

Author: Assoc. Prof. Dr. Nicoleta VOICU

Habilitation thesis title: Geometric Methods of Finsler-Based Field Theory

Domain: Mathematics

LIST OF PUBLICATIONS

RELEVANT WORKS

1. M. Hohmann, C. Pfeifer, **N. Voicu**, *Mathematical foundations for field theories on Finsler spacetimes*, Journal of Mathematical Physics 63, 032503 (2022), <https://aip.scitation.org/doi/10.1063/5.0065944> .
2. **N. Voicu**, S. Garoiu, B. Vasian, *On the closure property of Lepage equivalents of Lagrangians*, Differential Geometry and its Applications 81, 101852 (2022), <https://www.sciencedirect.com/science/article/abs/pii/S0926224522000055> .
3. M. Hohmann, C. Pfeifer, **N. Voicu**, *Canonical variational completion and 4D Gauss–Bonnet gravity*, European Physical Journal Plus 136, 180 (2021), <https://link.springer.com/article/10.1140/epjp/s13360-021-01153-0> .
4. N. Minculete, C. Pfeifer, **N. Voicu**, *Inequalities from Lorentz–Finsler norms*, Mathematical Inequalities and Applications 24(2), 373–398 (2021), <http://mia.ele-math.com/24-26/Inequalities-from-Lorentz-Finsler-norms> .
5. **N. Voicu**, C. Pfeifer: Chapter 15, *Finsler Gravity*, in vol. *Modified Gravity and Cosmology*, Springer, 2021: ISBN 978-3-030-83715-0, https://link.springer.com/chapter/10.1007/978-3-030-83715-0_15 .
6. M. Hohmann, C. Pfeifer, **N. Voicu**, *Relativistic kinetic gases as direct sources of gravity*, Physical Review D 101, 024062 (2020), <https://journals.aps.org/prd/abstract/10.1103/PhysRevD.101.024062> .
7. M. Hohmann, C. Pfeifer, **N. Voicu**, *The kinetic gas universe*, European Physical Journal C 80, 809 (2020), <https://link.springer.com/article/10.1140/epjc/s10052-020-8391-y> .
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9. A. Fuster, S. Heefer, C. Pfeifer, **N. Voicu**, *On the non metrizable of Berwald Finsler spacetimes*, Universe 6 (5), 64 (2020), <https://www.mdpi.com/2218-1997/6/5/64> .
10. M. Hohmann, C. Pfeifer, **N. Voicu**, *Finsler gravity action from variational completion*, Physical Review D 100, 064035 (2019), <https://journals.aps.org/prd/abstract/10.1103/PhysRevD.100.064035> .
11. **N. Voicu**, *Conformal maps between pseudo–Finsler spaces*, International Journal of Geometric Methods in Modern Physics 15(01), 1850003 (2018), <https://www.worldscientific.com/doi/10.1142/S0219887818500032> .
12. **N. Voicu**, *Volume forms for time orientable spacetimes*, Journal of Geometry and Physics 112 (2017) 85–94, <https://www.sciencedirect.com/science/article/pii/S0393044016302741> .

13. **N. Voicu**, *Energy-momentum tensors in classical field theories – a modern perspective*, International Journal of Geometric Methods in Modern Physics, 13, 1640001 (2016), <https://www.worldscientific.com/doi/abs/10.1142/S0219887816400016> .
14. **N. Voicu**, D. Krupka, *Canonical variational completion of differential equations*, Journal of Mathematical Physics 56, 043507 (2015), <https://aip.scitation.org/doi/10.1063/1.4918789> .
15. **N. Voicu**: Chapter 5, *Source Forms and Their Variational Completions*, in vol. *The Inverse Problem of the Calculus of Variations - Local and Global Theory*, ed. Dmitri Zenkov, Atlantis Press- Springer, 2015, ISBN 978-94-6239-109-3, https://link.springer.com/chapter/10.2991/978-94-6239-109-3_5 .
16. **N. Voicu**, *Biharmonic curves in Finsler spaces*, Journal of Korean Mathematical Society 51 (6), 1105–1122 (2014), <https://koreascience.kr/article/JAKO201432252667187.kr&sa=U> .
17. **N. Voicu**, *Biharmonic maps from Finsler spaces*, Publicationes Mathematicae Debrecen, 84 / 3-4 (4) (2014), https://publi.math.unideb.hu/load_doc.php?p=1872&t=pap .
18. **N. Voicu**, *Tidal tensors in the description of gravity and electromagnetism*, Journal of Nonlinear Mathematical Physics 19, 1250018 (2012), <https://www.worldscientific.com/doi/10.1142/S1402925112500180> .
19. **N. Voicu**, *On the fundamental equations of electromagnetism in Finslerian spacetimes*, Progress In Electromagnetics Research, Vol. 113, 83-102 (2011), <https://www.jpier.org/PIER/pier.php?paper=10122108>

