Naduvalath Balakrishnan

List of Publications by Year
in descending order

115 papers	4,200 citations	101543 36 h-index	128289 60 g-index
118 all docs	118 docs citations	118 times ranked	2202 citing authors

#	Article	IF	Citations
1	ROTATIONAL QUENCHING OF CO DUE TO H₂COLLISIONS. Astrophysical Journal, 2010, 718, 1062-1069.	4.5	299
2	Time-dependent quantum mechanical approach to reactive scattering and related processes. Physics Reports, 1997, 280, 79-144.	25.6	236
3	Chemistry at ultracold temperatures. Chemical Physics Letters, 2001, 341, 652-656.	2.6	229
4	Perspective: Ultracold molecules and the dawn of cold controlled chemistry. Journal of Chemical Physics, 2016, 145, 150901.	3.0	204
5	Quenching ofH2Vibrations in Ultracold3Heand4HeCollisions. Physical Review Letters, 1998, 80, 3224-3227.	7.8	157
6	Complex scattering lengths in multi-channel atomâ€“molecule collisions. Chemical Physics Letters, 1997, 280, 5-9.	2.6	123
7	Vibrational relaxation of CO by collisions with 4He at ultracold temperatures. Journal of Chemical Physics, 2000, 113, 621-627.	3.0	101
8	Importance of long-range interactions in chemical reactions at cold and ultracold temperatures. International Reviews in Physical Chemistry, 2006, 25, 283-311.	2.3	89
9	Computational study of hydrogen storage in organometallic compounds. Journal of Chemical Physics, 2007, 126, 094703.	3.0	89
10	Quasiresonant Energy Transfer in Ultracold Atom-Diatom Collisions. Physical Review Letters, 1999, 82, 2657-2660.	7.8	83
11	Threshold phenomena in ultracold atomâ€“molecule collisions. Chemical Physics Letters, 1997, 280, 1-4.	2.6	79
12	The Heâ€“CaH([sup 2]Î£[sup +]) interaction. II. Collisions at cold and ultracold temperatures. Journal of Chemical Physics, 2003, 118, 7386.	3.0	75
13	Chemical reactions in the limit of zero kinetic energy: virtual states and Ramsauer minima inF + H2ÂHF + H. Journal of Physics B: Atomic, Molecular and Optical Physics, 2004, 37, 3641-3648.	1.5	75
14	The geometric phase controls ultracold chemistry. Nature Communications, 2015, 6, 7918.	12.8	70
15	Spin-flipping transitions in2Î£molecules induced by collisions with structureless atoms. Physical Review A, 2003, 67, .	2.5	65
16	Quantum dynamics of COâ€“H2 in full dimensionality. Nature Communications, 2015, 6, 6629.	12.8	61
17	Evolution of Small Ti Clusters and the Dissociative Chemisorption of H2on Ti. Journal of Physical Chemistry C, 2007, 111, 7494-7500.	3.1	59
18	Universality and chaoticity in ultracold K+KRb chemical reactions. Nature Communications, 2017, 8, 15897.	12.8	56

