

Rajdeep Dasgupta

List of Publications by Year in descending order

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103
papers

9,217
citations

47006

47
h-index

39675

94
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107
all docs

107
docs citations

107
times ranked

4434
citing authors

#	ARTICLE	IF	CITATIONS
1	The deep carbon cycle and melting in Earth's interior. <i>Earth and Planetary Science Letters</i> , 2010, 298, 1-13.	4.4	772
2	Partial Melting Experiments of Peridotite + CO ₂ at 3 GPa and Genesis of Alkalic Ocean Island Basalts. <i>Journal of Petrology</i> , 2007, 48, 2093-2124.	2.8	508
3	Copper Systematics in Arc Magmas and Implications for Crust-Mantle Differentiation. <i>Science</i> , 2012, 336, 64-68.	12.6	480
4	Melting in the Earth's deep upper mantle caused by carbon dioxide. <i>Nature</i> , 2006, 440, 659-662.	27.8	462
5	Deep global cycling of carbon constrained by the solidus of anhydrous, carbonated eclogite under upper mantle conditions. <i>Earth and Planetary Science Letters</i> , 2004, 227, 73-85.	4.4	395
6	Ingassing, Storage, and Outgassing of Terrestrial Carbon through Geologic Time. <i>Reviews in Mineralogy and Geochemistry</i> , 2013, 75, 183-229.	4.8	302
7	Carbon-dioxide-rich silicate melt in the Earth's upper mantle. <i>Nature</i> , 2013, 493, 211-215.	27.8	290
8	Immiscible Transition from Carbonate-rich to Silicate-rich Melts in the 3 GPa Melting Interval of Eclogite + CO ₂ and Genesis of Silica-undersaturated Ocean Island Lavas. <i>Journal of Petrology</i> , 2006, 47, 647-671.	2.8	257
9	Compositions of HIMU, EM1, and EM2 from global trends between radiogenic isotopes and major elements in ocean island basalts. <i>Earth and Planetary Science Letters</i> , 2008, 276, 175-186.	4.4	256
10	The redox state of arc mantle using Zn/Fe systematics. <i>Nature</i> , 2010, 468, 681-685.	27.8	232
11	Trace element partitioning between garnet lherzolite and carbonatite at 6.6 and 8.6 GPa with applications to the geochemistry of the mantle and of mantle-derived melts. <i>Chemical Geology</i> , 2009, 262, 57-77.	3.3	231
12	Melting in the Fe-C system to 70 GPa. <i>Earth and Planetary Science Letters</i> , 2009, 284, 157-167.	4.4	216
13	Mineralogical heterogeneities in the Earth's mantle: Constraints from Mn, Co, Ni and Zn partitioning during partial melting. <i>Earth and Planetary Science Letters</i> , 2011, 307, 395-408.	4.4	194
14	Reaction between MORB-eclogite derived melts and fertile peridotite and generation of ocean island basalts. <i>Earth and Planetary Science Letters</i> , 2012, 329-330, 97-108.	4.4	194
15	Major element chemistry of ocean island basalts – Conditions of mantle melting and heterogeneity of mantle source. <i>Earth and Planetary Science Letters</i> , 2010, 289, 377-392.	4.4	166
16	The H/C ratios of Earth's near-surface and deep reservoirs, and consequences for deep Earth volatile cycles. <i>Chemical Geology</i> , 2009, 262, 4-16.	3.3	160
17	Upside-down differentiation and generation of a primordial lower mantle. <i>Nature</i> , 2010, 463, 930-933.	27.8	149
18	Continental arc-island arc fluctuations, growth of crustal carbonates, and long-term climate change. , 2013, 9, 21-36.		134

