

David Bercovici

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107 papers	5,254 citations	42 h-index	70 g-index
112 ext. papers	5,759 ext. citations	7.5 avg, IF	6.11 L-index

#	Paper	IF	Citations
107	Whole-mantle convection and the transition-zone water filter. <i>Nature</i> , 2003 , 425, 39-44	50.4	549
106	The generation of plate tectonics from mantle convection. <i>Earth and Planetary Science Letters</i> , 2003 , 205, 107-121	5.3	279
105	A two-phase model for compaction and damage: 1. General Theory. <i>Journal of Geophysical Research</i> , 2001 , 106, 8887-8906		221
104	Plate tectonics, damage and inheritance. <i>Nature</i> , 2014 , 508, 513-6	50.4	192
103	Three-Dimensional Spherical Models of Convection in the Earth's Mantle. <i>Science</i> , 1989 , 244, 950-5	33.3	154
102	Mantle shear-wave velocity structure beneath the Hawaiian hot spot. <i>Science</i> , 2009 , 326, 1388-90	33.3	153
101	Mechanisms for the generation of plate tectonics by two-phase grain-damage and pinning. <i>Physics of the Earth and Planetary Interiors</i> , 2012 , 202-203, 27-55	2.3	152
100	Energetics of a two-phase model of lithospheric damage, shear localization and plate-boundary formation. <i>Geophysical Journal International</i> , 2003 , 152, 581-596	2.6	116
99	A thermodynamically self-consistent damage equation for grain size evolution during dynamic recrystallization. <i>Geophysical Journal International</i> , 2011 , 184, 719-728	2.6	112
98	Generation of plate tectonics from lithosphere-mantle flow and void-volatile self-lubrication. <i>Earth and Planetary Science Letters</i> , 1998 , 154, 139-151	5.3	111
97	A simple model of plate generation from mantle flow. <i>Geophysical Journal International</i> , 1993 , 114, 635-650	50.4	105
96	A two-phase model for compaction and damage: 2. Applications to compaction, deformation, and the role of interfacial surface tension. <i>Journal of Geophysical Research</i> , 2001 , 106, 8907-8924		103
95	Double flood basalts and plume head separation at the 660-kilometer discontinuity. <i>Science</i> , 1994 , 266, 1367-9	33.3	100
94	The conditions for plate tectonics on super-Earths: Inferences from convection models with damage. <i>Earth and Planetary Science Letters</i> , 2012 , 331-332, 281-290	5.3	99
93	Interpolation with Splines in Tension: A Green's Function Approach. <i>Mathematical Geosciences</i> , 1998 , 30, 77-93		93
92	Three-dimensional thermal convection in a spherical shell. <i>Journal of Fluid Mechanics</i> , 1989 , 206, 75-104	3.7	85
91	Rock deformation models and fluid leak-off in hydraulic fracturing. <i>Geophysical Journal International</i> , 2013 , 194, 1514-1526	2.6	73

