Curriculum vitae & List of publications

Alexandru Kristály (Mathematics)

A) Birth date and place: 22 March 1975, Bălan (România).

B) Bachelor degree: Babes-Bolyai University, Department of Mathematics and Informatics, Cluj-Napoca, Romania, 1993-1997.

C) Master degree: Babes-Bolyai University, Department of Mathematics and Informatics, Cluj-Napoca, Romania, 1997-1998.

D1) PhD degree (first): Babes-Bolyai University, Department of Mathematics and Informatics, Cluj-Napoca, Romania, 2003. Title of thesis: *Critical and equilibrium points for set-valued maps*. Scientific advisor: Prof. Wolfgang W. Breckner.

D2) PhD degree (second): University of Debrecen, Institute of Mathematics and Informatics, Debrecen, Hungary, 2005. Title of thesis: *Non-smooth critical point theories with applications in elliptic problems and the theory of geodesics*. Scientific advisor: Prof. Laszlo Kozma.
Habilitations:

- Babeş-Bolyai University, Faculty of Mathematics and Informatics, Cluj-Napoca, 6 September 2013. Title of dissertation**:** *Elliptic problems via critical point theory*.
- Óbuda University, Budapest, 24 September 2015. Title of dissertation**:** *Anisotropic versus isotropic phenomena: a geometric approach.*

E) Current position: Full Professor (2013-present), Babes-Bolyai University, Cluj-Napoca.

F) Awards & distinctions (selected):

- External Member of the Hungarian Academy of Sciences, elected in 2025.
- Arany János Prize, Hungarian Academy of Sciences, Budapest, Hungary, 2021.
- Ad Astra Award, Bucharest, Romania, 2020.
- Spiru Haret Award, Romanian Academy, Bucharest, Romania, 2014.
- Bolyai Plakett, Hungarian Academy of Sciences, Budapest, Hungary, 2013.

G) Invitations and fellowships (selected):

1. **Visiting professor**, University of Oxford, Mathematical Institute, UK, May 2023 & July 2024.
2. **Visiting professor,** Universitat Bern (1-15 December 2010, 1-15 May 2011, 15 November-31 December 2011, 1-30 November 2012, 1-31 October 2013, 1-12 December 2014, 11-31 October 2015; 1-30 November 2016, 1-30 November 2019, 15-30 October & 15-30 November 2021, 15-30 October 2024).
3. **Senior Research Fellow**, City University of Hong Kong, Hong Kong (21 September-21 October 2014, 1-31 March 2015).
4. **Visiting professor**, University of Kyoto, Kyoto, Japan (1-15 October 2012).

5. **Professori Visitatori**, INDAM (Istituto Nazionale di Alta Matematica), University of Catania, Catania, Italy (1 June-30 July 2005, 8-22 January 2011 and 1-15 September 2009).
6. **Visiting professor**, IHES (Institute des Hautes Etudes Scientifiques), Bures-sur-Yvette (near Paris), France (15 March-15 April 2011 and 6 May-6 June 2013).
7. **J. Bolyai Research Fellowship,** Hungarian Academy of Sciences, Budapest, Hungary, 2009-2012 and 2013-2016.
8. **Junior Research Fellowship**, Central European University, Special and Extension Programs, Budapest, Hungary, (1 November 2005 – 31 January 2006).
9. **Domus Hungarica**, Hungarian Academy of Sciences, University of Debrecen, Debrecen, Hungary, 3 months in 2005 and 2006.
10. **« Two weeks on Global Analysis »**, Centro di Ricerca Matematica Ennio De Giorgi, Scuola Normale Superiore, Pisa, 13 – 23 February 2005.
11. **Young Researcher**, Geometrical Analysis, EU Research Training Network PRN-CT-999-00118/2000-2004, Institute of Mathematics of the Polish Academy of Sciences, Stefan Banach Center, Warsaw, Poland, 4 months (1 June – 31 August 2003, and 20 January – 20 February 2004).

H) Editorial activity. Member in the Editorial Boards of:

- *Journal of Optimization Theory and Applications, Springer;*
- *Applied Mathemtics Letters, Elsevier;*
- *Studia Universitatis Babes-Bolyai, Mathematica;*
- *Analele Universitatii din Timisoara, Seria Matematica (De Gruyter);*
- *Acta Universitatis Sapientiae, Mathematica, Springer.*

Referee for the journals*: J. Eur. Math. Soc., Trans. AMS, Proc. AMS, Journal of Functional Analysis*, *Journal of Mathematical Analysis and Applications; Journal of Global Optimization; Journal of Optimization Theory and Applications; Nonlinear Analysis, Theory, Methods and Applications; Proceedings of the Edinburgh Mathematical Society; Glasgow Mathematical Journal; Acta Mathematica Hungarica; Applicable Analysis; Applied Mathematics Letters; Taiwanese Journal of Mathematics, etc.*

I) Conferences, congresses, talks (selected):

1. Winter School on Abstract Analysis, Lhota nad Rohanovem, Czech Republic, 3-10 February, 2001. (Presented: Coerciveness property for a class of set-valued mappings).
2. Kossuth Lajos University, Department of Mathematics, Debrecen, Hungary, 12 May, 2002 (Presented: Set-valued versions of Ky Fan's minimax inequality with applications).
3. University of Szeged, Department of Mathematics, Szeged, Hungary, 21 September, 2002 (Presented: A metric property for Berwald spaces of non-positive flag curvature).
4. International Conference in Nonlinear Differential Equations and Applications (ICNODEA), Cluj-Napoca, 22-27 August, 2004 (Presented: Multiplicity results for an eigenvalue problem for hemivariational inequalities in strip-like domains).
5. University of Messina, Messina, Italy, 12 June, 2005 (Presented: Multiple solutions of certain elliptic problems on unbounded strips).