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19	Carbon solution and partitioning between metallic and silicate melts in a shallow magma ocean: Implications for the origin and distribution of terrestrial carbon. <i>Geochimica Et Cosmochimica Acta</i> , 2013, 102, 191-212.	3.9	129
20	Fe ²⁺ -Mg partitioning between olivine and basaltic melts: Applications to genesis of olivine-phyric shergottites and conditions of melting in the Martian interior. <i>Earth and Planetary Science Letters</i> , 2011, 304, 527-537.	4.4	126
21	Effect of variable carbonate concentration on the solidus of mantle peridotite. <i>American Mineralogist</i> , 2007, 92, 370-379.	1.9	121
22	The effect of bulk composition on the solidus of carbonated eclogite from partial melting experiments at 3 ÅPa. <i>Contributions To Mineralogy and Petrology</i> , 2005, 149, 288-305.	3.1	119
23	High-pressure melting relations in Fe-C-S systems: Implications for formation, evolution, and structure of metallic cores in planetary bodies. <i>Geochimica Et Cosmochimica Acta</i> , 2009, 73, 6678-6691.	3.9	115
24	Carbonate-fluxed Melting of MORB-like Pyroxenite at 9 GPa and Genesis of HIMU Ocean Island Basalts. <i>Journal of Petrology</i> , 2010, 51, 2067-2088.	2.8	114
25	Melting phase relation of nominally anhydrous, carbonated pelitic-eclogite at 2.5-3.0 ÅPa and deep cycling of sedimentary carbon. <i>Contributions To Mineralogy and Petrology</i> , 2011, 161, 743-763.	3.1	114
26	Reactive Infiltration of MORB-Eclogite-Derived Carbonated Silicate Melt into Fertile Peridotite at 3 GPa and Genesis of Alkalic Magmas. <i>Journal of Petrology</i> , 2013, 54, 2267-2300.	2.8	113
27	Carbon solubility in core melts in a shallow magma ocean environment and distribution of carbon between the Earth's core and the mantle. <i>Geochimica Et Cosmochimica Acta</i> , 2008, 72, 4627-4641.	3.9	107
28	Water follows carbon: CO ₂ incites deep silicate melting and dehydration beneath mid-ocean ridges. <i>Geology</i> , 2007, 35, 135.	4.4	102
29	Partial melting of fertile peridotite fluxed by hydrous rhyolitic melt at 2-3 GPa: implications for mantle wedge hybridization by sediment melt and generation of ultrapotassic magmas in convergent margins. <i>Contributions To Mineralogy and Petrology</i> , 2015, 169, 1.	3.1	97
30	Rise of Earth's atmospheric oxygen controlled by efficient subduction of organic carbon. <i>Nature Geoscience</i> , 2017, 10, 387-392.	12.9	95
31	Partitioning of carbon between Fe-rich alloy melt and silicate melt in a magma ocean - Implications for the abundance and origin of volatiles in Earth, Mars, and the Moon. <i>Geochimica Et Cosmochimica Acta</i> , 2014, 139, 447-471.	3.9	92
32	A modified iterative sandwich method for determination of near-solidus partial melt compositions. II. Application to determination of near-solidus melt compositions of carbonated peridotite. <i>Contributions To Mineralogy and Petrology</i> , 2007, 154, 647-661.	3.1	89
33	Effect of variable CO ₂ on eclogite-derived andesite and lherzolite reaction at 3 GPa-Implications for mantle source characteristics of alkalic ocean island basalts. <i>Geochemistry, Geophysics, Geosystems</i> , 2014, 15, 1533-1557.	2.5	78
34	Carbon and sulfur budget of the silicate Earth explained by accretion of differentiated planetary embryos. <i>Nature Geoscience</i> , 2016, 9, 781-785.	12.9	75
35	Fluid-present melting of sulfide-bearing ocean-crust: Experimental constraints on the transport of sulfur from subducting slab to mantle wedge. <i>Geochimica Et Cosmochimica Acta</i> , 2013, 110, 106-134.	3.9	74
36	Delivery of carbon, nitrogen, and sulfur to the silicate Earth by a giant impact. <i>Science Advances</i> , 2019, 5, eaau3669.	10.3	74

