

Curriculum vitae of Friedrich W. Hehl

Name: Univ.-Prof. i.R. Dr. Friedrich W. Hehl

Date of Birth: 26 August 1937

Nationality: German

Academic Degrees: Dipl.-Phys. 1963, Dr.rer.nat. 1965, habilitation in theoretical physics 1971, apl. Prof. 1974

Career summary:

- Lecturer (Univerisätsdozent) TU Clausthal (1971)
- Tenured Professor in Theoretical Physics, *Universitätsprofessor*, Institute for Theoretical Physics, University of Cologne (since 1975)
- *Adjunct Professor* at the Department of Physics and Astronomy, University of Missouri, Columbia, MO 65211, USA (since 2002)
- Research interests: theoretical physics, in particular gravity, general relativity, and gauge theories, field theory, electrodynamics, cosmology; computer algebra; epistemology
- Visiting Cambridge University (1967/68, 1/2 year)
Princeton University (1973/74, 5/4 years)
University of Texas at Austin (1979, 1/2 year; 1983, 1/4 year)
Dublin Institute for Advanced Studies and University College Dublin (1981, 1985, 1987, 2 months each stay)
University of California, Los Angeles (1984/85, 1 year)
Tel Aviv University (1987 and 1990, 2 months each stay)
National Tsing Hua University, Hsinchu, Taiwan (1989, 1/4 year; 2003, 1 month)
Member Institute for Advanced Study, Princeton, N.J. (1999/2000)
University of Kent (Canterbury, UK) (2000, 2 months)
National Central University, Chungli, Taiwan (2009, 2 months)
University of Missouri, Columbia, MO (2009, 2 months)
Lectured at the Collège de France, at Princeton University, at the University of Brasialia, and at many different universities and research institutes

- Longterm scientific collaborations with Yuval *Ne'eman*[†] (Tel Aviv, 1978 to 2006), Dermott *McCrea*[†] (Dublin, 1981 to 1993), Alfredo *Macías* (Mexico City, since 1995), Yakov *Itin*/Shmuel *Kaniel* (Jerusalem, since 1997), and with J. Wahid *Maluf* (Brasilia, since 2000)
- Has written papers for *Annalen der Physik*, *Annales des Institut Henri Poincaré*, *Annales de la Fondation Louis de Broglie*, *Annals of Physics*, *Classical and Quantum Gravity*, *Foundations of Physics*, *General Relativity and Gravitation Journal*, *International Journal of Theoretical Physics*, *Journal of Elasticity*, *Journal of Mathematical Physics*, *Nuclear Physics B*, *Nuovo Cimento B*, *Physical Review A and D*, *Physical Review Letters*, *Physics Letters A and B*, *Physics Reports*, *Reports on Mathematical Physics*, *Physikalische Blätter*, *Zeitschrift für Physik*, *Zeitschrift für Naturforschung*
- Former member of the editorial committee of “Il Nuovo Cimento B” (till 2002), Co-Editor of “Annalen der Physik”
- Several lectures on relativity and gravity in Erice-Proceedings 1979 and 1995 (Plenum Press) and in Bad Honnef-Proceedings 1990 and 1991 (Springer Verlag)
- Coauthor of a book (in German) on Computer-Algebra (1992), coauthor of a book (in English) on Computer Simulation and Computer Algebra (1993, 3rd edition)
- New book of 400 pages: F.W. Hehl and Yu.N. Obukhov: Foundations of Classical Electrodynamics — Charge, Flux, and Metric. Birkhäuser, Boston (2003)
- Member German Physical Society (DPG, chair of GRG section 1994-2000), American Physical Society (APS), International Society for General Relativity and Gravitation (GRG-Society)
- (Co-)organizer of several summer schools on general relativity and related issues at the Physics Center of the German Physical Society in Bad Honnef, Germany in 1995, 1996, 1997, 1999, and 2001 (see publication list)
- My publications can be found under

<http://www.thp.uni-koeln.de/gravitation/>

Group members, Hehl

- Friedrich W. Hehl has written well over 150 original publications on issues of theoretical physics, in particular classical gravity, field theory, foundations of electrodynamics, and elasticity theory. He authored, co-authored, or co-edited about 7 books.

