Tamás László

Curriculum Vitae

Personal Data

Name: Tamás

Surname: László

Date and place of birth: April 10, 1984, Odorheiu-Secuiesc, Romania

Marital status: Married, Father of three children

Citizenship: romanian, hungarian

Email address: tamas.laszlo@ubbcluj.ro

Education

2008–2013 **PhD in Mathematics**, *Central European University, Department of Mathematics and its Applications and Rényi Institute of Mathematics*, Budapest, Hungary.
Title of the thesis: *Lattice cohomology and Seiberg–Witten invariants of normal surface singularities* (degree admission date: 20 December, 2013)
Adviser: Prof. András Némethi, Rényi Institute of Mathematics, Budapest, Hungary

2006–2007 **MSc - Symplectic Geometry and beyond**, *University of Utrecht, Department of Mathematics*, Utrecht, The Netherlands.

2002–2006 **BSc in Mathematics**, *Babeş-Bolyai University, Faculty of Mathematics and Computer Science*, Cluj Napoca, Romania.

Employments

10/2022– **Associate Professor**, Babeş–Bolyai University, Cluj-Napoca, Romania.

01/2023–06/2023 **Senior research fellow**, Erdős Center, Alfréd Rényi Institute of Mathematics, Budapest, Hungary.

02/2020–09/2022 **Assistant Professor**, Babeş–Bolyai University, Cluj-Napoca, Romania.

10/2018–02/2020 **Senior research fellow**, Alfréd Rényi Institute of Mathematics, Budapest, Hungary.

10/2016–09/2018 **Postdoctoral Researcher**, BCAM - Basque Center for Applied Mathematics, Bilbao, Bizkaia, Spain.

2013–09/2016 **Postdoctoral Young Researcher, Hung. Acad. Sci. fellow**, Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, Budapest, Hungary.

2015–2016 **Teaching Associate**, Budapest Business School, Budapest, Hungary.

2014–2016 **Teaching Associate**, Budapest University of Technology and Economics, Department of Analysis, Budapest, Hungary.

2011–2013 **Young Researcher, Hung. Acad. Sci. fellow**, Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, Budapest, Hungary.

2008–2009 **Teaching Associate**, Budapest University of Technology and Economics, Department of Geometry, Budapest, Hungary.

2007–2008 **Early stage researcher**, Budapest University of Technology and Economics, Department of Geometry, Budapest, Hungary.

Scholarships and Grants

2023–2026 "János Bolyai" Research Scholarship of the Hungarian Academy of Sciences

2024 Scholarship for the scientific advisors, Ministry of Foreign Affairs, "Balassi Bálint" Scholarship Program, Hungary

2022 Scientific Research Award, Babeș–Bolyai University, Cluj-Napoca, Romania

2012 Award for Advanced Doctoral Student, Central European University, Budapest, Hungary

2009 Academic Pro-Rector's Excellence Award, Central European University, Budapest, Hungary

2008–2011 PhD Scholarship, Central European University, Budapest, Hungary

2006–2007 Mathematical Research Institute (MRI) Master Class Scholarship, Utrecht, The Netherlands

2005–2006 Socrates-Erasmus scholarship, Department of Geometry, University of Szeged, Hungary (5 months)

2004–2005 Ceepus scholarship, Eötvös Lóránd University, Budapest, Hungary (4 months)

2002–2006 Emeritus scholarship, Babeș–Bolyai University, Cluj Napoca, Romania

Languages

Hungarian **Mothertongue**

Romanian **Advanced**

English **Advanced**

Spanish **Intermediate**

Research interests

- Geometry and topology of complex curve and normal surface singularities: Artin-Laufer program, lattice cohomology and its interactions with Heegaard-Floer and Seiberg-Witten theories, Poincaré series of curves and surfaces and its applications

- Numerical semigroups via singularity theory

- Algebraic and topological aspects of deformations of singularities

- Interactions between algebraic geometry, topology, combinatorics and other fields of mathematics