90	On the thermal and magnetic histories of Earth and Venus: Influences of melting, radioactivity, and conductivity. <i>Physics of the Earth and Planetary Interiors</i> , 2014 , 236, 36-51	2.3	72
89	The Relation Between Mantle Dynamics and Plate Tectonics: A Primer. <i>Geophysical Monograph Series</i> , 2000 , 5-46	1.1	72
88	A two-phase model for compaction and damage: 3. Applications to shear localization and plate boundary formation. <i>Journal of Geophysical Research</i> , 2001 , 106, 8925-8939		70
87	Tectonic plate generation and two-phase damage: Void growth versus grain size reduction. <i>Journal of Geophysical Research</i> , 2005 , 110,		68
86	Three-dimensional convection of an infinite-Prandtl-number compressible fluid in a basally heated spherical shell. <i>Journal of Fluid Mechanics</i> , 1992 , 239, 683	3.7	68
85	Generation of plate tectonics with two-phase grain-damage and pinning: Source-sink model and toroidal flow. <i>Earth and Planetary Science Letters</i> , 2013 , 365, 275-288	5.3	67
84	Seismic tremors and magma wagging during explosive volcanism. <i>Nature</i> , 2011 , 470, 522-5	50.4	67
83	A source-sink model of the generation of plate tectonics from non-Newtonian mantle flow. <i>Journal of Geophysical Research</i> , 1995 , 100, 2013-2030		67
82	Plate generation in a simple model of lithosphere-mantle flow with dynamic self-lubrication. <i>Earth and Planetary Science Letters</i> , 1996 , 144, 41-51	5.3	64
81	Disequilibrium melting of a two phase multicomponent mantle. <i>Geophysical Journal International</i> , 2011 , 184, 699-718	2.6	63
80	Role of grain boundaries in magma migration and storage. <i>Earth and Planetary Science Letters</i> , 2006 , 248, 735-749	5.3	62
79	Influence of heating mode on three-dimensional mantle convection. <i>Geophysical Research Letters</i> , 1989 , 16, 617-620	4.9	62
78	Discrete alternating hotspot islands formed by interaction of magma transport and lithospheric flexure. <i>Nature</i> , 1999 , 397, 604-607	50.4	61
77	Non-hotspot formation of volcanic chains: control of tectonic and flexural stresses on magma transport. <i>Earth and Planetary Science Letters</i> , 2000 , 181, 539-554	5.3	60
76	Mantle P-wave velocity structure beneath the Hawaiian hotspot. <i>Earth and Planetary Science Letters</i> , 2011 , 303, 267-280	5.3	58
75	Simultaneous melting and compaction in deformable two-phase media. <i>Geophysical Journal International</i> , 2007 , 168, 964-982	2.6	58
74	Variations in planetary convection via the effect of climate on damage. <i>Earth and Planetary Science Letters</i> , 2009 , 277, 29-37	5.3	53
73	Slab dehydration in the Earth's mantle transition zone. <i>Earth and Planetary Science Letters</i> , 2006 , 251, 156-167	5.3	53

72	Chaotic, subduction-like downflows in a spherical model of convection in the Earth's mantle. <i>Nature</i> , 1990 , 347, 274-277	50.4	53
71	Divergent evolution of Earth and Venus: Influence of degassing, tectonics, and magnetic fields. <i>Icarus</i> , 2013 , 226, 1447-1464	3.8	52
70	Water-induced convection in the Earth's mantle transition zone. <i>Journal of Geophysical Research</i> , 2009 , 114,		51
69	Initiation of plate tectonics from post-magma ocean thermochemical convection. <i>Journal of Geophysical Research: Solid Earth</i> , 2014 , 119, 8538-8561	3.6	48
68	Two-phase dynamics of volcanic eruptions: compaction, compression and the conditions for choking. <i>Geophysical Journal International</i> , 2010 , 182, 843-864	2.6	45
67	On the dynamics of a hydrous melt layer above the transition zone. <i>Journal of Geophysical Research</i> , 2007 , 112,		43
66	Eruption cyclicity at silicic volcanoes potentially caused by magmatic gas waves. <i>Nature Geoscience</i> , 2013 , 6, 856-860	18.3	42
65	On the equipartition of kinetic energy in plate tectonics. <i>Geophysical Research Letters</i> , 1991 , 18, 1751-1754	4.9	41
64	Two-phase damage theory and crustal rock failure: the theoretical void limit, and the prediction of experimental data. <i>Geophysical Journal International</i> , 2003 , 155, 1057-1064	2.6	40
63	Abrupt tectonics and rapid slab detachment with grain damage. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2015 , 112, 1287-91	11.5	39
62	Asymmetric shallow mantle structure beneath the Hawaiian Swell-evidence from Rayleigh waves recorded by the PLUME network. <i>Geophysical Journal International</i> , 2011 , 187, 1725-1742	2.6	38
61	Oscillating and stagnating plumes in the Earth's lower mantle. <i>Earth and Planetary Science Letters</i> , 2006 , 248, 90-105	5.3	37
60	Grain-damage hysteresis and plate tectonic states. <i>Physics of the Earth and Planetary Interiors</i> , 2016 , 253, 31-47	2.3	37
59	Ascent and compaction of gas rich magma and the effects of hysteretic permeability. <i>Earth and Planetary Science Letters</i> , 2009 , 282, 258-267	5.3	36
58	Plate generation and two-phase damage theory in a model of mantle convection. <i>Geophysical Journal International</i> , 2008 , 174, 1065-1080	2.6	36
57	The non-linear initiation of diapirs and plume heads. <i>Physics of the Earth and Planetary Interiors</i> , 1997 , 101, 119-130	2.3	34
56	A gravity current model of cooling mantle plume heads with temperature-dependent buoyancy and viscosity. <i>Journal of Geophysical Research</i> , 1996 , 101, 3291-3309		32
55	Scaling laws for convection with temperature-dependent viscosity and grain-damage. <i>Geophysical Journal International</i> , 2014 , 199, 580-603	2.6	30