6. University of Reggio Calabria, Reggio Calabria, Italy, 13 June, 2005 (Presented: Infinitely many homoclinic solutions for an elliptic problem in R^N).
7. The 22th IFIP TC 7 Conference on System Modelling and Optimization, 18-22 July, 2005, Politecnico di Torino, Italy. (Presented: Infinitely many solutions for a differential inclusion problem in R^N).
8. *Invited main speaker* at The 5th ISAAC Congress, 25-30 July, 2005, University of Catania, Italy. (Presented: Elliptic eigenvalue problems on unbounded domains involving sublinear terms).
9. Central European University, Budapest, Hungary, 7 December, 2005 (Presented: Multiple solutions of sublinear elliptic problems in R^N).
10. Central European University, Budapest, Hungary, Mini-workshop: Recent advances in calculus of variations, 30 April – 7 May, 2006. (Presented: One-dimensional scalar field equations involving an oscillatory nonlinear term).
11. Adam Mickiewicz University, Poznan, Poland, 20 June, 2006. (Presented: Infinitely many solutions for an one-dimensional scalar field equation).
12. University of Rousse, Rousse, Bulgaria, 1 August, 2006. (Presented: Nonradial sign changing solutions for quasilinear elliptic equations).
13. Central European University, Budapest, Hungary, Mini-workshop: Some Advances in Applied Mathematics, 25-29 September, 2006. (Presented: Quasilinear elliptic problems with oscillatory nonlinearities).
14. University of Perpignan, Perpignan, France, 27 March, 2007. (Presented: Sublinear eigenvalue problems on compact Riemannian manifolds).
15. Workshop "Topological and variational methods for differential equations", University of Rousse, Rousse, Bulgaria, 7-11 May, 2007. (Presented: Sublinear eigenvalue problems on compact Riemannian manifolds with applications in Emden-Fowler equations).
16. "International Workshop on Applied Evolution Equations", Central European University, Budapest, Hungary, 21-25 May, 2007. (Presented: Homoclinic solutions for an elliptic problem in R^N with oscillatory terms).
17. Universita di Messina, Italy, 26 June 2007. (Presented: Sublinear eigenvalue problems on compact Riemannian manifolds).
18. Universita di Catania, Italy, 28 June 2007. (Presented: Asymptotically critical problems on spheres).
19. International Conference in Nonlinear Differential Equations and Applications (ICNODEA), Cluj-Napoca, 3-8 July 2007. (Presented: Elliptic problems in R^N involving oscillatory nonlinearities).
20. Workshop on "Critical Point Theory and its Applications", Babes-Bolyai University, Cluj-Napoca, 9-14 July, 2007. (Presented: Asymptotically critical problem on higher dimensional spheres).
21. Central European University, Department of Mathematics and its Applications, Budapest, 2 October 2008. (Presented: Best approximation problems on Finsler-Riemann manifolds).
22. Spring School in Nonlinear Partial Differential Equations, Louvain-la-Neuve, Belgium, 26-30 May 2008. (Presented: Detection of arbitrarily many solutions for perturbed elliptic problems involving oscillatory terms).
23. Universita di Messina, Italy, 10 September 2009. (Presented: Arbitrary many solutions for a perturbed problem).
24. Universita di Catania, Italy, 14 September 2009. (Presented: On a new class of elliptic systems with nonlinearities of arbitrary growth).
25. Eotvos Lorand University, Budapest, Hungary, 19 November 2009. (Presented : Metric projections and Nash equilibrium points on manifolds, in Hungarian).

