Alexander Borst

List of Publications by Citations

148 papers	9,808 citations	53 h-index	96 g-index
154 ext. papers	11,311 ext. citations	8.8 avg, IF	6.49 L-index

#	Paper	IF	Citations
148	Information theory and neural coding. *Nature Neuroscience*, **1999**, 2, 947-57	25.5	754
147	Drosophila mushroom body mutants are deficient in olfactory learning. *Journal of Neurogenetics*, **1985**, 2, 1-30	1.6	570
146	A genetically encoded calcium indicator for chronic in vivo two-photon imaging. *Nature Methods*, **2008**, 5, 805-11	21.6	402
145	Principles of visual motion detection. *Trends in Neurosciences*, **1989**, 12, 297-306	13.3	373
144	Fluorescence changes of genetic calcium indicators and OGB-1 correlated with neural activity and calcium in vivo and in vitro. *Journal of Neuroscience*, **2008**, 28, 7399-411	6.6	366
143	A FRET-based calcium biosensor with fast signal kinetics and high fluorescence change. *Biophysical Journal*, **2006**, 90, 1790-6	2.9	249
142	Fly motion vision. *Annual Review of Neuroscience*, **2010**, 33, 49-70	17	246
141	A directional tuning map of Drosophila elementary motion detectors. *Nature*, **2013**, 500, 212-6	50.4	241
140	ON and OFF pathways in Drosophila motion vision. *Nature*, **2010**, 468, 300-4	50.4	234
139	One rule to grow them all: a general theory of neuronal branching and its practical application. *PLoS Computational Biology*, **2010**, 6, e1000877	5	226
138	Neural networks in the cockpit of the fly. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2002**, 188, 419-37	2.3	212
137	Computational structure of a biological motion-detection system as revealed by local detector analysis in the fly\'s nervous system. *Journal of the Optical Society of America A: Optics and Image Science, and Vision*, **1989**, 6, 1070-87	1.8	197
136	In vivo performance of genetically encoded indicators of neural activity in flies. *Journal of Neuroscience*, **2005**, 25, 4766-78	6.6	182
135	Seeing things in motion: models, circuits, and mechanisms. *Neuron*, **2011**, 71, 974-94	13.9	176
134	Response properties of motion-sensitive visual interneurons in the lobula plate of Drosophila melanogaster. *Current Biology*, **2008**, 18, 368-74	6.3	157
133	Dendritic integration and its role in computing image velocity. *Science*, **1998**, 281, 1848-50	33.3	143
132	Transient and steady-state response properties of movement detectors. *Journal of the Optical Society of America A: Optics and Image Science, and Vision*, **1989**, 6, 116-27	1.8	142

131	Drosophila's view on insect vision. *Current Biology*, **2009**, 19, R36-47	6.3	140
130	Common circuit design in fly and mammalian motion vision. *Nature Neuroscience*, **2015**, 18, 1067-76	25.5	132
129	Internal structure of the fly elementary motion detector. *Neuron*, **2011**, 70, 1155-64	13.9	129
128	Object tracking in motion-blind flies. *Nature Neuroscience*, **2013**, 16, 730-8	25.5	109
127	Mechanisms of dendritic integration underlying gain control in fly motion-sensitive interneurons. *Journal of Computational Neuroscience*, **1995**, 2, 5-18	1.4	108
126	Fly visual course control: behaviour, algorithms and circuits. *Nature Reviews Neuroscience*, **2014**, 15, 590-9	23.5	107
125	Adaptation without parameter change: Dynamic gain control in motion detection. *Proceedings of the National Academy of Sciences of the United States of America*, **2005**, 102, 6172-6	11.5	98
124	Flight activity alters velocity tuning of fly motion-sensitive neurons. *Journal of Neuroscience*, **2011**, 31, 9231-7	6.6	95
123	The intrinsic electrophysiological characteristics of fly lobula plate tangential cells: I. Passive membrane properties. *Journal of Computational Neuroscience*, **1996**, 3, 313-36	1.4	92
122	Amplification of high-frequency synaptic inputs by active dendritic membrane processes. *Nature*, **1996**, 379, 639-641	50.4	92
121	Visual Circuits for Direction Selectivity. *Annual Review of Neuroscience*, **2017**, 40, 211-230	17	91
120	Encoding of visual motion information and reliability in spiking and graded potential neurons. *Journal of Neuroscience*, **1997**, 17, 4809-19	6.6	88
119	Osmotropotaxis inDrosophila melanogaster. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **1982**, 147, 479-484	2.3	86
118	Neural mechanism underlying complex receptive field properties of motion-sensitive interneurons. *Nature Neuroscience*, **2004**, 7, 628-34	25.5	85
117	Visualizing retinotopic half-wave rectified input to the motion detection circuitry of Drosophila. *Nature Neuroscience*, **2010**, 13, 973-8	25.5	84
116	Heterogeneity in synaptic transmission along a Drosophila larval motor axon. *Nature Neuroscience*, **2005**, 8, 1188-96	25.5	84
115	Columnar cells necessary for motion responses of wide-field visual interneurons in Drosophila. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2012**, 198, 389-95	2.3	80
114	Optogenetic and pharmacologic dissection of feedforward inhibition in Drosophila motion vision. *Journal of Neuroscience*, **2014**, 34, 2254-63	6.6	75