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37	The effect of carbonates on near-solidus melting of pelite at 3GPa: Relative efficiency of H ₂ O and CO ₂ subduction. <i>Earth and Planetary Science Letters</i> , 2012, 319-320, 185-196.	4.4	73
38	The Fate of Sulfur During Fluid-Present Melting of Subducting Basaltic Crust at Variable Oxygen Fugacity. <i>Journal of Petrology</i> , 2014, 55, 1019-1050.	2.8	73
39	The effects of sulfur, silicon, water, and oxygen fugacity on carbon solubility and partitioning in Fe-rich alloy and silicate melt systems at 3 GPa and 1600°C: Implications for core-mantle differentiation and degassing of magma oceans and reduced planetary mantles. <i>Earth and Planetary Science Letters</i> , 2015, 415, 54-66.	4.4	68
40	Effects of water, depth and temperature on partial melting of mantle-wedge fluxed by hydrous sediment-melt in subduction zones. <i>Geochimica Et Cosmochimica Acta</i> , 2016, 195, 226-243.	3.9	68
41	Flux of carbonate melt from deeply subducted pelitic sediments: Geophysical and geochemical implications for the source of Central American volcanic arc. <i>Geophysical Research Letters</i> , 2012, 39, .	4.0	62
42	Slab-mantle interaction, carbon transport, and kimberlite generation in the deep upper mantle. <i>Earth and Planetary Science Letters</i> , 2019, 506, 38-52.	4.4	61
43	Compressibility change in iron-rich melt and implications for core formation models. <i>Earth and Planetary Science Letters</i> , 2011, 306, 118-122.	4.4	56
44	Sulfur concentration of martian basalts at sulfide saturation at high pressures and temperatures – Implications for deep sulfur cycle on Mars. <i>Geochimica Et Cosmochimica Acta</i> , 2014, 131, 227-246.	3.9	55
45	Volatile-bearing partial melts beneath oceans and continents – Where, how much, and of what compositions?. <i>Numerische Mathematik</i> , 2018, 318, 141-165.	1.4	54
46	Great Oxidation and Lomagundi events linked by deep cycling and enhanced degassing of carbon. <i>Nature Geoscience</i> , 2020, 13, 71-76.	12.9	54
47	Fe-Ni-Cu-S phase relations at high pressures and temperatures – The role of sulfur in carbon storage and diamond stability at mid- to deep-upper mantle. <i>Earth and Planetary Science Letters</i> , 2015, 412, 132-142.	4.4	52
48	CO ₂ solubility and speciation in rhyolitic sediment partial melts at 1.5–3.0GPa – Implications for carbon flux in subduction zones. <i>Geochimica Et Cosmochimica Acta</i> , 2014, 124, 328-347.	3.9	51
49	Recommended mineral-melt partition coefficients for FRTEs (Cu), Ga, and Ge during mantle melting. <i>American Mineralogist</i> , 2015, 100, 2533-2544.	1.9	45
50	The fate of sulfide during decompression melting of peridotite – implications for sulfur inventory of the MORB-source depleted upper mantle. <i>Earth and Planetary Science Letters</i> , 2017, 459, 183-195.	4.4	44
51	Planetesimal rings as the cause of the Solar System’s planetary architecture. <i>Nature Astronomy</i> , 2022, 6, 357-366.	10.1	43
52	Constraints on the depth and thermal vigor of melting in the Martian mantle. <i>Journal of Geophysical Research E: Planets</i> , 2015, 120, 109-122.	3.6	42
53	Effect of melt composition on crustal carbonate assimilation: Implications for the transition from calcite consumption to skarnification and associated CO ₂ degassing. <i>Geochemistry, Geophysics, Geosystems</i> , 2016, 17, 3893-3916.	2.5	39
54	Core-mantle fractionation of carbon in Earth and Mars: The effects of sulfur. <i>Geochimica Et Cosmochimica Acta</i> , 2018, 238, 477-495.	3.9	38