26. The 7th Bolyai-Gauss-Lobachevsky Conference, International Conference on Non-Euclidean Geometry and its Applications, Cluj-Napoca, Romania, 5-9 July 2010. (Presentes : Nash-Stampacchia equilibrium points on Riemannian manifolds).
27. Institute of Mathematics "Simion Stoilow" of the Romanian Academy, Bucharest, Romania, Monthly Seminar Series. 17 November 2010 (Presented: Elliptic problems involving oscillatory nonlinearities).
28. University of Bern, Bern, Switzerland, 7 December 2010 (Presented : Nash-type equilibria on Riemannian manifolds).
29. Universita di Messina, Messina, Italy, 13 January 2011. (Presented: Multiple solutions for an elliptic equation on the whole space).
30. Universita di Catania, Catania, Italy, 20 January 2011. (Presented: A dimension-depending multiplicity result for the Schrödinger equation).
31. International Conference on Nonlinear Operators, Differential Equations and Applications, Cluj-Napoca, Romania, 5-8 July 2011. (Invited speaker). (Presented : Anisotropic elliptic problems involving asymmetric Minkowski norms).
32. Budapest University of Technology and Economics, Budapest, Hungary, 15 September 2011. (Presented: Symmetrization principles in elliptic variational problems isotropic and anisotropic phenomena).
33. Debrecen University, Debrecen, 9 March 2012. (Presented: Nash egyensúlypontok Riemann sokaságokon).
34. University of Rousse, Rousse, Bulgaria. 4 October 2012. (Presented: Anisotropic problems in the presence of asymmetric norms).
35. University of Kyoto, Kyoto, Japan. 9 October 2012. (Presented: Caffarelli-Kohn-Nirenberg inequalities on Finsler manifolds).
36. King Fahd University of Petroleum&Minerals, Dammam, Szaud-Arabia, 30 April 2013. (Presented: Nash-type equilibria on Riemannian manifolds).
37. Universite Paris-Sud, Orsay, Paris, France, 30 May 2013. (Presented: Caffarelli-Kohn-Nirenberg inequalities on metric measure spaces: symmetrization and rigidity).
38. 14th IEEE International Symposium on Computational Intelligence and Informatics, Obudai Egyetem, Budapest. 19-21 November 2013. Workshop: Analytical and Geometrical Methods for Solving Engineering Problems. (Presented: Heisenberg uncertainty principles on Riemann-Finsler manifolds: the effect of curvature).
39. ICMC - Summer Meeting on Differential Equations (2014 Chapter), Sao Paulo, 3-7 February 2014. (Presented: Caffarelli-Kohn-Nirenberg inequalities on metric measure spaces: symmetrization and rigidity).
40. SACI 2014, Timisoara, Romania,15-17 May. (Presented: Geometric aspects of non-positively curved spaces).
41. ALEL2014-International Conference on Optimization, Seville, Spain, 5-7 June 2014. Invited speaker. (Presented: Nash-type equilibria on Riemannian manifolds: the effect of curvature).
42. The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, 7-11 July 2014, Madrid, Spain. Invited speaker. (Presented: A variational approach to Nash equilibria on Riemannian manifolds).
43. MAnET Workshop on Sub-Riemannian Analysis, PDE and Applications, Bern, Switzerland, 26-30 January 2015. Invited speaker. (Presented: Functional inequalities on metric measure spaces with applications). Link: **http://kingasipos.wix.com/manetbern#!speakers/c24dg**
44. Workshop "Advances in Game Theory", Reggio Calabria, Italy, 7 May 2015. Invited speaker. (Presented: Geometric aspects of Nash equilibria: the influence of the curvature).

http://www.cn24tv.it/news/111462/workshop-advances-in-game-theory-a-reggio-calabria.html

45. The Eighth Congress of Romanian Mathematicians, Iasi, Romania, 26 June-1 July 2015. Invited speaker. (Presented: Gagliardo-Nirenberg inequalities on manifolds: the influence of the curvature). **http://www.math.uaic.ro/cmr2015/index.php?talks**
46. ICNODEA (International Conference on Nonlinear Operators, Differential Equations and Applications), Cluj-Napoca, 14-17 July 2015. Invited speaker. (Presented: Poisson equations on Finsler-Hadamard manifolds). **http://www.cs.ubbcluj.ro/~icnodeacj/**
47. University of Santiago de Compostela, Santiago de Compostela, Spain, 7 September 2016. (Presented: Gagliardo-Nirenberg inequalities on metric measure spaces: volume non-collapsing and rigidities).
48. The 2016 International Conference Applied Mathematics, Computational Science and Systems Engineering, Rome, Italy, 5-7 November 2016. Plenary Speaker. (Presented: Anisotropic Versus Isotropic Phenomena in Elliptic Problems: A Geometric Approach).
49. Workshop on Nonlinear Analysis on the Occasion of the 65th Birthday of Patrizia Pucci, Cluj-Napoca, Romania, 25-27 May 2017. Invited speaker. (Presented: Sharp uncertainty principles on Riemannian manifolds: the effect of curvature).
50. 23rd Rolf Nevanlinna Colloquium, Zurich, Switzerland, 12-16 June 2017. Session speaker. (Presented: Intrinsic Jacobian determinant inequalities on corank 1 Carnot groups).
51. XII International Symposium on Generalized Convexity and Monotonicity, Hajdúszoboszló (Hungary), 27 August – 2 September 2017. Plenary Speaker. (Presented: Convexity vs. Curvature).
52. 6th International Conference on Mathematics and Informatics, Târgu-Mureş/Marosvásárhely, Romania, 7-9 September 2017. Plenary Speaker. (Presented: Intrinsic geometric inequalities on sub-Riemannian structures).
53. XIV-ème colloque franco-roumain de mathématiques appliquées, Université de Bordeaux, Bordeaux, France, 27-31 August 2018. Plenary Speaker. (Presented: Geometric inequalities: Riemannian vs sub-Riemannian).
54. International Conference in Nonlinear Analysis and Boundary Value Problems 2018, University of Santiago de Compostela, Santiago de Compostela, Spain, 4-7 September 2018. Session Speaker. (Presented: Nodal solutions for the fractional Yamabe problem on Heisenberg groups).
55. Workshop "Geometry and Probability", Fukuoka, Japan, 29 January-2 February 2019. Invited speaker. (Presented: Geometric interpolation inequalities on Heisenberg/Carnot groups).
56. Algebraic Geometry and Differential Topology Seminar, Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, Budapest, Hungary, 6 March 2019. Invited speaker. (Presented**:** Sharp geometric inequalities via optimal mass transportation: Riemannian versus sub-Riemannian).
57. 2019 Szeged Workshop on Convexity, Bolyai Institute, University of Szeged, Szeged, Hungary, 5-6 April 2019. (Presented: Equality in geometric inequalities via optimal mass transportation: how to get convexity?)
58. International Conference on Fluids and Variational Methods, Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, Budapest, Hungary, 10-14 June 2019. Invited speaker. (Presented: Brunn-Minkowski and entropy inequalities: from Riemannian to sub-Riemannian).
59. 30th European conference on operational research, Dublin, Ireland, 23 – 26 June 2019. (Presented: Equality in Riemannian geometric inequalities via optimal mass transportation).
60. Optimization online webinar, 3 December 2020. (Presented: Geodesic convexities in optimization: (wrong) notions and applications).

