

# Friedrich W Hehl

## List of Publications by Year in descending order

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102  
papers

7,379  
citations

94433

37  
h-index

58581

82  
g-index

104  
all docs

104  
docs citations

104  
times ranked

1850  
citing authors

#	ARTICLE	IF	CITATIONS
1	General relativity with spin and torsion: Foundations and prospects. <i>Reviews of Modern Physics</i> , 1976, 48, 393-416.	45.6	2,063
2	Metric-affine gauge theory of gravity: field equations, Noether identities, world spinors, and breaking of dilation invariance. <i>Physics Reports</i> , 1995, 258, 1-171.	25.6	1,196
3	Foundations of Classical Electrodynamics. , 2003, , .		393
4	Inertial effects of a Dirac particle. <i>Physical Review D</i> , 1990, 42, 2045-2048.	4.7	352
5	Gauge Theories of Gravitation. , 2013, , .		156
6	The Cotton tensor in Riemannian spacetimes. <i>Classical and Quantum Gravity</i> , 2004, 21, 1099-1118.	4.0	117
7	On the energy tensor of spinning massive matter in classical field theory and general relativity. <i>Reports on Mathematical Physics</i> , 1976, 9, 55-82.	0.8	108
8	Metric-affine variational principles in general relativity II. Relaxation of the Riemannian constraint. <i>General Relativity and Gravitation</i> , 1981, 13, 1037-1056.	2.0	102
9	Nonlocal gravity simulates dark matter. <i>Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics</i> , 2009, 673, 279-282.	4.1	95
10	On the kinematics of the torsion of space-time. <i>Foundations of Physics</i> , 1985, 15, 451-471.	1.3	86
11	Translational gauge theory of gravity: Post-newtonian approximation and spin precession. <i>Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics</i> , 1980, 90, 98-102.	4.1	84
12	Formal framework for a nonlocal generalization of Einstein's theory of gravitation. <i>Physical Review D</i> , 2009, 79, .	4.7	84
13	Beyond Einstein's Cartan gravity: quadratic torsion and curvature invariants with even and odd parity including all boundary terms. <i>Classical and Quantum Gravity</i> , 2011, 28, 215017.	4.0	84
14	Electromagnetic energy-momentum and forces in matter. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 2003, 311, 277-284.	2.1	80
15	Measuring a piecewise constant axion field in classical electrodynamics. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 2005, 341, 357-365.	2.1	80
16	METRIC-AFFINE GAUGE THEORY OF GRAVITY II: EXACT SOLUTIONS. <i>International Journal of Modern Physics D</i> , 1999, 08, 399-416.	2.1	79
17	On Poincaré gauge theory of gravity, its equations of motion, and Gravity Probe B. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 2013, 377, 1775-1781.	2.1	76
18	Relativistic nature of a magnetoelectric modulus of $\text{CrO}_3$ crystals: A four-dimensional pseudoscalar and its measurement. <i>Physical Review A</i> , 2008, 77, .	2.5	74