113	Dendritic computation of direction selectivity and gain control in visual interneurons. *Journal of Neuroscience*, **1997**, 17, 6023-30	6.6	75
112	The morphological identity of insect dendrites. *PLoS Computational Biology*, **2008**, 4, e1000251	5	75
111	Neural Circuit to Integrate Opposing Motions in the Visual Field. *Cell*, **2015**, 162, 351-362	56.2	73
110	The Temporal Tuning of the Drosophila Motion Detectors Is Determined by the Dynamics of Their Input Elements. *Current Biology*, **2017**, 27, 929-944	6.3	67
109	Integration of lobula plate output signals by DNOVS1, an identified premotor descending neuron. *Journal of Neuroscience*, **2007**, 27, 1992-2000	6.6	66
108	Optogenetic control of fly optomotor responses. *Journal of Neuroscience*, **2013**, 33, 13927-34	6.6	60
107	Adaptation of response transients in fly motion vision. II: Model studies. *Vision Research*, **2003**, 43, 1309-22	2.1	60
106	Recurrent network interactions underlying flow-field selectivity of visual interneurons. *Journal of Neuroscience*, **2001**, 21, 5685-92	6.6	59
105	Dendritic integration of motion information in visual interneurons of the blowfly. *Neuroscience Letters*, **1992**, 140, 173-6	3.3	59
104	Complementary mechanisms create direction selectivity in the fly. *ELife*, **2016**, 5,	8.9	59
103	Comprehensive Characterization of the Major Presynaptic Elements to the Drosophila OFF Motion Detector. *Neuron*, **2016**, 89, 829-41	13.9	58
102	Dendro-dendritic interactions between motion-sensitive large-field neurons in the fly. *Journal of Neuroscience*, **2002**, 22, 3227-33	6.6	57
101	The intrinsic electrophysiological characteristics of fly lobula plate tangential cells: II. Active membrane properties. *Journal of Computational Neuroscience*, **1997**, 4, 349-69	1.4	56
100	Active membrane properties and signal encoding in graded potential neurons. *Journal of Neuroscience*, **1998**, 18, 7972-86	6.6	56
99	Functional specialization of parallel motion detection circuits in the fly. *Journal of Neuroscience*, **2013**, 33, 902-5	6.6	55
98	Contour-propagation algorithms for semi-automated reconstruction of neural processes. *Journal of Neuroscience Methods*, **2008**, 167, 349-57	3	54
97	Quantifying variability in neural responses and its application for the validation of model predictions. *Network: Computation in Neural Systems*, **2004**, 15, 91-109	0.7	53
96	The intrinsic electrophysiological characteristics of fly lobula plate tangential cells: III. Visual response properties. *Journal of Computational Neuroscience*, **1999**, 7, 213-34	1.4	53