61. Durham online Analysis and PDE seminar, 10 December 2021. (Presented: Sharp isoperimetric and Sobolev inequalities in spaces with nonnegative Ricci curvature).
62. Special Session at the 2022 Spring Sectional Meeting of the AMS, Purdue University: "Differential Operators: Spectral Estimation and Optimization", 26-27 March 2022. (Presented: Clamped plates in curved spaces).
63. AMS special session "Geometric and Functional Inequalities and Applications to PDEs", 14-15 May 2022. (Presented: Sharp isoperimetric and Sobolev inequalities in spaces with nonnegative Ricci curvature).
64. Partial Differential Equations Seminar, University of Oxford, Mathematical Institute, UK, 15 May 2023. (Presented: Lord Rayleigh's conjecture for clamped plates in curved spaces).
65. Colloquium on Finsler Geometry and its Applications, University of Debrecen, Hungary, 12-16 June 2023. (Presented: Sharp geometric and functional inequalities on Finsler manifolds).
66. 20th EUROpt Workshop: continuous optimization working group is coming home, Corvinus University of Budapest, Hungary, 23-25 August 2023. (Presented: Sharp isoperimetric and Sobolev inequalities on CD(0,N) spaces: an optimal mass transport approach).
67. International Conference on Variational Analysis and Optimization with Applications, Aligarh Muslim University, Aligarh, India, 23-25 September 2023. (Presented: Optimal mass transport approach to sharp geometric inequalities on curved structures).
68. Analysis & Geometry Day, Durham University, Durham, UK, 20 March 2024. (Presented: *Lord Rayleigh's conjecture for clamped plates: the influence of curvature)*.
69. 33rd European Conference on Operational Research, Technical University of Denmark (DTU), Copenhagen, Denmark, 30th June – 3rd July 2024. (Presented: *Sharp functional inequalities on metric measures spaces via optimal transport theory)*.
70. Instituto de Matemática e Estatística (IME) Federal University of Goiás Goiânia, Brazil, 12 September 2024. (Presented: *From Optimal Transportation to Sharp Geometric Inequalities: Euclidean vs. non-Euclidean).*
71. The 14th AIMS Conference on dynamical systems, differential equations and applications,(Organizer of the special session *Nonlinear Differential Problems on Flat and Curved Structures: Variational and Topological Methods*), Abu-Dhabi, 16-20 December 2024. (Presented: *Sharp Sobolev inequalities on noncompact Riemannian manifolds)*.

J) National and International Research Projects (selected list):

1. Program coordinator (Senior category): *Eigenvalues on curved spaces*. 2021-2023, PN-III-P4-ID-PCE-2020-1001, CNCSIS (=National Research Center for Advanced Studies), Bucharest, Romania. Five members involved.
2. Program coordinator (Senior category): *Functional inequalities and elliptic PDEs: the influence of curvature.* 2018- 2022, National Research, Development and Innovation Fund of Hungary, K_18, No. 127926.
3. Program coordinator (Senior category): *Symmetries in elliptic problems: Euclidean vs. non-euclidean techniques*. 2011-2016, PN-II-ID-PCE-2011-3-0241, CNCSIS, Bucharest, Romania. Four members involved.

4. Program coordinator (Senior category): *Application of recent variational methods to the study of nonlinear elliptic PDEs and optimization problems*, 2007-2010, CNCSIS, Bucharest, Romania. Five members involved.
5. Program coordinator (Junior category): *Study of elliptic problems via critical point theory,* CNCSIS, Bucharest, Romania. Three members involved.
6. Member (Young researcher): *Geometrical Analysis*, EU Research Training Network PRN-CT-999-00118/2000-2004, Institute of Mathematics of the Polish Academy of Sciences, Stefan Banach Center, Warsaw, Poland, 4 months (1 June – 31 August 2003, and 20 January – 20 February 2004).

K) PhD students (with defended theses):

- Szilárd Nagy, Babeș-Bolyai University, Cluj-Napoca, Romania. Title of the thesis: Variational Approach to Stackelberg Equilibria (Defended on 11 September 2015).
- Csaba Farkas, Óbuda University, Budapest, Hungary. Title of the thesis: Sobolev-type inequalities on Riemannian manifolds with applications (Defended on 17 April 2018).
- Orsolya Vas, Babeș-Bolyai University, Cluj-Napoca, Romania. Title of the thesis: Variational and topological methods in the study of elliptic inclusions and equations (Defended on 30 September 2021, taken from Cs. Varga after his death, August 2021)
- Ágnes Mester, Doctoral School of Applied Informatics and Applied Mathematics, Óbuda University, Budapest, Hungary. Title of the thesis: Functional Inequalities on Riemann-Finsler Manifold (Defended on 7 March 2023)
- Sándor Kajántó, Babeș-Bolyai University, Cluj-Napoca, Romania. Title of the thesis: New approach for Hardy-Rellich inequalities (Defended on 25 June 2024).

