ray diffraction study. Physics of the Earth and Planetary Interiors, 2006, 155, 96-103.	0.7	58
32	Sound velocities of ferropericlase in the Earth's lower mantle. Geophysical Research Letters, 2006, 33, .	1.5	57
33	Evidence for H2O-bearing fluids in the lower mantle from diamond inclusion. Lithos, 2016, 265, 237-243.	0.6	57
34	Pressure-Induced Magnetization in FeO: Evidence from Elasticity and MÃ¶ssbauer Spectroscopy. Physical Review Letters, 2004, 93, 215502.	2.9	55
35	High pressure crystal chemistry of hydrous ringwoodite and water in the Earthâ€™s interior. Physics of the Earth and Planetary Interiors, 2004, 143-144, 271-278.	0.7	55
36	Effects of hydration on the structure and compressibility of wadsleyite, Â-(Mg2SiO4). American Mineralogist, 2008, 93, 598-607.	0.9	53

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37	Shear waves in the diamond-anvil cell reveal pressure-induced instability in (Mg,Fe)O. Proceedings of the National Academy of Sciences of the United States of America, 2004, 101, 5867-5871.	3.3	51
38	Effect of hydration on the single-crystal elasticity of Fe-bearing wadsleyite to 12 GPa. American Mineralogist, 2011, 96, 1606-1612.	0.9	51
39	Velocity crossover between hydrous and anhydrous forsterite at high pressures. Earth and Planetary Science Letters, 2010, 293, 250-258.	1.8	49
40	Sound velocities and elastic constants of ZnAl2O4 spinel and implications for spinel-elasticity systematics. American Mineralogist, 2006, 91, 1049-1054.	0.9	48
41	Nominally Anhydrous Minerals and Earth's Deep Water Cycle. Geophysical Monograph Series, 0, , 1-11.	0.1	48
42	The flux growth of magnesium silicate perovskite single crystals. American Mineralogist, 2004, 89, 807-811.	0.9	47
43	Compressibility and thermal expansion of hydrous ringwoodite with 2.5(3) wt% H2O. American Mineralogist, 2012, 97, 573-582.	0.9	47
44	Single-crystal elasticity and sound velocities of (Mg0.94Fe0.06)O ferropericlase to 20 GPa. Journal of Geophysical Research, 2006, 111, .	3.3	43
45	Temperature dependence and mechanism of hydrogen incorporation in olivine at 12.5â€“14.0 GPa. Geophysical Research Letters, 2007, 34, .	1.5	42
46	Single-crystal synchrotron X-ray diffraction study of wÃ¼stite and magnesiowÃ¼stite at lower-mantle pressures. Journal of Synchrotron Radiation, 2005, 12, 577-583.	1.0	41
47	Elasticity of cubic boron nitride under ambient conditions. Journal of Applied Physics, 2011, 109, 063521.	1.1	41
48	Creating Binary Cuâ€“Bi Compounds via High-Pressure Synthesis: A Combined Experimental and Theoretical Study. Chemistry of Materials, 2017, 29, 5276-5285.	3.2	39
49	Single-crystal elasticity of wadsleyites, Î²-Mg2SiO4, containing 0.37â€“1.66Âwt.% H2O. Earth and Planetary Science Letters, 2008, 266, 78-89.	1.8	38
50	Minerals in cement chemistry: A single-crystal neutron diffraction and Raman spectroscopic study of thaumasite, Ca3Si(OH)6(CO3)(SO4){middle dot}12H2O. American Mineralogist, 2012, 97, 1060-1069.	0.9	37
51	Two proton positions in the very strong hydrogen bond of serandite, NaMn₂[Si₃O₈(OH)]. American Mineralogist, 2000, 85, 745-752.	0.9	36
52	Comparative Crystal Chemistry of Dense Oxide Minerals. Reviews in Mineralogy and Geochemistry, 2000, 41, 157-186.	2.2	36
53	Discovery of FeBi2. ACS Central Science, 2016, 2, 867-871.	5.3	35
54	Effect of H2O on upper mantle phase transitions in MgSiO3: Is the depth of the seismic X-discontinuity an indicator of mantle water content?. Physics of the Earth and Planetary Interiors, 2010, 183, 234-244.	0.7	33

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55	Raman spectroscopy study of C-O-H-N speciation in reduced basaltic glasses: Implications for reduced planetary mantles. Geochimica Et Cosmochimica Acta, 2019, 265, 32-47.	1.6	33
56	Thermal expansion of hydrated six-coordinate silicon in thaumasite, Ca3Si(OH)6(CO3)(SO4)ï¿½12H2O. Physics and Chemistry of Minerals, 2003, 30, 321-329.	0.3	31
57	Effect of Water on the Sound Velocities of Ringwoodite in the Transition Zone. Geophysical Monograph Series, 0, , 131-145.	0.1	31
58	Earth's Deep Water Cycle. Geophysical Monograph Series, 2006, , .	0.1	31