Publications and Preprints

20. Zs. Baja, T. László, A. Némethi, *Delta invariant of Q-Cartier curve germs and the genus of representable semigroups*, preprint, arXiv:2511.03406 [math.AG] (2025)
19. T. László, *András Némethi - Normal Surface Singularities*, book review (in hungarian), **Magyar Tudomány**, 186/4 (2025), 807–809.
18. L. Koltai, T. László, A. Némethi, *Multiplier ideals of normal surface singularities*, to appear in **Trans.of AMS** (2025)
17. J.I. Cogolludo-Agustín, T. László, J. Martín-Morales, A. Némethi, *Ordinary r-tuples in cyclic quotient surface singularities*, to appear in **AMS Contemporary Math.** (2025), *Proceedings of the Conference on Algebraic and Topological Interplay of Algebraic Varieties*
16. Zs. Baja, T. László, *Flat semigroups and weighted homogeneous surface singularities*, preprint, to appear in **Algebraic and Geom. Topology** (2025)
15. J.I. Cogolludo-Agustín, T. László, J. Martín-Morales, A. Némethi, *Duality for Poincaré series of surfaces and delta invariant of curves*, **Research in Math. Sci.** (2024) vol.11 nr. 47, DOI: https://doi.org/10.1007/s40687-024-00457-8
14. T. László, *On a canonical polynomial for links of elliptic singularities*, preprint, arXiv:2201.10837 [math.GT] (2022), under publication
13. T. László, J. Nagy, *Brill-Noether problem on splice quotient singularities and duality of topological Poincaré series*, preprint, arXiv:2107.02206 [math.AG] (2021)
12. J.I. Cogolludo-Agustín, T. László, J. Martín-Morales, A. Némethi, *Local invariants of minimal generic curves on rational surfaces*, **AMS Contemp. Math.** Vol. 778 (2022), DOI: https://doi.org/10.1090/conm/778/15660
11. J.I. Cogolludo-Agustín, T. László, J. Martín-Morales, A. Némethi, *The delta invariant of curves on rational surfaces II: Poincaré series and topological aspects*, arXiv:2003.07110 [math.GT] (2020)
10. J.I. Cogolludo-Agustín, T. László, J. Martín-Morales, A. Némethi, *Delta invariant of curves on rational surfaces I. The analytic approach*, **Comm. in Contemporary Mathematics** (2021), DOI: https://doi.org/10.1142/S0219199721500528
9. T. László, A. Némethi, *On the geometry of strongly flat semigroups and their generalizations*, in *Proceedings of the conference "A Panorama of Singular Varieties (celebration of Prof. Lê Dũng Tráng's 70th birthday)"* **AMS Contemp. Math.** (2020), DOI: https://doi.org/10.1090/conm/742/14941
8. T. László, J. Nagy, A. Némethi, *Combinatorial duality for Poincaré series, polytopes and invariants of plumbed 3-manifolds*, **Selecta Math. New Ser.** (2019) 25: 21, DOI: https://doi.org/10.1007/s00029-019-0468-9

7. T. László, J. Nagy, A. Némethi, *Surgery formulae for the Seiberg-Witten invariant of plumbed 3-manifolds*, **Rev. Mat. Complut.** (2019), DOI: 10.1007/s13163-019-00297-z
6. T. László, Zs. Szilágyi, *On Poincaré series associated with links of normal surface singularities*, **Trans.of AMS** (2019), DOI: https://doi.org/10.1090/tran/7802
5. T. László, Zs. Szilágyi, *Némethi's division algorithm for zeta-functions of plumbed 3-manifolds*, **Bull. London Math. Soc.** 50 (2018), 1035–1055
4. T. László, Zs. Szilágyi, *Non-normal affine monoids, modules and Poincaré series of plumbed 3-manifolds*, **Acta Math. Hungar.**, 152 (2) (2017), 421–452, DOI: 10.1007/s10474-017-0726-2
3. T. László, A. Némethi, *Reduction theorem for lattice cohomology*, **Int Math Res Notices**, 11 (2015) 2938–2985, https://doi.org/10.1093/imrn/rnu015
2. T. László, A. Némethi, *Ehrhart theory of polytopes and Seiberg-Witten invariants of plumbed 3-manifolds*, **Geometry & Topology**, 18 (2014) 717–778, DOI: 10.2140/gt.2014.18.717
1. T. László, *Lattice cohomology and Seiberg–Witten invariants of normal surface singularities*, PhD thesis, www.etd.ceu.hu/2014/laszlo_tamas.pdf, 2013