Journal articles:

1. **Kristály A,** Mondino A, *Principal frequency of clamped plates on RCD(0,N) spaces: sharpness, rigidity and stability*, PROC. LOND. MATH. SOC., (3) 131 (2025), no. 2, Paper No. e70079 [**pdf**]
2. Balogh Z, Don S, **Kristály A**, *Weighted Gagliardo-Nirenberg inequalities via Optimal Transport Theory and Applications*, SIAM J. MATH. ANAL., Vol. 57, (2025) Iss. 3, 2175-2209 **[pdf]**
3. Farkas C, Kajántó S, **Kristály A**, *Sharp spectral gap estimates for higher-order operators on Cartan-Hadamard manifolds,* COMMUN CONTEMP MATH, 27 (2025), no. 3, Paper No. 2450013 **[pdf]**
4. **Kristály A**, *Sharp Sobolev inequalities on noncompact Riemannian manifolds with* $Ric \geqslant 0$ *via Optimal Transport theory*, CALCULUS OF VARIATIONS AND PDE, (2024) 63:200 **[pdf]** [1]

[1] In this paper I solved the open problem formulated in Adv. Math. [2004] by the Fields medalist Cedric Villani on Riemannian manifolds with nonnegative Ricci curvature.

5. Balogh Z, Don S, **Kristály A**, *Sharp weighted log-Sobolev inequalities: characterization of equality cases and applications*, TRANS. AMER. MATH. SOC., 377 (2024) no. 7, 5129–5163 **[pdf]**
6. Kajántó S, **Kristály A**, Peter I R, Zhao W, *A generic functional inequality and Riccati pairs: an alternative approach to Hardy-type inequalities*, MATH ANNALEN, 390 (2024), 3621–3663 **[pdf]**
7. Balogh Z, **Kristály A,** Tripaldi F, *Sharp log-Sobolev inequalities in CD(0,N) spaces with applications*, J. FUNCT. ANAL. paper no. 110217, 286 (2024) no. 2, 41 p.**[pdf]**
8. Kajántó S, **Kristály A**, *Saturation phenomena of a nonlocal eigenvalue problem: the Riemannian case*, OPTIMIZATION, 73 (2024) no. 11, 3299–3322 **[pdf]**
9. **Kristály A**, Mester Á, Mezei I. I, *Sharp Morrey-Sobolev inequalities and eigenvalue problems on Riemannian- Finsler manifolds with nonnegative Ricci curvature*, COMMUN CONTEMP MATH, 25 (2023), no. 10, Paper No. 2250063 **[pdf]**
10. **Kristály A**, Mezei I. I, Szilák K, *Elliptic differential inclusions on non-compact Riemannian manifolds*, NONLINEAR ANALYSIS-REAL WORLD APPLICATIONS, 69 (2023), 103740 **[pdf]**
11. Balogh Z, **Kristály A**, *Sharp isoperimetric and Sobolev inequalities in spaces with nonnegative Ricci curvature*, MATH ANNALEN, 385 (2023), no. 3-4, 1747–1773. **[pdf]**
12. **Kristály A**, *Lord Rayleigh's Conjecture for Vibrating Clamped Plates in Positively Curved Spaces*, GEOM FUNCT ANAL (GAFA), 32 (2022) 881–937 **[pdf]**[2]
13. **Kristály A,** *New features of the first eigenvalue on negatively curved spaces,* ADV. CALC. VAR., 15 (2022), no. 3, 475–495. **[pdf]**
14. **Kristály A**, Zhao W, *On the geometry of irreversible metric-measure spaces: Convergence, Stability and Analytic aspects*, J MATH PURES APPL (Liouville Journal), 158 (2022), 216-292 **[pdf]**
15. **Kristály A**, Shen Z, Yuan L, Zhao W, *Nonlinear spectrums of Finsler manifolds*, MATH. Z., 300 (2022), 81-123 **[pdf]**
16. Farkas C, **Kristály A**, Mester Á, *Compact Sobolev embeddings on non-compact manifolds via orbit expansions of isometry groups*, CALCULUS OF VARIATIONS AND PDE, (2021) 60:128 **[pdf]**
17. Kajántó S, **Kristály A**, *Unexpected Behaviour of Flag and S-Curvatures on the Interpolated Poincaré Metric*, J. GEOM. ANAL., 31 (2021), 10246–10262 **[pdf]**
18. Balogh Z, Gutiérrez E C, **Kristály A,** *Sobolev inequalities with jointly concave weights on convex cones,* PROC. LOND. MATH. SOC., 122 (2021), no. 4, 537-568. **[pdf]**
19. Huang L, **Kristály A**, Zhao W, *Sharp uncertainty principles on general Finsler manifolds,* TRANS. AMER. MATH. SOC., 373 (2020), no. 11, 8127–8161. **[pdf]**

[2] In this paper I provided the first affirmative answer concerning the validity of the longstanding conjecture of Lord Rayleigh for clamped plates on high-dimensional positively curved spaces.