59	Influence of Hydrogen-Related Defects on the Electrical Conductivity and Plastic Deformation of Mantle Minerals: A Critical Review. Geophysical Monograph Series, 2013, , 113-129.	0.1	29
60	Anomalous density and elastic properties of basalt at high pressure: Reevaluating of the effect of melt fraction on seismic velocity in the Earth's crust and upper mantle. Journal of Geophysical Research: Solid Earth, 2016, 121, 4232-4248.	1.4	29
61	Elastic properties of transparent nano-polycrystalline diamond measured by GHz-ultrasonic interferometry and resonant sphere methods. Physics of the Earth and Planetary Interiors, 2014, 228, 47-55.	0.7	28
62	Water partitioning between bridgmanite and postperovskite in the lowermost mantle. Earth and Planetary Science Letters, 2016, 454, 20-27.	1.8	28
63	Comparative Crystal Chemistry of Orthosilicate Minerals. Reviews in Mineralogy and Geochemistry, 2000, 41, 187-209.	2.2	27
64	Influence of Water on Major Phase Transitions in the Earth's Mantle. Geophysical Monograph Series, 0, , 95-111.	0.1	27
65	Water Content in the Mantle Transition Zone Beneath the North Pacific Derived from the Electrical Conductivity Anomaly. Geophysical Monograph Series, 2013, , 171-179.	0.1	26
66	Radiative heat transfer in a hydrous mantle transition zone. Earth and Planetary Science Letters, 2012, 357-358, 130-136.	1.8	25
67	Seismic Evidence for Subduction-Transported Water in the Lower Mantle. Geophysical Monograph Series, 2013, , 251-261.	0.1	25
68	Comparative compressibility of hydrous wadsleyite and ringwoodite: Effect of H₂O and implications for detecting water in the transition zone. Journal of Geophysical Research: Solid Earth, 2015, 120, 8259-8280.	1.4	25
69	Quantification of water in hydrous ringwoodite. Frontiers in Earth Science, 2015, 2, .	0.8	25
70	Ultrahard stitching of nanotwinned diamond and cubic boron nitride in C2-BN composite. Scientific Reports, 2016, 6, 30518.	1.6	24
71	Resonant X-ray emission study of the lower-mantle ferropericlase at high pressures. American Mineralogist, 2010, 95, 1125-1131.	0.9	23
72	Towards Mapping the Three-Dimensional Distribution of Water in the Transition Zone from P-Velocity Tomography and 660-Km Discontinuity Depths. Geophysical Monograph Series, 2013, , 237-249.	0.1	23

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73	The role of ceramic and glass science research in meeting societal challenges: Report from an <scp>NSF</scp>â€sponsored workshop. Journal of the American Ceramic Society, 2017, 100, 1777-1803.	1.9	23
74	Gigahertz ultrasonic interferometry at highPandT: new tools for obtaining a thermodynamic equation of state. Journal of Physics Condensed Matter, 2002, 14, 11525-11530.	0.7	22
75	Spin transition of Fe3+ in Al-bearing phase D: An alternative explanation for small-scale seismic scatterers in the mid-lower mantle. Earth and Planetary Science Letters, 2013, 382, 1-9.	1.8	22
76	Microanalysis of the iron oxidation state in (Mg,Fe)O and application to the study of microscale processes. Contributions To Mineralogy and Petrology, 2011, 162, 1249-1257.	1.2	20
77	Hydrogen Incorporation in Natural Mantle Olivines. Geophysical Monograph Series, 0, , 45-56.	0.1	20
78	A Water-Rich Transition Zone Beneath the Eastern United States and Gulf of Mexico from Multiple ScS Reverberations. Geophysical Monograph Series, 0, , 181-193.	0.1	20
79	Towards Mapping the Three-Dimensional Distribution of Water in the Upper Mantle from Velocity and Attenuation Tomography. Geophysical Monograph Series, 2013, , 225-236.	0.1	20
80	Sound wave velocities and elastic constants for MagnesiowÃ¼stite using gigahertz interferometry. Geophysical Research Letters, 2000, 27, 799-802.	1.5	19
81	Infrared properties of ferropericlase<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:msub><mml:mrow><mml:mtext>Mg</mml:mtext></mml:mrow><mml:mrow><mml:mn>1</mml:mn></mml:mrow></mml:msub></mml:mrow></mml:math>O: Experiment and theory. Physical Review B, 2008, 77, .	1.8	18
82	Correction to â€œEffects of hydration on the elastic properties of olivineâ€• Geophysical Research Letters, 2009, 36, .	1.5	18