95	How Do Flies Land?. *BioScience*, **1990**, 40, 292-299	5.7	53
94	The TREES toolbox--probing the basis of axonal and dendritic branching. *Neuroinformatics*, **2011**, 9, 91-6	3.2	52
93	Central gating of fly optomotor response. *Proceedings of the National Academy of Sciences of the United States of America*, **2010**, 107, 20104-9	11.5	52
92	Are there separate ON and OFF channels in fly motion vision?. *Visual Neuroscience*, **1992**, 8, 151-64	1.7	51
91	Neural circuit components of the Drosophila OFF motion vision pathway. *Current Biology*, **2014**, 24, 385-92	8.3	50
90	Asymmetry of Drosophila ON and OFF motion detectors enhances real-world velocity estimation. *Nature Neuroscience*, **2016**, 19, 706-715	25.5	49
89	Nonlinear integration of binocular optic flow by DNOVS2, a descending neuron of the fly. *Journal of Neuroscience*, **2008**, 28, 3131-40	6.6	49
88	Sharing receptive fields with your neighbors: tuning the vertical system cells to wide field motion. *Journal of Neuroscience*, **2005**, 25, 3985-93	6.6	48
87	Nonlinear, binocular interactions underlying flow field selectivity of a motion-sensitive neuron. *Nature Neuroscience*, **2006**, 9, 1312-20	25.5	47
86	Different receptive fields in axons and dendrites underlie robust coding in motion-sensitive neurons. *Nature Neuroscience*, **2009**, 12, 327-32	25.5	46
85	Effects of mean firing on neural information rate. *Journal of Computational Neuroscience*, **2001**, 10, 213-21	2.4	46
84	Robust coding of flow-field parameters by axo-axonal gap junctions between fly visual interneurons. *Proceedings of the National Academy of Sciences of the United States of America*, **2007**, 104, 10229-33	11.5	45
83	The role of GABA in detecting visual motion. *Brain Research*, **1990**, 509, 156-60	3.7	45
82	Spatial distribution and characteristics of voltage-gated calcium signals within visual interneurons. *Journal of Neurophysiology*, **2000**, 83, 1039-51	3.2	41
81	Functional Specialization of Neural Input Elements to the Drosophila ON Motion Detector. *Current Biology*, **2015**, 25, 2247-53	6.3	40
80	Visual information processing in the fly's landing system. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **1988**, 163, 167-173	2.3	40
79	Candidate glutamatergic neurons in the visual system of Drosophila. *PLoS ONE*, **2011**, 6, e19472	3.7	39
78	Synaptic organization of lobula plate tangential cells in Drosophila: gamma-aminobutyric acid receptors and chemical release sites. *Journal of Comparative Neurology*, **2007**, 502, 598-610	3.4	39

77	Spatial distribution of low- and high-voltage-activated calcium currents in neurons of the deep cerebellar nuclei. *Journal of Neuroscience*, **2001**, 21, RC158	6.6	39
76	Computation of olfactory signals inDrosophila melanogaster. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **1983**, 152, 373-383	2.3	39
75	How fly neurons compute the direction of visual motion. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2020**, 206, 109-124	2.3	39
74	Quantifying variability in neural responses and its application for the validation of model predictions. *Network: Computation in Neural Systems*, **2004**, 15, 91-109	0.7	38
73	Neural image processing by dendritic networks. *Proceedings of the National Academy of Sciences of the United States of America*, **2003**, 100, 11082-5	11.5	37
72	Robust coding of ego-motion in descending neurons of the fly. *Journal of Neuroscience*, **2009**, 29, 14993-5000	6.6	36
71	Synapse distribution on VCH, an inhibitory, motion-sensitive interneuron in the fly visual system. *Journal of Comparative Neurology*, **1997**, 381, 489-499	3.4	36
70	Dye-coupling visualizes networks of large-field motion-sensitive neurons in the fly. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2005**, 191, 445-54	2.3	33
69	Dendritic processing of synaptic information by sensory interneurons. *Trends in Neurosciences*, **1994** , 17, 257-63	13.3	33
68	Bio-inspired visual ego-rotation sensor for MAVs. *Biological Cybernetics*, **2012**, 106, 51-63	2.8	31
67	Local and global motion preferences in descending neurons of the fly. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2009**, 195, 1107-20	2.3	31
66	Optogenetic Neuronal Silencing in Drosophila during Visual Processing. *Scientific Reports*, **2017**, 7, 13823	4.9	30
65	Neurons with cholinergic phenotype in the visual system of Drosophila. *Journal of Comparative Neurology*, **2011**, 519, 162-76	3.4	30
64	Input organization of multifunctional motion-sensitive neurons in the blowfly. *Journal of Neuroscience*, **2003**, 23, 9805-11	6.6	30
63	Different mechanisms of calcium entry within different dendritic compartments. *Journal of Neurophysiology*, **2002**, 87, 1616-24	3.2	30
62	Mechanisms of dendritic calcium signaling in fly neurons. *Journal of Neurophysiology*, **2001**, 85, 439-47	3.2	30
61	Correlation versus gradient type motion detectors: the pros and cons. *Philosophical Transactions of the Royal Society B: Biological Sciences*, **2007**, 362, 369-74	5.8	28
60	Models of motion detection. *Nature Neuroscience*, **2000**, 3 Suppl, 1168	25.5	28

