Akshay Rao

List of Publications by Year
in descending order

103 papers	10,050 citations	61945 43 h-index	34964 98 g-index
107 all docs	107 docs citations	107 times ranked	9027 citing authors

#	Article	IF	Citations
1	The Role of Driving Energy and Delocalized States for Charge Separation in Organic Semiconductors. Science, 2012, 335, 1340-1344.	6.0	1,022
2	Ultrafast Long-Range Charge Separation in Organic Semiconductor Photovoltaic Diodes. Science, 2014, 343, 512-516.	6.0	807
3	The role of spin in the kinetic control of recombination in organic photovoltaics. Nature, 2013, 500, 435-439.	13.7	460
4	A transferable model for singlet-fission kinetics. Nature Chemistry, 2014, 6, 492-497.	6.6	402
5	Ultrafast Dynamics of Exciton Fission in Polycrystalline Pentacene. Journal of the American Chemical Society, 2011, 133, 11830-11833.	6.6	394
6	Harnessing singlet exciton fission to break the Shockleyâ€“Queisser limit. Nature Reviews Materials, 2017, 2, .	23.3	309
7	Real-time observation of multiexcitonic states in ultrafast singlet fission using coherent 2D electronic spectroscopy. Nature Chemistry, 2016, 8, 16-23.	6.6	308
8	Evidence for conical intersection dynamics mediating ultrafast singlet exciton fission. Nature Physics, 2015, 11, 352-357.	6.5	296
9	Exciton Fission and Charge Generation via Triplet Excitons in Pentacene/C₆₀ Bilayers. Journal of the American Chemical Society, 2010, 132, 12698-12703.	6.6	295
10	Long-range exciton transport in conjugated polymer nanofibers prepared by seeded growth. Science, 2018, 360, 897-900.	6.0	277
11	Resonant energy transfer of triplet excitons from pentacene to PbSe nanocrystals. Nature Materials, 2014, 13, 1033-1038.	13.3	246
12	Unequal Partnership: Asymmetric Roles of Polymeric Donor and Fullerene Acceptor in Generating Free Charge. Journal of the American Chemical Society, 2014, 136, 2876-2884.	6.6	235
13	Singlet Exciton Fission in Polycrystalline Pentacene: From Photophysics toward Devices. Accounts of Chemical Research, 2013, 46, 1330-1338.	7.6	230
14	The role of charge recombination to triplet excitons in organic solar cells. Nature, 2021, 597, 666-671.	13.7	225
15	Bimolecular Recombination in Organic Photovoltaics. Annual Review of Physical Chemistry, 2014, 65, 557-581.	4.8	218
16	Singlet Exciton Fission-Sensitized Infrared Quantum Dot Solar Cells. Nano Letters, 2012, 12, 1053-1057.	4.5	200
17	Polymer Blend Solar Cells Based on a Highâ€Mobility Naphthalenediimideâ€Based Polymer Acceptor: Device Physics, Photophysics and Morphology. Advanced Energy Materials, 2011, 1, 230-240.	10.2	199
18	Temperature-Independent Singlet Exciton Fission in Tetracene. Journal of the American Chemical Society, 2013, 135, 16680-16688.	6.6	198