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19	Quantum calculations of H2â€“H2 collisions: From ultracold to thermal energies. Journal of Chemical Physics, 2009, 130, 114303.	3.0	54
20	Vibrational relaxation of trapped molecules. Physical Review A, 1999, 59, 2146-2152.	2.5	53
21	Geometric Phase Appears in the Ultracold Hydrogen Exchange Reaction. Physical Review Letters, 2015, 115, 153201.	7.8	52
22	Vibrational energy transfer in ultracold molecule-molecule collisions. Physical Review A, 2008, 77, .	2.5	51
23	Quantum dynamics of rovibrational transitions in H2-H2 collisions: Internal energy and rotational angular momentum conservation effects. Journal of Chemical Physics, 2011, 134, 214303.	3.0	51
24	Quantumâ€Mechanical Study of Rotational and Vibrational Transitions in CO Induced by H Atoms. Astrophysical Journal, 2002, 568, 443-447.	4.5	50
25	On the role of van der Waals interaction in chemical reactions at low temperatures. Journal of Chemical Physics, 2004, 121, 5563-5566.	3.0	48
26	State-to-state rotational transitions in H2+H2 collisions at low temperatures. Journal of Chemical Physics, 2006, 125, 114302.	3.0	47
27	First principles study of small palladium cluster growth and isomerization. International Journal of Quantum Chemistry, 2007, 107, 1632-1641.	2.0	45
28	Full-dimensional quantum dynamics calculations of H2â€“H2 collisions. Journal of Chemical Physics, 2011, 134, 014301.	3.0	40
29	Vibration-vibration and vibration-translation energy transfer in H2-H2 collisions: A critical test of experiment with full-dimensional quantum dynamics. Journal of Chemical Physics, 2013, 138, 104302.	3.0	40
30	Quantum mechanical investigation of the O+H2â†'OH+H reaction. Journal of Chemical Physics, 2003, 119, 195-199.	3.0	39
31	Unraveling the Stereodynamics of Cold Controlled <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:mi>HD</mml:mi><mml:mtext>â"'</mml:mtext><mml:msub><mml:mrow><mml:mi mathvariant="normal">H</mml:mi></mml:mrow><mml:mrow><mml:mn>2</mml:mn></mml:mrow></mml:msub></mml:mrow></mml:math> Collisions. Physical Review Letters, 2018, 121, 113401.	7.8	39
32	On the Quenching of Rovibrationally Excited Molecular Oxygen at Ultracold Temperaturesâ€. Journal of Physical Chemistry A, 2001, 105, 2348-2351.	2.5	38
33	Quantum calculations of the O(3P)+H2â†'OH+H reaction. Journal of Chemical Physics, 2004, 121, 6346-6352.	3.0	38
34	Quantum dynamics of the Li+HFâ†'H+LiF reaction at ultralow temperatures. Journal of Chemical Physics, 2005, 122, 154309.	3.0	38
35	On the Isotope Effect in F + HD Reaction at Ultracold Temperatures. Journal of Physical Chemistry A, 2003, 107, 7101-7105.	2.5	37
36	Quantum dynamics of the O+OHâ†'H+O2 reaction at low temperatures. Journal of Chemical Physics, 2008, 129, 224309.	3.0	36