20. **Kristály A,** *Fundamental tones of clamped plates in nonpositively curved spaces*, ADV. MATH., 367 (2020), 107113, p. 39. **[pdf]**[3]

21. **Kristály A**, *Nodal solutions for the fractional Yamabe problem on Heisenberg groups*, PROC. ROY. SOC. EDINBURGH SECT. A, 150 (2020), no. 2, 771–788. **[pdf]**

22. **Kristály A**, Mezei I. I, Szilák K, *Differential inclusions involving oscillatory terms*, NONLINEAR ANALYSIS, 197 (2020), 111834, p. 21. **[pdf]**

23. Balogh Z**, Kristály A**, Sipos K, *Jacobian determinant inequality on corank 1 Carnot groups with applications*, J. FUNCT. ANAL., 277 (2019), no. 12, 108293, p. 36. **[pdf]**

24. **Kristály A**, *New geometric aspects of Moser-Trudinger inequalities on Riemannian manifolds: the non-compact case*, J. FUNCT. ANAL., 276 (2019), no. 8, 2359-2396. **[pdf]**

25. **Kristály A**, Szakál A, *Interpolation between Brezis-Vázquez and Poincaré inequalities on nonnegatively curved spaces: sharpness and rigidities*, J. DIFFERENTIAL EQUATIONS, 266 (2019), no. 10, 6621-6646. **[pdf]**

26. Balogh Z**, Kristály A**, *Equality in Borell-Brascamp-Lieb inequalities on curved spaces*, ADV. MATH., 339 (2018), 453-494. **[pdf]**

27. Balogh Z**, Kristály A**, Sipos K, *Geometric inequalities on Heisenberg groups*, CALCULUS OF VARIATIONS AND PDE, (2018) 57:61, 1-41. **[pdf]**

28. **Kristály A**, *Poincaré's lemma on some non-Euclidean structures*, CHINESE ANNALS OF MATHEMATICS, SERIES B (Special issue in honor of P. G. Ciarlet), 39 (2018), no. 2, 297–314. **[pdf]**

29. Barbosa E, **Kristály A**, *Second-order Sobolev inequalities on Riemannian manifolds with nonnegative Ricci curvature*, BULL. LONDON MATH. SOC., 50 (2018), no. 1, 35-45. **[pdf]**

30. Faraci F, Farkas C, **Kristály A**, *Multipolar Hardy inequalities on Riemannian manifolds*, ESAIM: CONTROL OPTIM. AND CALC. OF VARIATIONS, 24 (2018), no. 2, 551–567. **[pdf]**

31. **Kristály A,** *Sharp uncertainty principles on Riemannian manifolds: the influence of curvature*, J MATH PURES APPL (Liouville Journal), 119 (2018), 326–346 **[pdf]**

32. **Kristály A,** *Metric measure spaces supporting Gagliardo-Nirenberg inequalities: volume non-collapsing and rigidities*, CALCULUS OF VARIATIONS AND PDE 55 (2016), no. 5, Art. 112, 27 pp. **[pdf]**

33. Farkas C, **Kristály A**, *Schrödinger-Maxwell systems on non-compact Riemannian manifolds*, NONLINEAR ANALYSIS-REAL WORLD APPLICATIONS, 31 (2016), 473-491. **[pdf]**

[3] In this paper I solved the longstanding conjecture of Lord Rayleigh for clamped plates on low-dimensional negatively curved spaces.

34. **Kristály A**, Repovš D, *Quantitative Rellich inequalities on Finsler-Hadamard manifolds*, COMMUN. CONTEMP. MATH.,18 (2016), no. 6, 1650020, 17 pp. **[pdf]**

35. Balogh Z**, Kristály A**, Sipos K, *Geodesic interpolation inequalities on Heisenberg groups*, C. R. MATH. ACAD. SCI. PARIS 354 (2016), no. 9, 916–919. **[pdf]**

36. **Kristály A**, Li C, López-Acedo G, Nicolae A, *What do`convexities' imply on Hadamard manifolds?*, J. OPTIM. THEORY APPL. 170 (2016), no. 3, 1068–1074. **[pdf]**

37. **Kristály A**, *A Sharp Sobolev Interpolation Inequality on Finsler Manifolds*, J. GEOM. ANAL. 25 (2015), no. 4, 2226–2240. **[pdf]**

38. Farkas C, **Kristály A**, Varga C, *Singular Poisson equations on Finsler–Hadamard manifolds*, CALCULUS OF VARIATIONS AND PDE 54 (2015), no. 2, 1219–1241. **[pdf]**

39. Balogh Z, Calogero A, **Kristály A**, *Sharp comparison and maximum principles via horizontal normal mapping in the Heisenberg group*, J. FUNCT. ANAL. 269 (2015), no. 9, 2669–2708. **[pdf]**

40. **Kristály A**, Rudas I J, *Elliptic problems on the ball endowed with Funk-type metrics*, NONLINEAR ANAL. 119 (2015), 199–208. **[pdf]**

41. **Kristály A**, *Sharp Morrey-Sobolev inequalities on complete Riemannian manifolds*, POTENTIAL ANAL. 42 (2015), no. 1, 141–154. **[pdf]**

42. **Kristály A**, *Nash-type equilibria on Riemannian manifolds: a variational approach*, J MATH PURES APPL (Liouville Journal), *(9)* 101 (2014), no. 5, 660–688 **[pdf]**