#	Article	IF	Citations
19	Vibronically coherent ultrafast triplet-pair formation and subsequent thermally activated dissociation control efficient endothermic singlet fission. Nature Chemistry, 2017, 9, 1205-1212.	6.6	184
20	Strongly exchange-coupled triplet pairs in an organic semiconductor. Nature Physics, 2017, 13, 176-181.	6.5	182
21	Real-Time Observation of Excitonâ€“Phonon Coupling Dynamics in Self-Assembled Hybrid Perovskite Quantum Wells. ACS Nano, 2017, 11, 10834-10843.	7.3	181
22	What Controls the Rate of Ultrafast Charge Transfer and Charge Separation Efficiency in Organic Photovoltaic Blends. Journal of the American Chemical Society, 2016, 138, 11672-11679.	6.6	179
23	Lanthanide-doped inorganic nanoparticles turn molecular triplet excitons bright. Nature, 2020, 587, 594-599.	13.7	135
24	Operando optical tracking of single-particle ion dynamics in batteries. Nature, 2021, 594, 522-528.	13.7	121
25	Photophysics of pentacene thin films: The role of exciton fission and heating effects. Physical Review B, 2011, 84, .	1.1	114
26	Order enables efficient electron-hole separation at an organic heterojunction with a small energy loss. Nature Communications, 2018, 9, 277.	5.8	112
27	Exploiting Excited-State Aromaticity To Design Highly Stable Singlet Fission Materials. Journal of the American Chemical Society, 2019, 141, 13867-13876.	6.6	104
28	Excitonâ€Charge Annihilation in Organic Semiconductor Films. Advanced Functional Materials, 2012, 22, 1567-1577.	7.8	99
29	Visualizing excitations at buried heterojunctions in organic semiconductor blends. Nature Materials, 2017, 16, 551-557.	13.3	98
30	Long-range ballistic propagation of carriers in methylammonium lead iodide perovskite thin films. Nature Physics, 2020, 16, 171-176.	6.5	94
31	Quantitative Bimolecular Recombination in Organic Photovoltaics through Triplet Exciton Formation. Journal of the American Chemical Society, 2014, 136, 3424-3429.	6.6	93
32	Excited-State Dynamics in Fully Conjugated 2D Covalent Organic Frameworks. Journal of the American Chemical Society, 2019, 141, 11565-11571.	6.6	89
33	Ultrafast Long-Range Charge Separation in Nonfullerene Organic Solar Cells. ACS Nano, 2017, 11, 12473-12481.	7.3	82
34	Enhancing Photoluminescence and Mobilities in WS₂ Monolayers with Oleic Acid Ligands. Nano Letters, 2019, 19, 6299-6307.	4.5	80
35	Subnanosecond Geminate Charge Recombination in Polymer-Polymer Photovoltaic Devices. Physical Review Letters, 2010, 104, 177701.	2.9	79
36	Nanoscale chemical heterogeneity dominates the optoelectronic response of alloyed perovskite solar cells. Nature Nanotechnology, 2022, 17, 190-196.	15.6	75

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37	Photon Upconversion from Near-Infrared to Blue Light with TIPS-Anthracene as an Efficient Tripletâ€“Triplet Annihilator. , 2019, 1, 660-664.		68
38	Efficient energy transport in an organic semiconductor mediated by transient exciton delocalization. Science Advances, 2021, 7, .	4.7	68
39	Electroluminescence from Organometallic Lead Halide Perovskiteâ€Conjugated Polymer Diodes. Advanced Electronic Materials, 2015, 1, 1500008.	2.6	62
40	The Potential of Singlet Fission Photon Multipliers as an Alternative to Silicon-Based Tandem Solar Cells. ACS Energy Letters, 2018, 3, 2587-2592.	8.8	61
41	A molecular movie of ultrafast singlet fission. Nature Communications, 2019, 10, 4207.	5.8	54
42	Singlet Fission and Triplet Transfer to PbS Quantum Dots in TIPS-Tetracene Carboxylic Acid Ligands. Journal of Physical Chemistry Letters, 2018, 9, 1454-1460.	2.1	53
43	Rational Passivation of Sulfur Vacancy Defects in Two-Dimensional Transition Metal Dichalcogenides. ACS Nano, 2021, 15, 8780-8789.	7.3	52
44	Engineering Molecular Ligand Shells on Quantum Dots for Quantitative Harvesting of Triplet Excitons Generated by Singlet Fission. Journal of the American Chemical Society, 2019, 141, 12907-12915.	6.6	48
45	Photon upconversion utilizing energy beyond the band gap of crystalline silicon with a hybrid TES-ADT/PbS quantum dots system. Chemical Science, 2019, 10, 4750-4760.	3.7	47
46	Sub-10 fs Time-Resolved Vibronic Optical Microscopy. Journal of Physical Chemistry Letters, 2016, 7, 4854-4859.	2.1	44
47	Ultrafast Tracking of Exciton and Charge Carrier Transport in Optoelectronic Materials on the Nanometer Scale. Journal of Physical Chemistry Letters, 2019, 10, 6727-6733.	2.1	42
48	Photon upconversion through triplet exciton-mediated energy relay. Nature Communications, 2021, 12, 3704.	5.8	38
49	Ultrafast exciton transport at early times in quantum dot solids. Nature Materials, 2022, 21, 533-539.	13.3	38
50	Tuning the Coherent Propagation of Organic Excitonâ€Polaritons through Dark State Delocalization. Advanced Science, 2022, 9, e2105569.	5.6	38
51	Slow Carrier Cooling in Hybrid Pbâ€“Sn Halide Perovskites. ACS Energy Letters, 2019, 4, 736-740.	8.8	36
52	Impact of exciton delocalization on exciton-vibration interactions in organic semiconductors. Physical Review B, 2020, 102, .	1.1	36
53	Ultrafast Charge- and Energy-Transfer Dynamics in Conjugated Polymer: Cadmium Selenide Nanocrystal Blends. ACS Nano, 2014, 8, 1647-1654.	7.3	35
54	Interface limited charge extraction and recombination in organic photovoltaics. Energy and Environmental Science, 2014, 7, 2227.	15.6	33