#	ARTICLE	IF	CITATIONS
19	Riemannian light cone from vanishing birefringence in premetric vacuum electrodynamics. <i>Physical Review D</i> , 2004, 70, .	4.7	71
20	Bianchi identities and the automatic conservation of energy-momentum and angular momentum in general-relativistic field theories. <i>Foundations of Physics</i> , 1986, 16, 267-293.	1.3	68
21	Poincaré gauge theory of gravity: Friedman cosmology with even and odd parity modes: Analytic part. <i>Physical Review D</i> , 2011, 83, .	4.7	68
22	On Hypermomentum in General Relativity I. The Notion of Hypermomentum. <i>Zeitschrift Fur Naturforschung - Section A Journal of Physical Sciences</i> , 1976, 31, 111-114.	1.5	67
23	How Does the Electromagnetic Field Couple to Gravity, in Particular to Metric, Nonmetricity, Torsion, and Curvature?. , 2001, , 479-504.		67
24	Linear media in classical electrodynamics and the Post constraint. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 2005, 334, 249-259.	2.1	65
25	Progress in metric-affine gauge theories of gravity with local scale invariance. <i>Foundations of Physics</i> , 1989, 19, 1075-1100.	1.3	64
26	Exact vacuum solution of a(1+2)-dimensional Poincaré gauge theory: BTZ solution with torsion. <i>Physical Review D</i> , 2003, 67, .	4.7	63
27	Einstein-aether theory, violation of Lorentz invariance, and metric-affine gravity. <i>Physical Review D</i> , 2005, 72, .	4.7	63
28	Nonlocal modification of Newtonian gravity. <i>Physical Review D</i> , 2010, 81, .	4.7	61
29	Exterior calculus on the computer: The REDUCE-package EXCALC applied to general relativity and to the Poincaré gauge theory. <i>General Relativity and Gravitation</i> , 1987, 19, 197-218.	2.0	56
30	The exterior gravitational field of a charged spinning source in the poincaré gauge theory: A Kerr-newman metric with dynamic torsion. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 1988, 128, 245-250.	2.1	51
31	Chern-Simons terms in metric-affine space-time: Bianchi identities as Euler-Lagrange equations. <i>Journal of Mathematical Physics</i> , 1991, 32, 2169-2180.	1.1	51
32	Cartan's Spiral Staircase in Physics and, in Particular, in the Gauge Theory of Dislocations. <i>Foundations of Physics</i> , 2010, 40, 1298-1325.	1.3	47
33	Maxwell's field coupled nonminimally to quadratic torsion: Axion and birefringence. <i>Physical Review D</i> , 2003, 68, .	4.7	46
34	Relativistic analysis of magnetoelectric crystals: Extracting a new 4-dimensional P odd and T odd pseudoscalar from Cr2O3 data. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 2008, 372, 1141-1146.	2.1	46
35	On the chiral anomaly in non-Riemannian spacetimes. <i>Foundations of Physics</i> , 1997, 27, 1221-1236.	1.3	43
36	A Brief Guide to Variations in Teleparallel Gauge Theories of Gravity and the Kaniel-Itin Model. <i>General Relativity and Gravitation</i> , 1998, 30, 933-961.	2.0	42

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37	Maxwell's theory on a post-Riemannian spacetime and the equivalence principle. Classical and Quantum Gravity, 1997, 14, 1347-1356.	4.0	40
38	On Hypermomentum in General Relativity III. Coupling Hypermomentum to Geometry. Zeitschrift Fur Naturforschung - Section A Journal of Physical Sciences, 1976, 31, 823-827.	1.5	39
39	Spacetime metric from linear electrodynamics. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 1999, 458, 466-470.	4.1	39
40	Is the Lorentz signature of the metric of spacetime electromagnetic in origin?. Annals of Physics, 2004, 312, 60-83.	2.8	38
41	Four Lectures on Poincaré Gauge Field Theory. , 1980, , 5-61.		37
42	Test matter in a spacetime with nonmetricity. Classical and Quantum Gravity, 1997, 14, A251-A259.	4.0	37
43	On Hypermomentum in General Relativity II. The Geometry of Spacetime. Zeitschrift Fur Naturforschung - Section A Journal of Physical Sciences, 1976, 31, 524-527.	1.5	34
44	Volume elements of spacetime and a quartet of scalar fields. Physical Review D, 1998, 58, .	4.7	34
45	Real null coframes in general relativity and GPS type coordinates. Physical Review D, 2002, 65, .	4.7	31
46	Is the Quantum Hall Effect Influenced by the Gravitational Field?. Physical Review Letters, 2004, 93, 096804.	7.8	30
47	Schwarzschild and Kerr solutions of Einstein's field equation: An Introduction. International Journal of Modern Physics D, 2015, 24, 1530006.	2.1	29
48	Possible skewon effects on light propagation. Physical Review D, 2004, 70, .	4.7	28
49	ROTATING BLACK HOLES IN METRIC-AFFINE GRAVITY. International Journal of Modern Physics D, 2006, 15, 635-668.	2.1	28
50	A charged Taub-NUT metric with torsion: A new axially symmetric solution of the poincare gauge field theory. Physics Letters, Section A: General, Atomic and Solid State Physics, 1984, 100, 392-396.	2.1	25
51	Premetric equivalent of general relativity: Teleparallelism. Physical Review D, 2017, 95, .	4.7	25
52	On the theory of the skewon field: from electrodynamics to gravity. Physics Letters, Section A: General, Atomic and Solid State Physics, 2005, 347, 14-24.	2.1	24
53	Dimensions and units in electrodynamics. General Relativity and Gravitation, 2005, 37, 733-749.	2.0	24
54	Extended Einstein's Cartan theory à la Diakonov: The field equations. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 2012, 713, 321-325.	4.1	24