43. **Kristály A**, Ohta S, *Caffarelli-Kohn-Nirenberg inequality on metric measure spaces with applications*, MATH ANNALEN, 357:(2) 711-726 (2013). **[pdf]**

44. Balogh Z, **Kristály A**, *Lions-type compactness and Rubik actions on the Heisenberg group*, CALCULUS OF VARIATIONS AND PDE, 48:(1-2) 89-109 (2013). **[pdf]**

45. **Kristály A**, Repovš D, Metric projections versus non-positive curvature, DIFF GEOM APPL 31(5) 602-610 (2013). **[pdf]**

46. **Kristály A**, Repovs D, *On the Schrödinger–Maxwell system involving sublinear terms*, NONLINEAR ANALYSIS-REAL WORLD APPLICATIONS, 13:(1), 213-223 (2012). **[pdf]**

47. **Kristály A**, *Bifurcations effects in sublinear elliptic problems on compact Riemannian manifolds*, J MATH ANAL APPL 385:(1) 179–184 (2012). **[pdf]**

48. Faraci F, **Kristály A**, *Three non-zero solutions for a nonlinear eigenvalue problem*, J MATH ANAL APPL 394 (2012), no. 1, 225–230. **[pdf]**

49. Faraci F, Iannizzotto A, **Kristály A**, *Low-dimensional compact embeddings of symmetric Sobolev spaces with applications*, P ROY SOC EDINB – SECTION A 141:(2) 383–395 (2011). **[pdf]**

50. **Kristály A**, Repovs D, *Multiple solutions for a Neumann system involving subquadratic nonlinearities*, NONLINEAR ANALYSIS-TMA, 74:(6) 2127–2132 (2011). **[pdf]**

51. **Kristály A**, Mihăilescu M, Rădulescu R, Tersian S, *Spectral estimates for a nonhomogeneous difference problem*, COMMUN CONTEMP MATH 12:(6) 1015–1029 (2010). **[pdf]**

52. **Kristály A**, *Location of Nash equilibria: a Riemannian geometrical approach*, PROC AMER MATH SOC 138:(5) 1803-1810 (2010). **[pdf]**

53. **Kristály A**, *On a new class of elliptic systems with nonlinearities of arbitrary growth*, J DIFFERENTIAL EQUATIONS, 249:(8) 1917–1928 (2010). **[pdf]**

54. **Kristály A**, Morosanu Gh, *New competition phenomena in Dirichlet problems*, J MATH PURES APPL (Liouville Journal), 94:(6) 555-570 (2010). **[pdf]**

55. **Kristály A**, Marzantowicz W, Varga Cs, *A non-smooth three critical points theorem with applications in differential inclusions*, J GLOBAL OPTIM 46:(1) 49-62 (2010). **[pdf]**

56. **Kristály A**, Papageorgiou NS, *Multiple nontrivial solutions for Neumann problems involving the p-Laplacian: a Morse theoretical approach*, ADV NONLINEAR STUD 10:(1), 83-107 (2010). **[pdf]**

57. **Kristály A**, Papageorgiou NS, Varga Cs, *Multiple solutions for a class of Neumann elliptic problems on compact Riemannian manifolds with boundary*, CANAD MATH BULL 53:(4) 674–683 (2010).

58. **Kristály A**, *Asymptotically critical problems on higher-dimensional spheres*, DISCRETE CONT DYN SYSTEMS 23: (3) 919-935 (2009). **[pdf]**

59. **Kristály A**, Varga C, *Multiple solutions for a degenerate elliptic equation involving sublinear terms at infinity*, J MATH ANAL APPL 352: (1) 139-148 (2009). **[pdf]**

60. **Kristály A**, Papageorgiou NS, *Multiplicity theorems for semilinear elliptic problems depending on a parameter*, P EDINBURGH MATH SOC 52: (1) 171-180 (2009). **[pdf]**

61. **Kristály A**, Radulescu V, *Sublinear eigenvalue problems on compact Riemannian manifolds with applications in Emden-Fowler equations*, STUD MATH 191: (3) 237-246 (2009). **[pdf]**

62. **Kristály A**, Mihailescu M, Radulescu V, *Two nontrivial solutions for a non-homogeneous Neumann problem: an Orlitz-Sobolev space setting*, P ROY SOC EDINB – SECTION A 139: 367-379 (2009). **[pdf]**

63. Filippakis M, **Kristály A**, Papageorgiou NS, *Existence of five nonzero solutions with exact sign for a p-Laplacian equation*, DISCRETE CONT DYN SYSTEMS 24: (2) 405-440 (2009). **[pdf]**

64. **Kristály A**, *Detection of arbitrarily many solutions for perturbed elliptic problems involving oscillatory terms*, J DIFFERENTIAL EQUATIONS 245: (12) 3849-3868 (2008). **[pdf]**

65. **Kristály A**, Lisei H, Varga C, *Multiple solutions for p-Laplacian type equations*, NONLINEAR ANALYSIS-TMA 68: (5) 1375-1381 (2008). **[pdf]**

66. **Kristály A**, Marzantowicz W, *Multiplicity of symmetrically distinct sequences of solutions for a quasilinear problem in RN*, NODEA- NONLINEAR DIFF EQUATIONS APPL 15: (1-2) 209-216 (2008). **[pdf]**

67. **Kristály A**, Morosanu G, Roth A, *Optimal placement of a deposit between markets:Riemann-Finsler geometrical approach*, J OPTIM THEORY APPL 139: (2) 263-276 (2008). **[pdf]**

68. **Kristály A**, *Perturbed Neumann problems with many solutions*, NUMER FUNC ANAL OPT 29: (8/9) 1114-1127 (2008). **[pdf]**

69. **Kristály A**, *A double eigenvalue problem for Schrodinger equations involving sublinear nonlinearities at infinity*, ELECTR J DIFFER EQUAT 42: (42) 1-11 (2007).