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55	Direct vs Delayed Triplet Energy Transfer from Organic Semiconductors to Quantum Dots and Implications for Luminescent Harvesting of Triplet Excitons. ACS Nano, 2020, 14, 4224-4234.	7.3	33
56	Elucidation of Excitation Energy Dependent Correlated Triplet Pair Formation Pathways in an Endothermic Singlet Fission System. Journal of the American Chemical Society, 2018, 140, 4613-4622.	6.6	32
57	Ligand Shell Structure in Lead Sulfideâ€“Oleic Acid Colloidal Quantum Dots Revealed by Small-Angle Scattering. Journal of Physical Chemistry Letters, 2019, 10, 4713-4719.	2.1	32
58	Microcavity-like exciton-polaritons can be the primary photoexcitation in bare organic semiconductors. Nature Communications, 2021, 12, 6519.	5.8	32
59	Elucidating the Role of Antisolvents on the Surface Chemistry and Optoelectronic Properties of CsPbBr_xI_{3-x} Perovskite Nanocrystals. Journal of the American Chemical Society, 2022, 144, 12102-12115.	6.6	31
60	Excitonâ€“Phonon Interactions Govern Charge-Transfer-State Dynamics in CdSe/CdTe Two-Dimensional Colloidal Heterostructures. Journal of the American Chemical Society, 2018, 140, 14097-14111.	6.6	30
61	Imaging the coherent propagation of collective modes in the excitonic insulator Ta ₂ NiSe ₅ at room temperature. Science Advances, 2021, 7, .	4.7	29
62	Hybridizing semiconductor nanocrystals with metalâ€“organic frameworks for visible and near-infrared photon upconversion. Dalton Transactions, 2018, 47, 8590-8594.	1.6	28
63	Directed Energy Transfer from Monolayer WS₂ to Near-Infrared Emitting PbSâ€“CdS Quantum Dots. ACS Nano, 2020, 14, 15374-15384.	7.3	28
64	Ultrafast melting and recovery of collective order in the excitonic insulator Ta2NiSe5. Nature Communications, 2021, 12, 1699.	5.8	28
65	All-Optical Detection of Neuronal Membrane Depolarization in Live Cells Using Colloidal Quantum Dots. Nano Letters, 2019, 19, 8539-8549.	4.5	27
66	Efficient Energy Funneling in Spatially Tailored Segmented Conjugated Block Copolymer Nanofiberâ€“Quantum Dot or Rod Conjugates. Journal of the American Chemical Society, 2021, 143, 7032-7041.	6.6	25
67	Untargeted effects in organic excitonâ€“polariton transient spectroscopy: A cautionary tale. Journal of Chemical Physics, 2021, 155, 154701.	1.2	24
68	Femtosecond Transient Absorption Microscopy of Singlet Exciton Motion in Side-Chain Engineered Perylene-Diimide Thin Films. Journal of Physical Chemistry A, 2020, 124, 2721-2730.	1.1	23
69	Singlet exciton fission via an intermolecular charge transfer state in coevaporated pentacene-perfluoropentacene thin films. Journal of Chemical Physics, 2019, 151, 164706.	1.2	22
70	Ultrafast Dynamics of Polariton Cooling and Renormalization in an Organic Single-Crystal Microcavity under Nonresonant Pumping. ACS Photonics, 2018, 5, 2182-2188.	3.2	21
71	Improving the photoluminescence quantum yields of quantum dot films through a donor/acceptor system for near-IR LEDs. Materials Horizons, 2019, 6, 137-143.	6.4	20
72	Excimer Formation in Carboxylic Acid-Functionalized Perylene Diimides Attached to Silicon Dioxide Nanoparticles. Journal of Physical Chemistry C, 2019, 123, 3433-3440.	1.5	20