59	A common directional tuning mechanism of motion-sensing neurons in the ON and in the OFF pathway. *ELife*, **2017**, 6,	8.9	28
58	Neural Mechanisms for Drosophila Contrast Vision. *Neuron*, **2015**, 88, 1240-1252	13.9	27
57	Preserving neural function under extreme scaling. *PLoS ONE*, **2013**, 8, e71540	3.7	26
56	Synaptic organization of lobula plate tangential cells in Drosophila: Dalpha7 cholinergic receptors. *Journal of Neurogenetics*, **2009**, 23, 200-9	1.6	25
55	Local motion detectors are required for the computation of expansion flow-fields. *Biology Open*, **2015**, 4, 1105-8	2.2	24
54	In search of the Holy Grail of fly motion vision. *European Journal of Neuroscience*, **2014**, 40, 3285-93	3.5	23
53	Neural action fields for optic flow based navigation: a simulation study of the fly lobula plate network. *PLoS ONE*, **2011**, 6, e16303	3.7	22
52	An FPGA implementation of insect-inspired motion detector for high-speed vision systems **2008**,		21
51	Noise, not stimulus entropy, determines neural information rate. *Journal of Computational Neuroscience*, **2003**, 14, 23-31	1.4	21
50	Extreme Compartmentalization in a Drosophila Amacrine Cell. *Current Biology*, **2019**, 29, 1545-1550.e2	6.3	20
49	Electrical coupling of lobula plate tangential cells to a heterolateral motion-sensitive neuron in the fly. *Journal of Neuroscience*, **2008**, 28, 14435-42	6.6	20
48	Transgenic line for the identification of cholinergic release sites in. *Journal of Experimental Biology*, **2017**, 220, 1405-1410	3	19
47	Cholinergic and GABAergic pathways in fly motion vision. *BMC Neuroscience*, **2001**, 2, 1	3.2	19
46	Subcellular mapping of dendritic activity in optic flow processing neurons. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2014**, 200, 359-70	2.3	18
45	Reciprocal inhibitory connections within a neural network for rotational optic-flow processing. *Frontiers in Neuroscience*, **2007**, 1, 111-21	5.1	18
44	RNA-Seq Transcriptome Analysis of Direction-Selective T4/T5 Neurons in Drosophila. *PLoS ONE*, **2016**, 11, e0163986	3.7	18
43	A biophysical mechanism for preferred direction enhancement in fly motion vision. *PLoS Computational Biology*, **2018**, 14, e1006240	5	17
42	Adaptation and information transmission in fly motion detection. *Journal of Neurophysiology*, **2007**, 98, 3309-20	3.2	17