Monographs and Lecture Notes

1. T. László, *Poincaré series and polynomials for links of normal surface singularities*, **Cluj University Press** (2022), ISBN: 978-606-37-1465-8
2. T. László, A. Marcus, Cs. Szántó, *Linear Algebra* (in hungarian), **Cluj University Press** (2022), ISBN: 978-606-37-1354-5

Edited Volumes

1. J. Fernández de Bobadilla, T. László, A. Stipsicz (editors), *Singularities and Their Interaction with Geometry and Low Dimensional Topology, In Honor of András Némethi*, **Birkhäuser Trends in Math.**, ISBN: 978-3-030-61957-2

Manuscript in preparation

1. Zs. Baja, T. László, A. Némethi, *Cyclic quotient singularities and proportionally modular numerical semigroups*, manuscript in preparation (2025)
2. T. László, A. Némethi, Gy. Tőtős, *A splicing formula for the polynomial part of Poincaré series for integral homology sphere links*, manuscript in preparation (2025)
3. J.I. Cogolludo-Agustín, T. László, J. Martín-Morales, A. Némethi, *On the semigroup of curves in rational surface singularities*, manuscript in preparation (2026)
4. T. László, J. Martín-Morales, *Lattice homology of Q-resolutions*, manuscript in preparation (2026)
5. A.A. Kubasch, T. László, A. Némethi, G. Schefler, *Embedded lattice homology of curves*, ongoing project and manuscript in preparation (2026)

Research projects

2022–2027 *Member* - NKFIH Grant "Élvonal (Frontier)" KKP 144148 - National Sci- ence Fundation of Hungary (PI: A. Némethi)

2018–2020 *Member* - NKFIH Grant "Élvonal (Frontier)" KKP 126683 - National Science Fundation of Hungary (PI: A. Stipsicz)

2018–2020 *Member* - NKFIH Grant "Élvonal (Frontier)" KKP 126683 - National Science Fundation of Hungary (PI: A. Stipsicz)

2016–2018 *Member* - ERC CoG "New methods and interacions in Singularity Theory and beyond" - FP7-IDEAS-ERC (PI: J. Fernández de Bobadilla)

2012–2015 *Member* - Research grant "Surface singularities and contact topology" OTKA no.100796 - National Science Fundation of Hungary (PI: A. Némethi)

Talks

2025 *'Invariants of numerical semigroups and surface singularities'*, 'Singularities in Plovdiv' international conference, Plovdiv, Bulgaria, June 8 - 13, 2025

2024 *'Lattice cohomology: then and now'* lecture series, 'IberoSing International Workshop 2024' conference at Univ. Politécnica de Madrid, Spain, November 25 - 29, 2024

'Numerical semigroups and surface singularities', 'Theoretical and computational algebra' conference at University of Aveiro, Aveiro, Portugal, June 30 - July 5, 2024

'Seifert 3-manifolds and numerical semigroups', Topology seminar - Simion Stoilow Institute of Math. (IMAR), Bucharest, Romania, June 27, 2024

2023 *'Numerical semigroups and weighted homogeneous surface singularities'*, 10th Congress of the Romanian Mathematicians, Pitești, Romania, 30 June - 5 July