83	Elastic relaxations associated with the Pmar 3 m â€“ Rar 3c transition in LaAlO₃: I. Single crystal elastic moduli at room temperature. Journal of Physics Condensed Matter, 2010, 22, 035403.	0.7	18
84	Stability and equation of state of post-aragonite BaCO3. Physics and Chemistry of Minerals, 2013, 40, 447-453.	0.3	17
85	Elasticity of ferropericlase and seismic heterogeneity in the Earth's lower mantle. Journal of Geophysical Research: Solid Earth, 2016, 121, 8488-8500.	1.4	17
86	Computationally Directed Discovery of MoBi₂. Journal of the American Chemical Society, 2021, 143, 214-222.	6.6	17
87	X-ray emission spectroscopy with a laser-heated diamond anvil cell: a new experimental probe of the spin state of iron in the Earth's interior. Journal of Synchrotron Radiation, 2005, 12, 637-641.	1.0	16
88	Synchrotron Mossbauer spectroscopic study of ferropericlase at high pressures and temperatures. American Mineralogist, 2009, 94, 594-599.	0.9	16
89	High-pressure behavior of natural single-crystal epidote and clinozoisite up to 40 GPa. Physics and Chemistry of Minerals, 2016, 43, 649-659.	0.3	16
90	HyMaTZ: A Python Program for Modeling Seismic Velocities in Hydrous Regions of the Mantle Transition Zone. Geochemistry, Geophysics, Geosystems, 2018, 19, 2308-2324.	1.0	16

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91	Diamonds and the Mantle Geodynamics of Carbon. , 2019, , 89-128.		16
92	Elasticity of franklinite and trends for transition-metal oxide spinels. American Mineralogist, 2013, 98, 601-608.	0.9	15
93	Mechanisms of anomalous compressibility of vitreous silica. Physical Review B, 2014, 90, .	1.1	15
94	First-principles investigation of hydrous post-perovskite. Physics of the Earth and Planetary Interiors, 2015, 244, 42-48.	0.7	15
95	Exploring the High-Pressure Materials Genome. Physical Review X, 2018, 8, .	2.8	15
96	Crystal chemistry, thermal expansion, and Raman spectra of hydroxyl-clinohumite: implications for water in Earthâ€™s interior. Contributions To Mineralogy and Petrology, 2013, 165, 563-574.	1.2	14
97	Quantification of water in majoritic garnet. American Mineralogist, 2015, 100, 1084-1092.	0.9	14
98	Electronic Spin Transition of Iron in the Earth's Deep Mantle. Eos, 2007, 88, 13.	0.1	13
99	Water in Transition Zone and Lower Mantle Minerals. Geophysical Monograph Series, 0, , 57-68.	0.1	13
100	Highly volatile element (H, C, F, Cl, S) abundances and H isotopic compositions in chondrules from carbonaceous and ordinary chondrites. Geochimica Et Cosmochimica Acta, 2021, 301, 230-258.	1.6	13
101	Crystal structure, thermal expansivity, and elasticity of OH-chondrodite: trends among dense hydrous magnesium silicates. Contributions To Mineralogy and Petrology, 2015, 169, 1.	1.2	12
102	Thermal Equation of State of Natural Tiâ€Bearing Clinohumite. Journal of Geophysical Research: Solid Earth, 2017, 122, 8943-8951.	1.4	12
103	A gigahertz ultrasonic interferometer for the diamond anvil cell and high-pressure elasticity of some iron-oxide minerals. , 2005, , 25-48.		11
104	High-pressure discovery of Î²-NiBi. Chemical Communications, 2017, 53, 11241-11244.	2.2	11
105	Elastic and mechanical softening in boron-doped diamond. Scientific Reports, 2017, 7, 42921.	1.6	10
106	Single-crystal neutron diffraction and Raman spectroscopic study of hydroxylherderite, CaBePO4(OH,F). Mineralogical Magazine, 2014, 78, 723-737.	0.6	9
107	Impact of Pressure on Magnetic Order in Jarosite. Journal of the American Chemical Society, 2018, 140, 12001-12009.	6.6	9
108	High-pressure phase transitions of clinoenstatite. American Mineralogist, 2019, 104, 897-904.	0.9	9

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109	Fast identification of mineral inclusions in diamondÂat GSECARS using synchrotron X-ray microtomography, radiography and diffraction. Journal of Synchrotron Radiation, 2019, 26, 1763-1768.	1.0	9
110	Seismological Constraints on Earth's Deep Water Cycle. Geophysical Monograph Series, 0, , 13-27.	0.1	8