Some recent publications since 2003:¹

References

- [1] F. W. Hehl and Yu. N. Obukhov, *Foundations of classical electrodynamics: Charge, flux, and metric* (Birkhäuser: Boston, 2003) *Progress in Mathematical Physics*, vol. **33**, 430 pp.
- [2] A. A. Garcia, F. W. Hehl, C. Heinicke and A. Macias, *Exact vacuum solution of a (1+2)-dimensional Poincare gauge theory: BTZ solution with torsion*, *Phys. Rev. D* **67** (2003) 124016 [arXiv:gr-qc/0302097].
- [3] Y. N. Obukhov and F. W. Hehl, *Electromagnetic energy-momentum and forces in matter*, *Phys. Lett. A* **311** (2003) 277 [arXiv:physics/0303097].
- [4] G. F. Rubilar, Y. N. Obukhov and F. W. Hehl, *Torsion nonminimally coupled to the electromagnetic field and birefringence*, *Class. Quant. Grav.* **20** (2003) L185 [arXiv:gr-qc/0305049].
- [5] Y. Itin and F. W. Hehl, *Maxwell's field coupled nonminimally to quadratic torsion and induced axion field*, *Phys. Rev. D* **68** (2003) 127701 [arXiv:gr-qc/0307063].
- [6] A. Garcia, F. W. Hehl, C. Heinicke and A. Macias, *The Cotton tensor in Riemannian spacetimes*, *Class. Quant. Grav.* **21** (2004) 1099 [arXiv:gr-qc/0309008].
- [7] F. W. Hehl, Y. N. Obukhov and B. Rosenow, *Is the Quantum Hall Effect influenced by the gravitational field?*, *Phys. Rev. Lett.* **93** (2004) 096804 [arXiv:cond-mat/0310281].
- [8] Y. Itin and F. W. Hehl, *Is the Lorentz signature of the metric of space-time electromagnetic in origin?*, *Annals Phys.* **312** (2004) 60 [arXiv:gr-qc/0401016].

¹A complete publication list can be downloaded from <http://www.thp.uni-koeln.de/gravitation/>.

- [9] F. W. Hehl and Y. N. Obukhov, *Electric/magnetic reciprocity in premetric electrodynamics with and without magnetic charge, and the complex electromagnetic field*, Phys. Lett. A **323** (2004) 169 [arXiv:physics/0401083].
- [10] F. W. Hehl and Y. N. Obukhov, *To consider the electromagnetic field as fundamental, and the metric only as a subsidiary field*, Found. Phys. **35** (2005) 2007 [arXiv:physics/0404101].
- [11] F. W. Hehl and Y. N. Obukhov, *Dimensions and units in electrodynamics*, Gen. Rel. Grav. **37** (2005) 733 [arXiv:physics/0407022].
- [12] C. Lämmerzahl and F. W. Hehl, *Riemannian light cone from vanishing birefringence in premetric vacuum electrodynamics*, Phys. Rev. D **70** (2004) 105022 [arXiv:gr-qc/0409072].
- [13] F. W. Hehl and Y. N. Obukhov, *Linear media in classical electrodynamics and the Post constraint*, Phys. Lett. A **334** (2005) 249 [arXiv:physics/0411038].
- [14] Y. N. Obukhov and F. W. Hehl, *On possible skewon effects on light propagation*, Phys. Rev. D **70** (2004) 125015 [arXiv:physics/0409155].
- [15] C. Heinicke, P. Baekler and F. W. Hehl, *Einstein-aether theory, violation of Lorentz invariance, and metric-affine gravity*, Phys. Rev. D **72** (2005) 025012 [arXiv:gr-qc/0504005].
- [16] Y. N. Obukhov and F. W. Hehl, *Measuring a piecewise constant axion field in classical electrodynamics*, Phys. Lett. A **341** (2005) 357 [arXiv:physics/0504172].
- [17] F. W. Hehl, Yu. N. Obukhov, G. F. Rubilar and M. Blagojevic, *On the theory of the skewon field: From electrodynamics to gravity*, Phys. Lett. A **347** (2005) 14 [arXiv:gr-qc/0506042].
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- [21] P. Baekler and F. W. Hehl, *Rotating black holes in metric-affine gravity*, Int. J. Mod. Phys. D **15** (2006) 635 [arXiv:gr-qc/0601063].
- [22] P. Baekler, N. Boulanger and F. W. Hehl, *Linear connections with propagating spin-3 field in gravity*, Phys. Rev. D **74** (2006) 125009 [arXiv:hep-th/0608122].
- [23] F. W. Hehl, *An assessment of Evans' unified field theory I*, Found. Phys. **38** (2008) 7 [arXiv:physics/0703116].
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- [25] F. W. Hehl and Yu. N. Obukhov, *Equivalence principle and electromagnetic field: no birefringence, no dilaton, and no axion*, Gen. Rel. Grav. **40** (2008) 1239 [arXiv:0705.3422 [gr-qc]].
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- [28] F. W. Hehl and Y. N. Obukhov, *Elie Cartan's torsion in geometry and in field theory, an essay*, Ann. FondL. de Broglie **32** (2007) 157 [arXiv:0711.1535].
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- [31] F. W. Hehl and B. Mashhoon, *Nonlocal Gravity Simulates Dark Matter*, Phys. Lett. B **673** (2009) 279 [arXiv:0812.1059] [gr-qc].

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