PHD THESIS

N. Voicu, *Deviations of Geodesics in Second Order Geometry*, Babeş-Bolyai Univ., Cluj-Napoca, Romania, 2003.

BOOKS / BOOK CHAPTERS

I. International publishers:

1. **N. Voicu**, C. Pfeifer: Ch. 15, *Finsler Gravity*, in vol. *Modified Gravity and Cosmology*, Springer, 2021: ISBN 978-3-030-83715-0.
2. **N. Voicu**: Ch. 5, *Source Forms and Their Variational Completions*, in vol. *The Inverse Problem of the Calculus of Variations - Local and Global Theory*, ed. Dmitri Zenkov, Atlantis Press-Springer, 2015, ISBN 978-94-6239-109-3.
3. Balan V., Rahula M., **Voicu N.**, *Tangent Structures in Geometry and Their Applications*, Editorial URSS Publishers, 2013, ISBN 978-5-396-00588-4.
4. Atanasiu, Gh., Balan, V., **Brînzei, N.**, Rahula, *Differential-Geometric Structures - Tangent Fibrations, Connections in Bundles, Exponential Law and Jet Spaces* (in Russian), Editorial URSS Publishers, 2010, ISBN 978-5-397-00254-7.
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II. National publishers:

1. Stoica, E., Purcaru, M., Brînzei, N, *Linear Algebra, Analytic Geometry, Differential Geometry*, Ed. Univ. Transilvania, Brasov, 2008, ISBN 978-973-598-441-0.
2. Brînzei, N, *Geodezice și câmpuri Jacobi în geometria de ordin doi*, Ed. Univ. Transilvania din Brașov, 2007, ISBN 978-973-598-027-6.
3. Atanasiu, Gh., Stoica, E., Brînzei, N: *Curbe și suprafețe*, MatrixRom, București, 2005, ISBN 973-685-979-7.

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I. Papers in ISI Web of Knowledge journals:

1. M. Hohmann, C. Pfeifer, N. Voicu, *Mathematical foundations for field theories on Finsler spacetimes*, Journal of Mathematical Physics 63, 032503 (2022).
2. N. Voicu, S. Garoiu, B. Vasian, *On the closure property of Lepage equivalents of Lagrangians*, Differential Geometry and its Applications 81, 101852 (2022).
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12. N. Voicu, *Energy-momentum tensors in classical field theories – a modern perspective*, International Journal of Geometric Methods in Modern Physics, 13, 1640001 (2016).
13. V. Balan, M. Rahula, N. Voicu, *Iterative calculus on tangent floors*, Analele Șt. Univ. "Ovidius" Constanța – Seria Matematică, vol 24 (1), 121–152 (2016).
14. N. Voicu, D. Krupka, *Canonical variational completion of differential equations*, Journal of Mathematical Physics 56, 043507 (2015).
15. N. Voicu, *Biharmonic curves in Finsler spaces*, Journal of Korean Mathematical Society 51 (6), 1105–1122 (2014).

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2. **N. Voicu**, *On a new unified geometric description of gravity and electromagnetism*, BSG Proceedings 19, 163-176, (2012).
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4. **N. Brinzei**, *On cubic Berwald spaces*, Rev. Bull. Calcutta Math. Society 17(1-2), 75-84 (2009).
5. **N. Brinzei**, *Projective relations for m -th root metric spaces*, Journal of the Calcutta Mathematical Society 5(1-2), 21-35 (2009).
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10. Atanasiu, Gh., **Voicu N.**, *Lifts of the Almost Complex Structures to $T(\text{Osc}^2M)$* , Novi Sad J. Math. 29(3), 35-53 (1999).