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55	High pressure, near-liquidus phase equilibria of the Home Plate basalt Fastball and melting in the Martian mantle. <i>Geophysical Research Letters</i> , 2010, 37, .	4.0	37
56	Effect of fluorine on near-liquidus phase equilibria of an Fe-Mg rich basalt. <i>Chemical Geology</i> , 2012, 312-313, 118-126.	3.3	37
57	Nonstoichiometry and growth of some Fe carbides. <i>Contributions To Mineralogy and Petrology</i> , 2013, 166, 935-957.	3.1	37
58	Hydrous basalt-limestone interaction at crustal conditions: Implications for generation of ultracalcic melts and outflux of CO ₂ at volcanic arcs. <i>Earth and Planetary Science Letters</i> , 2015, 427, 202-214.	4.4	37
59	The speciation of carbon, nitrogen, and water in magma oceans and its effect on volatile partitioning between major reservoirs of the Solar System rocky bodies. <i>Geochimica Et Cosmochimica Acta</i> , 2020, 280, 281-301.	3.9	37
60	New bulk sulfur measurements of Martian meteorites and modeling the fate of sulfur during melting and crystallization – Implications for sulfur transfer from Martian mantle to crust-atmosphere system. <i>Earth and Planetary Science Letters</i> , 2015, 409, 157-167.	4.4	36
61	New high pressure experiments on sulfide saturation of high-FeO – basalts with variable TiO ₂ contents – Implications for the sulfur inventory of the lunar interior. <i>Geochimica Et Cosmochimica Acta</i> , 2018, 222, 319-339.	3.9	36
62	The fate of nitrogen during core-mantle separation on Earth. <i>Geochimica Et Cosmochimica Acta</i> , 2019, 251, 87-115.	3.9	34
63	A very early origin of isotopically distinct nitrogen in inner Solar System protoplanets. <i>Nature Astronomy</i> , 2021, 5, 356-364.	10.1	34
64	Carbon contents in reduced basalts at graphite saturation: Implications for the degassing of Mars, Mercury, and the Moon. <i>Journal of Geophysical Research E: Planets</i> , 2017, 122, 1300-1320.	3.6	32
65	High Pressure Phase Relations of a Depleted Peridotite Fluxed by CO ₂ – Bearing Siliceous Melts and the Origin of Mid-Lithospheric Discontinuity. <i>Geochemistry, Geophysics, Geosystems</i> , 2018, 19, 595-620.	2.5	30
66	A Framework for Understanding Whole-Earth Carbon Cycling. , 2019, , 313-357.		30
67	Experimental determination of CO ₂ content at graphite saturation along a natural basalt-peridotite melt join: Implications for the fate of carbon in terrestrial magma oceans. <i>Earth and Planetary Science Letters</i> , 2017, 466, 115-128.	4.4	29
68	Effect of sulfate on the basaltic liquidus and Sulfur Concentration at Anhydrite Saturation (SCAS) of hydrous basalts – Implications for sulfur cycle in subduction zones. <i>Chemical Geology</i> , 2019, 522, 162-174.	3.3	25
69	Thermobarometry of CO ₂ -rich, silica-undersaturated melts constrains cratonic lithosphere thinning through time in areas of kimberlitic magmatism. <i>Earth and Planetary Science Letters</i> , 2020, 550, 116549.	4.4	25
70	Rates of protoplanetary accretion and differentiation set nitrogen budget of rocky planets. <i>Nature Geoscience</i> , 2021, 14, 369-376.	12.9	25
71	An upper limit on late accretion and water delivery in the TRAPPIST-1 exoplanet system. <i>Nature Astronomy</i> , 2022, 6, 80-88.	10.1	25
72	A CO ₂ solubility model for silicate melts from fluid saturation to graphite or diamond saturation. <i>Chemical Geology</i> , 2018, 487, 23-38.	3.3	24

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73	Decarbonation in the Ca-Mg-Fe carbonate system at mid-crustal pressure as a function of temperature and assimilation with arc magmas – Implications for long-term climate. <i>Chemical Geology</i> , 2018, 492, 30-48.	3.3	24
74	Assessing the presence of volatile-bearing mineral phases in the cratonic mantle as a possible cause of mid-lithospheric discontinuities. <i>Earth and Planetary Science Letters</i> , 2021, 553, 116602.	4.4	24
75	Sulfur extraction via carbonated melts from sulfide-bearing mantle lithologies – Implications for deep sulfur cycle and mantle redox. <i>Geochimica Et Cosmochimica Acta</i> , 2020, 269, 376-397.	3.9	23
76	The Effect of a Strong Pressure Bump in the Sun’s Natal Disk: Terrestrial Planet Formation via Planetesimal Accretion Rather than Pebble Accretion. <i>Astrophysical Journal</i> , 2021, 915, 62.	4.5	23
77	Sulfur Inventory of Ocean Island Basalt Source Regions Constrained by Modeling the Fate of Sulfide during Decompression Melting of a Heterogeneous Mantle. <i>Journal of Petrology</i> , 2018, 59, 1281-1308.	2.8	22
78	Partial melting of a depleted peridotite metasomatized by a MORB-derived hydrous silicate melt – Implications for subduction zone magmatism. <i>Geochimica Et Cosmochimica Acta</i> , 2020, 290, 137-161.	3.9	22
79	Siderophile element partitioning between cohenite and liquid in the Fe–Ni–S–C system and implications for geochemistry of planetary cores and mantles. <i>Geochimica Et Cosmochimica Acta</i> , 2013, 120, 239-250.	3.9	20
80	Phase Relations of a Depleted Peridotite Fluxed by a CO ₂ –CH ₂ O Fluid – Implications for the Stability of Partial Melts Versus Volatile-Bearing Mineral Phases in the Cratonic Mantle. <i>Journal of Geophysical Research: Solid Earth</i> , 2019, 124, 10089-10106.	3.4	20
81	Origin and Early Differentiation of Carbon and Associated Life-Essential Volatile Elements on Earth. , 2019, , 4-39.		20
82	Constraining Ancient Magmatic Evolution on Mars Using Crystal Chemistry of Detrital Igneous Minerals in the Sedimentary Bradbury Group, Gale Crater, Mars. <i>Journal of Geophysical Research E: Planets</i> , 2020, 125, e2020JE006467.	3.6	20
83	CO ₂ content of andesitic melts at graphite-saturated upper mantle conditions with implications for redox state of oceanic basalt source regions and remobilization of reduced carbon from subducted eclogite. <i>Contributions To Mineralogy and Petrology</i> , 2017, 172, 1.	3.1	19
84	Effect of chlorine on near-liquidus phase equilibria of an Fe–Mg-rich tholeiitic basalt. <i>Contributions To Mineralogy and Petrology</i> , 2014, 168, 1.	3.1	18
85	Pressure and temperature dependence of CO ₂ solubility in hydrous rhyolitic melt: implications for carbon transfer to mantle source of volcanic arcs via partial melt of subducting crustal lithologies. <i>Contributions To Mineralogy and Petrology</i> , 2015, 169, 1.	3.1	18
86	A modified iterative sandwich method for determination of near-solidus partial melt compositions. I. Theoretical considerations. <i>Contributions To Mineralogy and Petrology</i> , 2007, 154, 635-645.	3.1	16
87	Oceanic lavas sampling the high- ³ He/ ⁴ He mantle reservoir: Primitive, depleted, or re-enriched?. <i>American Mineralogist</i> , 2015, 100, 2066-2081.	1.9	14
88	The influence of plate tectonic style on melt production and CO ₂ outgassing flux at mid-ocean ridges. <i>Earth and Planetary Science Letters</i> , 2019, 511, 154-163.	4.4	14
89	Redox state of the convective mantle from CO ₂ -trace element systematics of oceanic basalts. <i>Geochemical Perspectives Letters</i> , 0, , 17-21.	5.0	14
90	Improving the reliability of Fe- and S-XANES measurements in silicate glasses: Correcting beam damage and identifying Fe-oxide nanolites in hydrous and anhydrous melt inclusions. <i>Chemical Geology</i> , 2021, 586, 120610.	3.3	14