54	Probing the Hawaiian Hot Spot With New Broadband Ocean Bottom Instruments. <i>Eos</i> , 2009 , 90, 362-363	1.5	30
53	Jovian seismology. <i>Icarus</i> , 1987 , 69, 557-565	3.8	30
52	Two-phase dynamics of volcanic eruptions: Particle size distribution and the conditions for choking. <i>Journal of Geophysical Research: Solid Earth</i> , 2015 , 120, 1503-1522	3.6	28
51	A theoretical model of hotspot volcanism: Control on volcanic spacing and patterns via magma dynamics and lithospheric stresses. <i>Journal of Geophysical Research</i> , 2001 , 106, 683-702		27
50	Pacific Plate motion and undulations in geoid and bathymetry. <i>Earth and Planetary Science Letters</i> , 1996 , 140, 53-66	5.3	27
49	Two-dimensional convection with a self-lubricating, simple-damage rheology. <i>Geophysical Journal International</i> , 2003 , 154, 783-800	2.6	26
48	Formation of lithospheric shear zones: Effect of temperature on two-phase grain damage. <i>Physics of the Earth and Planetary Interiors</i> , 2017 , 270, 195-212	2.3	25
47	Formation and structure of lithospheric shear zones with damage. <i>Physics of the Earth and Planetary Interiors</i> , 2009 , 175, 115-126	2.3	25
46	On the purpose of toroidal motion in a convecting mantle. <i>Geophysical Research Letters</i> , 1995 , 22, 3107-3110	4.0	25
45	Grain damage, phase mixing and plate-boundary formation. <i>Journal of Geodynamics</i> , 2017 , 108, 40-55	2.2	24
44	Phase transitions and convection in icy satellites. <i>Geophysical Research Letters</i> , 1986 , 13, 448-451	4.9	23
43	Collapse of passive margins by lithospheric damage and plunging grain size. <i>Earth and Planetary Science Letters</i> , 2018 , 484, 341-352	5.3	22
42	Slab rollback instability and supercontinent dispersal. <i>Geophysical Research Letters</i> , 2014 , 41, 6659-6666	4.9	22
41	A theoretical model of cooling viscous gravity currents with temperature-dependent viscosity. <i>Geophysical Research Letters</i> , 1994 , 21, 1177-1180	4.9	22
40	On the penetration of the 660 km phase change by mantle downflows. <i>Geophysical Research Letters</i> , 1993 , 20, 2599-2602	4.9	21
39	Mantle plume heads and the initiation of plate tectonic reorganizations. <i>Earth and Planetary Science Letters</i> , 1998 , 156, 195-207	5.3	20
38	The possible reflection of mantle discontinuities in Pacific geoid and bathymetry. <i>Geophysical Research Letters</i> , 1994 , 21, 1943-1946	4.9	18
37	A continuous plate-tectonic model using geophysical data to estimate plate-margin widths, with a seismicity-based example. <i>Geophysical Journal International</i> , 1998 , 133, 379-389	2.6	17