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55	On Kottler's path: Origin and evolution of the premetric program in gravity and in electrodynamics. International Journal of Modern Physics D, 2016, 25, 1640016.	2.1	24
56	Torsion nonminimally coupled to the electromagnetic field and birefringence. Classical and Quantum Gravity, 2003, 20, L185-L191.	4.0	23
57	Computer algebra in gravity: Reduce-Excalc programs for (non-) Riemannian space-times. I. Computer Physics Communications, 1998, 115, 264-283.	7.5	22
58	The Cauchy Relations in Linear Elasticity Theory. Journal of Elasticity, 2002, 66, 185-192.	1.9	22
59	Acceleration-induced nonlocal electrodynamics in Minkowski spacetime. Physics Letters, Section A: General, Atomic and Solid State Physics, 2000, 271, 8-15.	2.1	21
60	Gauge Theory of Gravity and Spacetime. Einstein Studies, 2017, , 145-169.	0.4	21
61	Gravity-Induced Four-Fermion Contact Interaction Implies Gravitational Intermediate W and Z Type Gauge Bosons. International Journal of Theoretical Physics, 2017, 56, 751-756.	1.2	21
62	Premetric teleparallel theory of gravity and its local and linear constitutive law. European Physical Journal C, 2018, 78, 1.	3.9	20
63	Plebanski-Demianski-like solutions in metric-affine gravity. Classical and Quantum Gravity, 1998, 15, 1793-1799.	4.0	19
64	Linear connections with a propagating spin-3 field in gravity. Physical Review D, 2006, 74, .	4.7	19
65	The Kummer tensor density in electrodynamics and in gravity. Annals of Physics, 2014, 349, 297-324.	2.8	18
66	The constitutive tensor of linear elasticity: Its decompositions, Cauchy relations, null Lagrangians, and wave propagation. Journal of Mathematical Physics, 2013, 54, .	1.1	17
67	LIGHT PROPAGATION IN GENERALLY COVARIANT ELECTRODYNAMICS AND THE FRESNEL EQUATION. International Journal of Modern Physics A, 2002, 17, 2695-2700.	1.5	16
68	Light propagation in local and linear media: Fresnel-Kummer wave surfaces with 16 singular points. Physical Review A, 2016, 93, .	2.5	16
69	Mapping Noether identities into Bianchi identities in general relativistic theories of gravity and in the field theory of static lattice defects. International Journal of Theoretical Physics, 1990, 29, 1185-1206.	1.2	15
70	Hypermomentum and the microscopic violation of the Riemannian constraint in general relativity. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 1977, 70, 70-72.	4.1	14
71	GENERALLY COVARIANT FRESNEL EQUATION AND THE EMERGENCE OF THE LIGHT CONE STRUCTURE IN LINEAR PRE-METRIC ELECTRODYNAMICS. International Journal of Modern Physics D, 2002, 11, 1227-1242.	2.1	14
72	Nonlocal Gravitomagnetism. Universe, 2019, 5, 195.	2.5	14