111	Stability, composition, and crystal structure of Fe-bearing Phase E in the transition zone. American Mineralogist, 2019, 104, 1620-1624.	0.9	8
112	Controlling Dimensionality in the Niâ€“Bi System with Pressure. Chemistry of Materials, 2019, 31, 955-959.	3.2	8
113	Structure determination by single-crystal X-ray diffraction (SXD) at megabar pressures. Journal of Synchrotron Radiation, 2005, 12, 547-548.	1.0	7
114	14. Effect of Water on the Equation of State of Nominally Anhydrous Minerals. , 2006, , 321-342.		7
115	Anelasticity of FexO at high pressure. Applied Physics Letters, 2008, 93, 034106.	1.5	7
116	Transition metals in the transition zone: Crystal chemistry of minor element substitution in wadsleyite. American Mineralogist, 2016, 101, 2322-2330.	0.9	7
117	Discovery of Cu 3 Pb. Angewandte Chemie - International Edition, 2018, 57, 12809-12813.	7.2	7
118	Goldschmidtite, (K,REE,Sr)(Nb,Cr)O3: A new perovskite supergroup mineral found in diamond from Koffiefontein, South Africa. American Mineralogist, 2019, 104, 1345-1350.	0.9	7
119	High-pressure synthesis of the <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mrow><mml:mi>BiV</mml:mi><mml:msub><mml:mi mathvariant="normal">O</mml:mi><mml:mn>3</mml:mn></mml:msub></mml:mrow></mml:math> perovskite. Physical Review Materials, 2019, 3, .	0.9	7
120	Crystal structure, Raman and FTIR spectroscopy, and equations of state of OH-bearing MgSiO3 akimotoite. Contributions To Mineralogy and Petrology, 2013, 166, 1375-1388.	1.2	6
121	High-pressure high-temperature Raman spectroscopy of kerogen: Relevance to subducted organic carbon. American Mineralogist, 2017, 102, 391-403.	0.9	6
122	MnBi2: A Metastable High-Pressure Phase in the Mnâ€“Bi System. Chemistry of Materials, 2019, 31, 3083-3088.	3.2	6
123	Powder neutron diffraction of wÃ¼stite (Fe0.93O) to 12ÂGPa using large moissanite anvils. High Pressure Research, 2004, 24, 247-253.	0.4	5
124	Correction to â€œSound velocities of ferropericlase in the Earth's lower mantleâ€• Geophysical Research Letters, 2007, 34, .	1.5	5
125	STRUCTURE AND CATION ORDER IN MANGANILVAITE: A COMBINED X-RAY-DIFFRACTION, NEUTRON-DIFFRACTION AND MOSSBAUER STUDY. Canadian Mineralogist, 2005, 43, 1043-1053.	0.3	4
126	Optical reflectivity of solid and liquid methane: Application to spectroscopy of Titan's hydrocarbon lakes. Geophysical Research Letters, 2012, 39, .	1.5	4

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127	Raman Spectroscopic Studies of Hydrous and Nominally Anhydrous Deep Mantle Phases. Geophysical Monograph Series, 0, , 69-93.	0.1	4
128	A gigahertz ultrasonic interferometer for the diamond anvil cell and high-pressure elasticity of some iron-oxide minerals. , 2005, .		4
129	Discovery of Cu 3 Pb. Angewandte Chemie, 2018, 130, 12991-12995.	1.6	3
130	Nixonite, Na2Ti6O13, a new mineral from a metasomatized mantle garnet pyroxenite from the western Rae Craton, Darby kimberlite field, Canada. American Mineralogist, 2019, 104, 1336-1344.	0.9	3
131	Pressure-Induced Collapse of Magnetic Order in Jarosite. Physical Review Letters, 2020, 125, 077202.	2.9	3
132	Transition metals in the transition zone: partitioning of Ni, Co, and Zn between olivine, wadsleyite, ringwoodite, and clinoenstatite. Contributions To Mineralogy and Petrology, 2018, 173, 1.	1.2	1
133	High-pressure crystal structure and equation of state of ferromagnesian jeffbenite: implications for stability in the transition zone and uppermost lower mantle. Contributions To Mineralogy and Petrology, 2021, 176, 1.	1.2	1
134	Synthesis of the Candidate Topological Compound Ni₃Pb₂. Journal of the American Chemical Society, 2022, 144, 11943-11948.	6.6	1
135	Thank You to Our 2018 Peer Reviewers. Geophysical Research Letters, 2019, 46, 12608-12636.	1.5	0
136	Pressure-induced dehydration of dioptase: A single-crystal X-ray diffraction and Raman spectroscopy study. Comptes Rendus - Geoscience, 2019, 351, 121-128.	0.4	0
137	Thank You to Our 2019 Peer Reviewers. Geophysical Research Letters, 2020, 47, e2020GL088048.	1.5	0
138	Thank You to Our 2020 Peer Reviewers. Geophysical Research Letters, 2021, 48, e2021GL093126.	1.5	0