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37	Cold and ultracold chemical reactions of F+HCl and F+DCl. Journal of Chemical Physics, 2008, 128, 224304.	3.0	36
38	QUANTUM CALCULATION OF INELASTIC CO COLLISIONS WITH H. I. ROTATIONAL QUENCHING OF LOW-LYING ROTATIONAL LEVELS. Astrophysical Journal, 2013, 771, 49.	4.5	34
39	Chemistry of Hydrogen Fluoride in the Interstellar Medium. Astrophysical Journal, 2002, 577, 795-797.	4.5	33
40	Full-dimensional quantum dynamics of CO in collision with H2. Journal of Chemical Physics, 2016, 145, 034308.	3.0	32
41	Stereodynamical Control of a Quantum Scattering Resonance in Cold Molecular Collisions. Physical Review Letters, 2019, 123, 043401.	7.8	32
42	Low energy H+CO scattering revisited. Astronomy and Astrophysics, 2007, 475, L15-L18.	5.1	30
43	Formation of molecular oxygen in ultracold<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:mi mathvariant="normal">O</mml:mi><mml:mo>+</mml:mo><mml:mi mathvariant="normal">O</mml:mi><mml:mi mathvariant="normal">H</mml:mi></mml:mrow></mml:math>collisions. Physical Review A, 2009, 79, .	2.5	30
44	Ultracold chemistry with alkali-metalâ€“rare-earth molecules. Physical Review A, 2015, 91, .	2.5	29
45	Nature of Hydrogen Interaction and Saturation on Small Titanium Clusters. Journal of Physical Chemistry A, 2008, 112, 2846-2854.	2.5	28
46	Rotational Quenching Rate Coefficients for H₂in Collisions with H₂from 2 to 10,000 K. Astrophysical Journal, 2008, 689, 1105-1111.	4.5	28
47	Long-lived complexes and signatures of chaos in ultracold <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:msub><mml:mi mathvariant="normal">K</mml:mi><mml:mn>2</mml:mn></mml:msub></mml:math> +Rb collisions. Physical Review A, 2017, 96, .	2.5	28
48	Oxygen Chemistry in the Interstellar Medium: The Effect of Vibrational Excitation of H2in the O(3P)+H2Reaction. Astrophysical Journal, 2005, 629, 305-310.	4.5	27
49	Ab initio quantum mechanical investigation of the photodissociation of HI and DI. Chemical Physics Letters, 2001, 341, 594-600.	2.6	26
50	Quantum Scattering Calculations of the H + O2â† O + OH Reactionâ€. Journal of Physical Chemistry A, 2004, 108, 8759-8764.	2.5	26
51	Full-dimensional quantum dynamics of rovibrationally inelastic scattering between CN and H2. Journal of Chemical Physics, 2016, 145, 224307.	3.0	26
52	Full-Dimensional Quantum Dynamics of SiO in Collision with H₂. Journal of Physical Chemistry A, 2018, 122, 1511-1520.	2.5	25
53	Non-adiabatic quantum interference in the ultracold Li + LiNa â† Li₂ + Na reaction. Physical Chemistry Chemical Physics, 2021, 23, 5096-5112.	2.8	25
54	Heavy atom tunneling in chemical reactions: Study of H+LiF collisions. Journal of Chemical Physics, 2005, 122, 234310.	3.0	24

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55	Dynamics of the O(P3)+H2 reaction at low temperatures: Comparison of quasiclassical trajectory with quantum scattering calculations. Journal of Chemical Physics, 2006, 124, 074308.	3.0	24
56	Geometric and electronic structures of hydrogenated transition metal (Sc, Ti, Zr) clusters. Physical Review B, 2009, 79, .	3.2	24
57	Hydrogen multicenter bonds and reversible hydrogen storage. Journal of Chemical Physics, 2009, 130, 114301.	3.0	23
58	Geometric phase effects in the ultracold H + H2 reaction. Journal of Chemical Physics, 2016, 145, 164303.	3.0	23
59	Structural, energetic, and electronic properties of hydrogenated titanium clusters. Journal of Chemical Physics, 2008, 128, 194714.	3.0	22
60	Isotope branching and tunneling in O([sup 3]P)+HDâ†'OH+D; OD+H reactions. Journal of Chemical Physics, 2004, 121, 11038.	3.0	21
61	Ultracold collisions and reactions of vibrationally excited OH radicals with oxygen atoms. Physical Chemistry Chemical Physics, 2011, 13, 19067.	2.8	21
62	Chemical reactivity of ultracold polar molecules: investigation of ${m H} + {m HCl}$ and ${m H} + {m DCl}$ collisions. European Physical Journal D, 2004, 31, 417-421.	1.3	20
63	ROVIBRATIONAL QUENCHING RATE COEFFICIENTS OF HD IN COLLISIONS WITH He. Astrophysical Journal, 2012, 744, 62.	4.5	19
64	Geometric phase effects in ultracold hydrogen exchange reaction. Journal of Physics B: Atomic, Molecular and Optical Physics, 2016, 49, 194004.	1.5	19
65	Controlling rotational quenching rates in cold molecular collisions. Journal of Chemical Physics, 2019, 150, 164302.	3.0	19
66	Control of polarized iodine atom branching ratio inNaIphotodissociation. Physical Review A, 2005, 71, .	2.5	18
67	QUANTUM CALCULATION OF INELASTIC CO COLLISIONS WITH H. II. PURE ROTATIONAL QUENCHING OF HIGH ROTATIONAL LEVELS. Astrophysical Journal, 2015, 811, 27.	4.5	18
68	Importance of Geometric Phase Effects in Ultracold Chemistry. Journal of Physical Chemistry A, 2015, 119, 12291-12303.	2.5	18
69	Quantum mechanical investigation of rovibrational relaxation of H2 and D2 by collisions with Ar atoms. Journal of Chemical Physics, 2005, 122, 024304.	3.0	17
70	Collisional Quenching of Highly Excited H₂ due to H₂ Collisions. Astrophysical Journal, 2018, 862, 132.	4.5	17
71	On the role of vibrationally excited H2as a source of OH in the mesosphere. Geophysical Research Letters, 2004, 31, .	4.0	16
72	Quenching of rotationally excited CO by collisions with H2. Journal of Chemical Physics, 2006, 124, 104304.	3.0	16