70. **Kristály A**, Varga C, Varga V, *A nonsmooth principle of symmetric criticality and variational-hemivariational inequalities*, J MATH ANAL APPL 325: (2) 975-986 (2007). **[pdf]**

71. **Kristály A**, Varga C, *Multiple solutions for elliptic problems with singular and sublinear potentials*, P AMER MATH SOC 135: (7) 2121-2126 (2007). **[pdf]**

72. **Kristály A**, *Multiple solutions of a sublinear Schrodinger equation*, NODEA-NONLINEAR DIFF EQUATIONS APPL 14: (3-4) 291-302 (2007). **[pdf]**

73. **Kristály A**, Motreanu D, *Nonsmooth Neumann-type problems involving the p-Laplacian*, NUMER FUNC ANAL OPT 28: (11-12) 1309-1326 (2007). **[pdf]**

74. **Kristály A**, Faraci F, *On an open question of Ricceri concerning a Neumann problem*, GLASGOW MATH J 49: (2) 189-195 (2007). **[pdf]**

75. **Kristály A**, Faraci F, *One-dimensional scalar field equations involving an oscillatory nonlinear term*, DISCRETE CONT DYN SYSTEMS 18: (1) 107-120 (2007). **[pdf]**

76. **Kristály A**, Morosanu G, Tersian S, *Quasilinear elliptic problems in involving oscillatory nonlinearities*, J DIFFERENTIAL EQUATIONS 235: (2) 366-375 (2007). **[pdf]**

77. Kozma L, **Kristály A**, *Metric characterization of Berwald spaces of non-positive flag curvature*, J GEOMETRY PHYSICS 56: 1257-1270 (2006). **[pdf]**

78. **Kristály A**, *Existence of nonzero weak solutions for a class of elliptic variational inclusions systems in RN*, NONLINEAR ANALYSIS-TMA 65: (8) 1578-1594 (2006). **[pdf]**

79. **Kristály A**, *Infinitely many solutions for a differential inclusion problem in R^N*, J DIFFERENTIAL EQUATIONS 220: (2) 511-530 (2006). **[pdf]**

80. **Kristály A**, Motreanu V, Varga C, *A minimax principle with general Palais-Smale conditions*, COMMUN APPL ANAL 9: (2) 285-299 (2005). **[pdf]**

81. **Kristály A**, Varga C, Varga V, *An eigenvalue problem for hemivariational inequalities with combined nonlinearities on an infinite strip*, NONLINEAR ANALYSIS-TMA 63: (2) 260-277 (2005). **[pdf]**
82. **Kristály A**, *Existence of two nontrivial solutions for a class of quasilinear elliptic variational systems on strip-like domain*, P EDINBURGH MATH SOC 48: (2) 465-477 (2005). **[pdf]**
83. **Kristály A**, *Infinitely many radial and non-radial solutions for a class of hemivariational inequalities*, ROCKY MT J MATH 35: (4) 1173-1190 (2005). **[pdf]**
84. **Kristály A**, *Multiplicity results for an eigenvalue problem for hemi-variational inequalities in strip-like domains*, SET-VALUED ANAL 13: (1) 85-103 (2005). **[pdf]**
85. **Kristály A**, Varga C, *On a class of a quasilinear elliptic problem in R^N*, MATH NACHR 275: (15) 1756-1765 (2005). **[pdf]**
86. Kozma L, **Kristály A**, Varga C, *Dispersing of geodesics in Berwald spaces of nonpositive flag*, HOUSTON J MATH 30: (2) 403-420 (2004). **[pdf]**
87. **Kristály A**, Varga C, *Set-valued versions of Ky Fan's inequality with application to variational inclusion theory*, J MATH ANAL APPL 282: (1) 8-20 (2003). **[pdf]**

Monographs:

1. Costea N, **Kristály A**, Varga C, *Variational and Monotonicity Methods in Nonsmooth Analysis*, Frontiers in Mathematics, Birkhäuser/Springer, 2021. ISBN 978-3-030-81670-4.
2. **Kristály A**, Rădulescu V, Varga C, *Variational Principles in Mathematical Physics, Geometry, and Economics*, Encyclopedia of Mathematics and its Applications, No. 136, Cambridge University Press, Cambridge, UK, 2010. ISBN-10: 0521117828 | ISBN-13: 9780521117821
3. **Kristály A**, *A Set-Valued Approach to Critical and Equilibrium Points*, Casa Cartii de Stiinta, Cluj-Napoca, Romania, 2004. ISBN: 978-973-133-616-9.
4. **Kristály A**, Varga C, *An Introduction to Critical Point Theory for Non-smooth Functions*, Casa Cartii de Stiinta, Cluj-Napoca, Romania, 2004. ISBN: 973-686-604-1.

Cluj-Napoca, 27 August 2025 Alexandru Kristály