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73	Fine Structure and Spin Dynamics of Linearly Polarized Indirect Excitons in Two-Dimensional CdSe/CdTe Colloidal Heterostructures. ACS Nano, 2019, 13, 10140-10153.	7.3	18
74	Organic-quantum dot hybrid interfaces and their role in photon fission/fusion applications. Chemical Physics Reviews, 2021, 2, 031305.	2.6	17
75	Mechanistic insight into the chemical treatments of monolayer transition metal disulfides for photoluminescence enhancement. Nature Communications, 2021, 12, 6044.	5.8	17
76	Simple and Robust Panchromatic Light Harvesting Antenna Composites via FRET Engineering in Solid State Host Matrices. Journal of Physical Chemistry C, 2018, 122, 22330-22338.	1.5	16
77	Excitation Dynamics in Layered Lead Halide Perovskite Crystal Slabs and Microcavities. ACS Photonics, 2020, 7, 845-852.	3.2	16
78	Extracting quantitative dielectric properties from pump-probe spectroscopy. Nature Communications, 2022, 13, 1437.	5.8	16
79	Observation of Vibronic-Coupling-Mediated Energy Transfer in Light-Harvesting Nanotubes Stabilized in a Solid-State Matrix. Journal of Physical Chemistry Letters, 2018, 9, 5604-5611.	2.1	15
80	Optical Projection and Spatial Separation of Spin-Entangled Triplet Pairs from the S1 (21 Agâ€“) State of Pi-Conjugated Systems. CheM, 2020, 6, 2826-2851.	5.8	15
81	Deoxyribonucleic Acid Encoded and Size-Defined Ï€-Stacking of Perylene Diimides. Journal of the American Chemical Society, 2022, 144, 368-376.	6.6	15
82	First principles modeling of exciton-polaritons in polydiacetylene chains. Journal of Chemical Physics, 2020, 153, 084103.	1.2	14
83	Giant photoluminescence enhancement in MoSe₂ monolayers treated with oleic acid ligands. Nanoscale Advances, 2021, 3, 4216-4225.	2.2	14
84	Emission State Structure and Linewidth Broadening Mechanisms in Type-II CdSe/CdTe Coreâ€“Crown Nanoplatelets: A Combined Theoreticalâ€“Single Nanocrystal Optical Study. Journal of Physical Chemistry C, 2020, 124, 17352-17363.	1.5	13
85	Nonequilibrium Carrier Transport in Quantum Dot Heterostructures. Nano Letters, 2021, 21, 8945-8951.	4.5	13
86	Exciton Diffusion in Highly-Ordered One Dimensional Conjugated Polymers: Effects of Back-Bone Torsion, Electronic Symmetry, Phonons and Annihilation. Journal of Physical Chemistry Letters, 2021, 12, 3669-3678.	2.1	12
87	Charge Generation and Electron-Trapping Dynamics in Hybrid Nanocrystal-Polymer Solar Cells. Journal of Physical Chemistry C, 2016, 120, 19064-19069.	1.5	11
88	Thiol-Anchored TIPS-Tetracene Ligands with Quantitative Triplet Energy Transfer to PbS Quantum Dots and Improved Thermal Stability. Journal of Physical Chemistry Letters, 2020, 11, 7239-7244.	2.1	11
89	All-optical augmentation of solar cells using a combination of up- and downconversion. Journal of Photonics for Energy, 2018, 8, 1.	0.8	11
90	Optical and Electronic Properties of Colloidal CdSe Quantum Rings. ACS Nano, 2020, 14, 14740-14760.	7.3	8

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91	Enhanced Ballistic Transport of Charge Carriers in Alloyed and K-Passivated Alloyed Perovskite Thin Films. Journal of Physical Chemistry Letters, 2020, 11, 5402-5406.	2.1	8
92	Chain Coupling and Luminescence in High-Mobility, Low-Disorder Conjugated Polymers. ACS Nano, 2019, 13, 13716-13727.	7.3	7
93	Pentaceneâ€“Bridge Interactions in an Axially Chiral Binaphthyl Pentacene Dimer. Journal of Physical Chemistry A, 2021, 125, 7226-7234.	1.1	7
94	Controlling the structures of organic semiconductorâ€“quantum dot nanocomposites through ligand shell chemistry. Soft Matter, 2020, 16, 7970-7981.	1.2	4
95	Ultrafast Long-Range Energy Transport via Strong Light-Matter Coupling in Organic Semiconductor Films. , 0, , .		2
96	Singlet Fission: Mechanisms and Molecular Design. , 2022, , 291-311.		2
97	Insights into the Structure and Selfâ€Assembly of Organicâ€Semiconductor/Quantumâ€Dot Blends. Advanced Functional Materials, 2022, 32, 2109252.	7.8	2
98	Scan Strategies for Electron Energy Loss Spectroscopy at Optical and Vibrational Energies in Perylene Diimide Nanobelts. Microscopy and Microanalysis, 2019, 25, 1738-1739.	0.2	1
99	Shaky lattices for lightâ€“matter interactions. Nature Materials, 2019, 18, 307-308.	13.3	0
100	Long-Range Electrostatics Supercharge Exciton Transport. , 0, , .		0
101	Energetic Dependence of Triplet Energy Transfer to PbS Quantum Dots for Singlet-Fission Based Photo-multiplication. , 0, , .		0
102	Energetic Dependence of Triplet Energy Transfer to PbS Quantum Dots for Singlet-Fission Based Photo-multiplication. , 0, , .		0
103	Understanding Surface Photovoltage Measurements on Metal Halide Perovskite Bilayers. , 0, , .		0