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73	To Consider the Electromagnetic Field as Fundamental, and the Metric Only as a Subsidiary Field. Foundations of Physics, 2005, 35, 2007-2025.	1.3	13
74	Towards a unified gauge theory of gravitational and strong interactions. General Relativity and Gravitation, 1980, 12, 83-90.	2.0	12
75	Constitutive law of nonlocal gravity. Physical Review D, 2019, 99, .	4.7	12
76	Equivalence principle and electromagnetic field: no birefringence, no dilaton, and no axion. General Relativity and Gravitation, 2008, 40, 1239-1248.	2.0	11
77	General relativity as a special case of Poincaré gauge gravity. Physical Review D, 2020, 102, .	4.7	10
78	Electrodynamics of moving magnetoelectric media: Variational approach. Physics Letters, Section A: General, Atomic and Solid State Physics, 2007, 371, 11-19.	2.1	9
79	Electric/magnetic reciprocity in premetric electrodynamics with and without magnetic charge, and the complex electromagnetic field. Physics Letters, Section A: General, Atomic and Solid State Physics, 2004, 323, 169-175.	2.1	7
80	On the boundary-value problems and the validity of the Post constraint in modern electromagnetism. Optik, 2009, 120, 418-421.	2.9	7
81	A remark on the axisymmetric Chen et al. solution of the Poincaré gauge theory. Physics Letters, Section A: General, Atomic and Solid State Physics, 1988, 127, 65-69.	2.1	6
82	Forces and momenta caused by electromagnetic waves in magnetoelectric media. Physics Letters, Section A: General, Atomic and Solid State Physics, 2008, 372, 3946-3952.	2.1	5
83	Comparison of the DeWitt metric in general relativity with the fourth-rank constitutive tensors in electrodynamics and in elasticity theory. General Relativity and Gravitation, 2018, 50, 1.	2.0	5
84	Conservation of Energy-Momentum of Matter as the Basis for the Gauge Theory of Gravitation. Fundamental Theories of Physics, 2020, , 217-252.	0.3	5
85	A micro-deSitter spacetime with constant torsion: A new vacuum solution of the Poincaré gauge field theory. , 1983, , 1-15.		4
86	Black Holes in Two Dimensions. Lecture Notes in Physics, 0, , 289-316.	0.7	4
87	Freud's superpotential in general relativity and in Einstein-Cartan theory. Physical Review D, 2018, 97, .	4.7	4
88	Irreducible decompositions of the elasticity tensor under the linear and orthogonal groups and their physical consequences. Journal of Physics: Conference Series, 2015, 597, 012046.	0.4	3
89	Axion and Dilaton + Metric Emerge Jointly from an Electromagnetic Model Universe with Local and Linear Response Behavior. Fundamental Theories of Physics, 2016, , 77-96.	0.3	3
90	An Assessment of Evans's Unified Field Theory I. Foundations of Physics, 2008, 38, 7-37.	1.3	2

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91	Physical Dimensions/Units and Universal Constants: Their Invariance in Special and General Relativity. Annalen Der Physik, 2019, 531, 1800407.	2.4	2
92	SPACETIME AS A CONTINUUM WITH MICROSTRUCTURE AND METRIC-AFFINE GRAVITY. , 1991, , 31-52.		1
93	An Assessment of Evans's Unified Field Theory. Foundations of Physics, 2008, 38, 38-46.	1.3	1
94	Bahram Mashhoon's 60th birthday. General Relativity and Gravitation, 2008, 40, 881-893.	2.0	1
95	Bahram Mashhoon's 60th birthday. General Relativity and Gravitation, 2008, 40, 1109-1109.	2.0	1
96	Mit Buchstaben auf dem Computer rechnen: Über die Anwendung der Computeralgebra in Mathematik, Naturwissenschaft und Technik. Informatik-Fachberichte, 1992, , 295-303.	0.2	1
97	Mathematics:Some Exterior Calculus. , 2003, , 17-106.		0
98	Axion and dilaton + metric emerge jointly from an electromagnetic model universe with local and linear response behavior. International Journal of Modern Physics D, 2016, 25, 1640015.	2.1	0
99	Generally covariant Maxwell theory for media with a local response: Progress since 2000. , 2016, , .		0
100	Schwarzschild and Kerr solutions of Einstein's field equation: An Introduction. , 2017, , 109-185.		0
101	METRIC-AFFINE GRAVITY. World Scientific Series in 20th Century Physics, 2006, , 517-606.	0.0	0
102	Extension of GR with a gravitational constitutive tensor. , 2022, , .		0