36	A continuous kinematic model of plate-tectonic motions. <i>Geophysical Journal International</i> , 1994 , 119, 595-610	2.6	17
35	The clustering of rising diapirs and plume heads. <i>Geophysical Research Letters</i> , 1997 , 24, 201-204	4.9	16
34	A Theoretical Model of Pattern Formation in Coral Reefs. <i>Ecosystems</i> , 2003 , 6, 0061-0074	3.9	16
33	The Generation of Plate Tectonics From Grains to Global Scales: A Brief Review. <i>Tectonics</i> , 2019 , 38, 4058-4076	4.5	12
32	Melt-band instabilities with two-phase damage. <i>Geophysical Journal International</i> , 2015 , 201, 640-651	2.6	11
31	Two-phase damage models of magma-fracturing. <i>Earth and Planetary Science Letters</i> , 2013 , 368, 1-8	5.3	11
30	The Transition-Zone Water Filter Model for Global Material Circulation: Where Do We Stand?. <i>Geophysical Monograph Series</i> , 2013 , 289-313	1.1	10
29	Volcanic tremors and magma wagging: gas flux interactions and forcing mechanism. <i>Geophysical Journal International</i> , 2013 , 195, 1001-1022	2.6	10
28	Stability of a compressible hydrous melt layer above the transition zone. <i>Earth and Planetary Science Letters</i> , 2009 , 278, 78-86	5.3	10
27	Contraction or expansion of the Moon's crust during magma ocean freezing?. <i>Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences</i> , 2014 , 372, 20130240	3	9
26	The influence of the transition zone water filter on convective circulation in the mantle. <i>Geophysical Research Letters</i> , 2004 , 31,	4.9	9
25	Pattern formation on the interface of a two-layer fluid: bi-viscous lower layer. <i>Wave Motion</i> , 2001 , 34, 431-452	1.8	9
24	Mineral carbon sequestration and induced seismicity. <i>Geophysical Research Letters</i> , 2013 , 40, 814-818	4.9	8
23	Reactive infiltration of hydrous melt above the mantle transition zone. <i>Journal of Geophysical Research</i> , 2010 , 115,		8
22	Focusing of eruptions by fracture wall erosion. <i>Geophysical Research Letters</i> , 2001 , 28, 1823-1826	4.9	7
21	Modal growth and coupling in three-dimensional spherical convection. <i>Geophysical and Astrophysical Fluid Dynamics</i> , 1991 , 61, 149-159	1.4	7
20	A theoretical model for the evolution of microstructure in lithospheric shear zones. <i>Geophysical Journal International</i> , 2019 , 216, 803-819	2.6	7
19	Thermal evolution of planetesimals during accretion. <i>Icarus</i> , 2017 , 285, 103-117	3.8	6

18	A model for the spreading and compaction of two-phase viscous gravity currents. <i>Journal of Fluid Mechanics</i> , 2009 , 630, 299-329	3.7	6
17	A simple toy model for coupled retreat and detachment of subducting slabs. <i>Journal of Geodynamics</i> , 2019 , 129, 275-289	2.2	6
16	Evolution and demise of passive margins through grain mixing and damage. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2021 , 118,	11.5	6
15	A continuum theory for phase mixing and grain-damage relevant to tectonic plate boundary evolution. <i>Physics of the Earth and Planetary Interiors</i> , 2018 , 285, 23-44	2.3	6
14	Dynamic weakening with grain-damage and implications for slab detachment. <i>Physics of the Earth and Planetary Interiors</i> , 2018 , 285, 76-90	2.3	6
13	Two-dimensional magmons with damage and the transition to magma-fracturing. <i>Physics of the Earth and Planetary Interiors</i> , 2016 , 256, 13-25	2.3	5
12	13. Theoretical Analysis of Shear Localization in the Lithosphere 2002 , 387-420		5
11	Drip instabilities of continental lithosphere: acceleration and entrainment by damage. <i>Geophysical Journal International</i> , 2012 , 189, 717-729	2.6	4
10	A mechanism for mode selection in melt band instabilities. <i>Earth and Planetary Science Letters</i> , 2016 , 433, 139-145	5.3	3
9	Two-phase viscoelastic damage theory, with applications to subsurface fluid injection. <i>Geophysical Journal International</i> , 2014 , 199, 1481-1496	2.6	3
8	Wave dynamics in mantle plume heads and hotspot swells. <i>Geophysical Research Letters</i> , 1992 , 19, 1791-1794	1.9	3
7	A Two-Phase Model for the Evolution of Planetary Embryos With Implications for the Formation of Mars. <i>Journal of Geophysical Research E: Planets</i> , 2021 , 126, e2020JE006754	4.1	2
6	Magma wagging and whirling in volcanic conduits. <i>Journal of Volcanology and Geothermal Research</i> , 2018 , 351, 57-74	2.8	1
5	Two-phase magnetohydrodynamics: Theory and applications to planetesimal cores. <i>Physics of the Earth and Planetary Interiors</i> , 2020 , 300, 106432	2.3	1
4	On the co-evolution of dislocations and grains in deforming rocks. <i>Physics of the Earth and Planetary Interiors</i> , 2022 , 106874	2.3	1
3	Thermocapillary effects in two-phase medium and applications to metal-silicate separation. <i>Physics of the Earth and Planetary Interiors</i> , 2021 , 311, 106640	2.3	0
2	Magma wagging and whirling: excitation by gas flux. <i>Geophysical Journal International</i> , 2018 , 215, 713-735	3.6	0
1	The Effects of Degassing on Magmatic Gas Waves and Long Period Eruptive Precursors at Silicic Volcanoes. <i>Journal of Geophysical Research: Solid Earth</i> , 2020 , 125, e2020JB019755	3.6	