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73	Chemical reaction versus vibrational quenching in low energy collisions of vibrationally excited OH with O. Journal of Chemical Physics, 2013, 139, 194305.	3.0	16
74	Stereodynamics of rotationally inelastic scattering in cold He + HD collisions. Journal of Chemical Physics, 2020, 153, 091101.	3.0	16
75	Reactivity enhancement of ultracold O(P3)+H2 collisions by van der Waals interactions. Journal of Chemical Physics, 2005, 123, 144308.	3.0	15
76	Geometric phase effects in the ultracold D + HD $ ightarrow $ D + HD and D + HD $leftrightarrow $ H + D2reactions. New Journal of Physics, 2016, 18, 123020.	2.9	15
77	Stereodynamic control of overlapping resonances in cold molecular collisions. Physical Review Research, 2020, 2, .	3.6	14
78	Quantum defect theory for cold chemistry with product-quantum-state resolution. Physical Review A, 2014, 90, .	2.5	13
79	Symmetry and the geometric phase in ultracold hydrogen-exchange reactions. Journal of Chemical Physics, 2017, 147, 074302.	3.0	13
80	Ultracold collisions of O(1D) and H2: The effects of H2vibrational excitation on the production of vibrationally and rotationally excited OH. Journal of Chemical Physics, 2013, 138, 164310.	3.0	12
81	A full-dimensional quantum dynamical study of H2+H2 collisions: Coupled-states versus close-coupling formulation. Journal of Chemical Physics, 2014, 140, 064308.	3.0	12
82	QUANTUM CALCULATION OF INELASTIC CO COLLISIONS WITH H. III. RATE COEFFICIENTS FOR RO-VIBRATIONAL TRANSITIONS. Astrophysical Journal, 2015, 813, 96.	4.5	12
83	Isotope effects in complex scattering lengths for He collisions with molecular hydrogen. Physical Review A, 2010, 81, .	2.5	11
84	Mutual vibrational quenching in CO + H2 collisions. Chemical Physics, 2015, 462, 71-78.	1.9	11
85	Quantum dynamics of tunneling dominated reactions at low temperatures. New Journal of Physics, 2015, 17, 055027.	2.9	11
86	Quantum scattering calculations for ro-vibrational de-excitation of CO by hydrogen atoms. Journal of Chemical Physics, 2015, 142, 204303.	3.0	11
87	Machine learning corrected quantum dynamics calculations. Physical Review Research, 2020, 2, .	3.6	11
88	Full-Dimensional Potential Energy Surface for Ro-vibrationally Inelastic Scattering between H₂ Molecules. Journal of Chemical Theory and Computation, 2021, 17, 6747-6756.	5.3	11
89	Rotational Quenching of HD in Collisions with H₂: Resolving Discrepancies for Low-lying Rotational Transitions. Astrophysical Journal, 2018, 866, 95.	4.5	10
90	Globally Accurate Full-Dimensional Potential Energy Surface for H₂ + HCl Inelastic Scattering. Journal of Physical Chemistry A, 2019, 123, 6578-6586.	2.5	10