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1. **N. Voicu**, *Equations of electromagnetism in some special anisotropic spaces. Part 2*, Hypercomplex Numbers in Geometry and Physics 2 (14), Vol 7, 61-72 (2010).
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3. **N. Brinzei**, S.V. Siparov, *On the possibility of the OMPR effect in the space with Finsler geometry (Part II)*, Hypercomplex Numbers in Geometry and Physics 2 (10), Vol 5, 56-63 (2008).

4. Gh. Atanasiu, **N. Brinzei**, *Einstein equations for the homogeneous prolongation of a Finsler metric to the tangent bundle*, Hypercomplex Numbers in Geometry and Physics 2(8), vol. 4, 53-64 (2007).
5. **N. Brinzei**, S.V. Siparov, *On the possibility of the OMPR effect in the space with Finsler geometry*, Hypercomplex Numbers in Geometry and Physics 2(8), vol. 4, 41-52 (2007).
6. Balan, V., **Brinzei, N.**, Lebedev, S., *Geodesics, connections and Jacobi fields for Berwald-Moor quartic metrics*, Hypercomplex Numbers in Geometry and Physics 2 (6), Vol 3, 113-122 (2006).
7. Atanasiu, Gh., **Brinzei, N.**: *The Berwald-Moor metric in the tangent bundle of second order*, Hypercomplex Numbers in Geometry and Physics, 2(4), 114-122 (2005).
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PAPERS IN INTERNATIONAL CONFERENCE PROCEEDINGS

I. ISI proceedings:

1. M. Rahula, Petr Vasik, **N. Voicu**, *Tangent structures: sector-forms, jets and connections*, Journal of Physics: Conference Series (JPCS) 346 (ed. Viktor Abramov), 012023 (2012).
2. **N. Voicu**, *New considerations on Einstein equations in pseudo-Finsler spaces*, AIP Conf. Proceedings 1283 (ed. Manuel de León, D. M. de Diego, R. M. Ros), 249-257 (2010).
3. **N. Voicu**, S.V. Siparov, *A new approach to electromagnetism in anisotropic spaces*, BSG Proceedinds 17, 235-245 (Proc. of International Conference on Differential Geometry and Dynamical Systems (DGDS), Bucharest, 2009, eds. Udriste C; Balan V) (2010).
4. **N. Voicu-Brinzei**, S. Siparov, *Mathematical formalism for an experimental test of the space-time anisotropy*, AIP Conf. Proceedings 1206 (ed.: Sandip K. Chakrabarti , Al.I. Zhuk, Gennady S. Bisnovatyi-Kogan), 152-162 (2009).

II. Other international conference proceedings:

1. **N. Voicu**, *Biharmonic maps between Finsler spaces*, Proc. of the 47-th Symposium on Finsler Geometry Nov. 23 - Nov. 25, 2012, Kagoshima, Japan.
2. **N. Voicu**, *Finslerian connections and the equations of spinning charged particles in General Relativity*, Proc. of 11th Int. Conf. of Applied Mathematics, Bratislava, Feb. 7th – 9th, 2012.
3. **N. Voicu**, *Tangent bundle geometry and a unified description of gravity and electromagnetism*, Proc. of the Int. Conf. "Riemannian Geometry and Its Applications", București, 2011.
4. **N. Voicu-Brinzei**, *Anisotropy and analogies between gravity and electromagnetism*, Proc. of Int. Conf. "Physical Interpretations of Relativity Theory", Moscova, 2009, pp. 124-132.
5. Atanasiu, Gh., **Brinzei, N.**, *Einstein equations in the higher order differential geometry*, Proc. of int. Meeting "Physical Interpretations of Relativity Theory", 4.07-7.07.2005, Bauman Moscow St. Tech. Univ., pp. 255-262

OTHER PAPERS / RELEVANT ACHIEVEMENTS

Editorial material: N. Voicu, *Preface, Special Finsler Issue*, International Journal of Geometric Methods in Modern Physics, 16, supp02 (November 2019).

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Author:

Nicoleta VOICU