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91	The contribution to exogenic CO ₂ by contact metamorphism at continental arcs: A coupled model of fluid flux and metamorphic decarbonation. <i>Numerische Mathematik</i> , 2019, 319, 631-657.	1.4	12
92	Volatile-bearing Partial Melts in the Lithospheric and Sub-Lithospheric Mantle on Earth and Other Rocky Planets. <i>Reviews in Mineralogy and Geochemistry</i> , 2022, 87, 575-606.	4.8	12
93	Nitrogen Content in the Earth's Outer Core. <i>Geophysical Research Letters</i> , 2019, 46, 89-98.	4.0	10
94	The effect of carbon concentration on its core-mantle partitioning behavior in inner Solar System rocky bodies. <i>Earth and Planetary Science Letters</i> , 2021, 571, 117090.	4.4	10
95	The Solidus and Melt Productivity of Nominally Anhydrous Martian Mantle Constrained by New High Pressure-Temperature Experiments—Implications for Crustal Production and Mantle Source Evolution. <i>Journal of Geophysical Research E: Planets</i> , 2020, 125, e2019JE006078.	3.6	7
96	Oxygen fugacity range of subducting crust inferred from fractionation of trace elements during fluid-present slab melting in the presence of anhydrite versus sulfide. <i>Geochimica Et Cosmochimica Acta</i> , 2022, 325, 214-231.	3.9	7
97	Partitioning of chalcophile and highly siderophile elements (HSEs) between sulfide and carbonated melts – Implications for HSE systematics of kimberlites, carbonatites, and melt metasomatized mantle domains. <i>Geochimica Et Cosmochimica Acta</i> , 2021, 305, 130-147.	3.9	6
98	Earth's core could be the largest terrestrial carbon reservoir. <i>Communications Earth & Environment</i> , 2021, 2, .	6.8	6
99	Carbon recycling efficiency in subduction zones constrained by the effects of H ₂ O-CO ₂ fluids on partial melt compositions in the mantle wedge. <i>Earth and Planetary Science Letters</i> , 2022, 588, 117578.	4.4	6
100	Introduction to Deep Carbon: Past to Present. , 2019, , 1-3.		2
101	The Link between the Physical and Chemical Properties of Carbon-Bearing Melts and Their Application for Geophysical Imaging of Earth's Mantle. , 2019, , 163-187.		1
102	Continental - island arc fluctuations through time and the Eocene transition from a greenhouse to an icehouse world. <i>Rendiconti Online Societa Geologica Italiana</i> , 0, 31, 62-63.	0.3	1
103	Effects of phosphorus on partial melting of the Martian Mantle and compositions of the Martian Crust. <i>Geochimica Et Cosmochimica Acta</i> , 2022, 327, 229-246.	3.9	0