41	Local current spread in electrically compact neurons of the fly. *Neuroscience Letters*, **2000**, 285, 123-6	3.3	17
40	Dynamic Signal Compression for Robust Motion Vision in Flies. *Current Biology*, **2020**, 30, 209-221.e8	6.3	15
39	Coding efficiency of fly motion processing is set by firing rate, not firing precision. *PLoS Computational Biology*, **2010**, 6, e1000860	5	15
38	Relating a calcium indicator signal to the unperturbed calcium concentration time-course. *Theoretical Biology and Medical Modelling*, **2007**, 4, 7	2.3	15
37	Neural Circuits for Motion Vision in the Fly. *Cold Spring Harbor Symposia on Quantitative Biology*, **2014**, 79, 131-9	3.9	14
36	Bi-directional Control of Walking Behavior by Horizontal Optic Flow Sensors. *Current Biology*, **2018**, 28, 4037-4045.e5	6.3	14
35	Integration of binocular optic flow in cervical neck motor neurons of the fly. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2012**, 198, 655-68	2.3	13
34	Spatiotemporal response properties of optic-flow processing neurons. *Neuron*, **2010**, 67, 629-42	13.9	13
33	Disentangling the functional consequences of the connectivity between optic-flow processing neurons. *Nature Neuroscience*, **2012**, 15, 441-8, S1-2	25.5	11
32	Transcriptional control of morphological properties of direction-selective T4/T5 neurons in. *Development (Cambridge)*, **2019**, 146,	6.6	11
31	Glutamate Signaling in the Fly Visual System. *IScience*, **2018**, 7, 85-95	6.1	11
30	Optic flow-based course control in insects. *Current Opinion in Neurobiology*, **2020**, 60, 21-27	7.6	10
29	Insect-inspired high-speed motion vision system for robot control. *Biological Cybernetics*, **2012**, 106, 453-68	2.5	9
28	Neural circuits for elementary motion detection. *Journal of Neurogenetics*, **2014**, 28, 361-73	1.6	8
27	Neural mechanisms underlying sensitivity to reverse-phi motion in the fly. *PLoS ONE*, **2017**, 12, e0189019	3.7	7
26	Conditional protein tagging methods reveal highly specific subcellular distribution of ion channels in motion-sensing neurons. *ELife*, **2020**, 9,	8.9	7
25	A combinatorial code of transcription factors specifies subtypes of visual motion-sensing neurons in. *Development (Cambridge)*, **2020**, 147,	6.6	7
24	Efficient encoding of motion is mediated by gap junctions in the fly visual system. *PLoS Computational Biology*, **2017**, 13, e1005846	5	6

23	Propagation of photon noise and information transfer in visual motion detection. *Journal of Computational Neuroscience*, **2006**, 20, 167-78	1.4	6
22	Direction selectivity in ganglion cells: pre or post?. *Nature Neuroscience*, **2001**, 4, 119-20	25.5	6
21	Neural mechanism of spatio-chromatic opponency in the Drosophila amacrine neurons. *Current Biology*, **2021**, 31, 3040-3052.e9	6.3	6
20	A biophysical account of multiplication by a single neuron.. *Nature*, **2022**, 603, 119-123	50.4	6
19	Electrophysiological Recordings from Lobula Plate Tangential Cells in Drosophila. *Methods in Molecular Biology*, **2016**, 1478, 321-332	1.4	5
18	Dendritic end inhibition in large-field visual neurons of the fly. *Journal of Neuroscience*, **2013**, 33, 3659-67	6.6	4
17	Aerial course stabilization is impaired in motion-blind flies. *Journal of Experimental Biology*, **2021**, 224,	3	4
16	Visual Flight Control of a Quadrotor Using Bioinspired Motion Detector. *International Journal of Navigation and Observation*, **2012**, 2012, 1-9		3
15	Anatomical distribution and functional roles of electrical synapses in Drosophila.. *Current Biology*, **2022**,	6.3	3
14	Motion Vision in Arthropods **2019**, 318-344		2
13	Complementary motion tuning in frontal nerve motor neurons of the blowfly. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, **2015**, 201, 411-26	2.3	2
12	ON and OFF Pathways in Drosophila Motion Detection. *E-Neuroforum*, **2011**, 17, 30-32		2
11	The broader, the better? Drosophila olfactory interneurons are found to respond to a wider range of odorants than their immediate sensory input. *Neuron*, **2007**, 54, 6-8	13.9	2
10	Non-uniform weighting of local motion inputs underlies dendritic computation in the fly visual system. *Scientific Reports*, **2018**, 8, 5787	4.9	1
9	Seeing Natural Images through the Eye of a Fly with Remote Focusing Two-Photon Microscopy. *IScience*, **2020**, 23, 101170	6.1	0
8	The neural network behind the eyes of a fly. *Current Opinion in Physiology*, **2020**, 16, 33-42	2.6	0
7	Maximally efficient prediction in the early fly visual system may support evasive flight maneuvers. *PLoS Computational Biology*, **2021**, 17, e1008965	5	0
6	Modelling the Cellular Mechanisms of Fly Optic Flow Processing. *Springer Series in Computational Neuroscience*, **2014**, 259-275	1.1	

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4 Correlation versus gradient type motion detectors: the pros and cons63-73

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2 Visual Motion Detection in Drosophila **2013**, 1-15

1 Visual Motion Detection in Drosophila **2022**, 3568-3581