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91	Nitric oxide production in collisions of hot O(3P) atoms with N2. Journal of Geophysical Research, 2003, 108, .	3.3	9
92	A close-coupling study of vibrational-rotational quenching of CO by collision with hydrogen atoms. Journal of Chemical Physics, 2005, 123, 094308.	3.0	9
93	Inelastic vibrational dynamics of CS in collision with H₂ using a full-dimensional potential energy surface. Physical Chemistry Chemical Physics, 2018, 20, 28425-28434.	2.8	9
94	Photon catalysis of deuterium iodide photodissociation. Physical Chemistry Chemical Physics, 2019, 21, 14195-14204.	2.8	9
95	Rotational quenching of HD induced by collisions with H2 molecules. Monthly Notices of the Royal Astronomical Society, 2019, 488, 381-386.	4.4	9
96	Prediction of a Feshbach Resonance in the Below-the-Barrier Reactive Scattering of Vibrationally Excited HD withÂH. Journal of Physical Chemistry Letters, 2020, 11, 4970-4975.	4.6	9
97	Role of Low Energy Resonances in the Stereodynamics of Cold He + D₂ Collisions. Journal of Physical Chemistry Letters, 2022, 13, 4064-4072.	4.6	9
98	Dynamics of chemical reactions at cold and ultracold temperatures. Journal of Physics B: Atomic, Molecular and Optical Physics, 2006, 39, S1215-S1227.	1.5	8
99	Multichannel quantum defect theory for rovibrational transitions in ultracold molecule-molecule collisions. Physical Review A, 2014, 90, .	2.5	8
100	Stereodynamic control of cold rotationally inelastic CO + HD collisions. Physical Chemistry Chemical Physics, 2021, 23, 19364-19374.	2.8	8
101	Stereodynamics of ultracold rotationally inelastic collisions. Journal of Chemical Physics, 2020, 153, 184307.	3.0	8
102	Fine-structure resolved rotational transitions and database for CN+H2 collisions. Molecular Astrophysics, 2018, 11, 23-32.	1.6	7
103	Quantum dynamics of the Cl+H2 reaction at ultracold temperatures #. Journal of Chemical Sciences, 2012, 124, 311-316.	1.5	6
104	Quantum dynamics of O(¹D)+D₂ reaction: isotope and vibrational excitation effects. Journal of Physics B: Atomic, Molecular and Optical Physics, 2014, 47, 135202.	1.5	6
105	Inelastic cross sections and rate coefficients for collisions between CO and H2. Molecular Astrophysics, 2017, 6, 47-58.	1.6	6
106	Complex scattering lengths for ultracold He collisions with rotationally excited linear and nonlinear molecules. Physical Review A, 2010, 82, .	2.5	5
107	Inelastic, exchange, and reactive processes in rovibrationally excited collisions of HD with H. Monthly Notices of the Royal Astronomical Society, 2021, 507, 6012-6019.	4.4	4
108	Zero-Energy Resonances of Hydrogen Diatom Isotopologs: Tuning Quasiresonant Transitions in Vibration Space. Physical Review Letters, 2012, 109, 233201.	7.8	3

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109	Geometric Phase Effects in Ultracold Chemical Reactions. Atoms, 2019, 7, 65.	1.6	3
110	On the use of stereodynamical effects to control cold chemical reactions: The H + D2 âŸ· D + HD case study. Journal of Chemical Physics, 2022, 156, 044305.	3.0	3
111	Rainbow scattering in rotationally inelastic collisions of HCl and H2. Journal of Chemical Physics, 2021, 154, 104304.	3.0	2
112	Collisions and Reactions in Ultracold Gases. , 2015, , 241-260.		0
113	Geometric Phase and Interference Effects in Ultracold Chemical Reactions. Progress in Theoretical Chemistry and Physics, 2018, , 265-277.	0.2	0
114	Inelastic Collisions and Chemical Reactions of Molecules at Ultracold Temperatures. , 2009, , .		0
115	COLLISIONS AND REACTIONS IN ULTRACOLD GASES. , 2009, , .		0