'The Frobenius problem and weighted homogeneous surface singularities', 'Singularity Conference' at Erdős Center, Budapest, Hungary, 6 -10 March

2021 *'On the delta invariant of curves on rational surface singularities'*, Conference on 'Faces of Singularity Theory', Lumini, Marseille, France, November 22 - 26, 2021

'Delta invariant of curves and beyond', Knot theory seminar, University of Warsaw, Poland, May 21

2020 *'On delta invariant of curves on rational surface singularities'*, 16th International Workshop on Real and Complex Singularities (online edition), November 23 - 30

2019 *'Delta invariant formulae of curves on rational surface singularities I., II.'*, Alg. Geom.& Diff. Top. Seminar, Rényi Inst. of Math., Budapest

'On delta invariants of curves on rational surface singularities', Workshop on Singularities: topology, valuations and semigroups, Madrid, May 29-31, 2019

2018 *'Strongly flat semigroups and their geometry'*, Alg. Geom.& Diff. Top. Seminar, MTA Rényi Inst. of Math., Budapest

2017 *'On (topological) Poincaré series'*, Workshop on Theory of valuations, Paris, December 4-6, 2017

2017 *'Némethi's division algorithm for zeta-functions of links of normal surface singularities'*, 4^o Congreso de Jóvenes Investigadores, Real Sociedad Matemática Española, Valencia, September 4-8, 2017

'On zeta-functions of links of normal surface singularities', Geometric aspects of singularities, Lille, May 29-31, 2017

2016 Doctoral course '*Topological studies with a view towards Artin-Laufer program of normal surface singularities*' given at the Universidad Complutense de Madrid, Department of Algebra, Madrid

'Non-normal affine monoids and surface singularities', Algebraic Geometry and Differential Topology Seminar, MTA Rényi Inst. of Math., Budapest

2014 *'Topological Poincaré series of normal surface singularities and Ehrhart theory of polytopes'* at the '13^{th} International Workshop on Real and Complex Singularities', USP, Sao Carlos, Brasil

2013 *'Poincaré series, Ehrhart theory and Seiberg–Witten invariants associated with negative definite plumbed 3-manifolds'* at the conference on 'Geometry and topology of smooth 4–manifolds', Max Planck Institute for Mathematics, Bonn, Germany

2012–2015 Several talks on the 'Singularity Theory and Low Dimensional Topology Seminar' at the MTA Rényi Inst. of Math., Budapest

Organizational activities

2025 Organization of the *'Moduli, Hilbert Schemes and Singularities'* conference, Cluj-Napoca, September 8 - 12

2023 Organization of the *'1st Budapest-Cluj Meeting in Singularities and Beyond'* workshop, Cluj-Napoca, October 31 - November 2

2019 Organization of the international conference *'Némethi60: Geometry and Topology of Singularities'*, Budapest, May 27-31, 2019

Editorial and Reviewing activities

2021– Member of the Editorial Board of the Acta Universitatis Sapientiae, Mathematica journal

Advisor of BSc and MSc students

2025 E.Veress - BSc in Math., Babeș–Bolyai Univ., Cluj

2024 B. Sógor - BSc in Math., Babeș–Bolyai Univ., Cluj

A. Nagy - Advanced Mathematics MSc, Babeș–Bolyai Univ., Cluj

2023 A.M. Gáspár, N. Fábián, A.T. Kiss - BSc in Math. and Math& Comp. Science, Babeș–Bolyai Univ., Cluj

2022 A. Nagy - BSc in Math., Babeș–Bolyai Univ., Cluj

Zs. Baja - Advanced Mathematics MSc, Babeș–Bolyai Univ., Cluj

Co-advisor of PhD students

2022– Zsolt Baja, György Tőtős - Doctoral School of the Faculty of Math. and Comp.Sci, Babeș–Bolyai Univ., Cluj

November 11, 2025 Tamás László
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