

## Papadima Volume

**Alexandru Dimca · Laurențiu Păunescu ·  
Alexander I. Suci**

August 27, 2020

Ștefan Papadima was born in Bucharest, Romania on 7 March 1953, in a family of literary-oriented intellectuals. His father, Ovidiu, was a distinguished literary critic, while his mother, Ștefania, was a high school Latin teacher. Ștefan, on the other hand, decided to become a mathematician. He studied at the Faculty of Mathematics and Mechanics of the University of Bucharest from 1971 to 1976, after which he taught in a high school for several years before being allowed to enroll as a Ph.D. student. His initial advisor was Dan Burghilea, but after Burghilea left for the United States, Papadima completed in 1982 his thesis, titled *Rational homotopy types of smooth manifolds*, with Kostake Teleman as the official advisor.

From 1980 to 1990 Papadima was a researcher at the National Institute for Scientific and Technical Creation (INCREST), and from then on, senior re-

---

A.I. Suci partially supported by Simons Foundation Collaboration Grants for Mathematicians #354156 and #693825

Alexandru Dimca  
Laboratoire J.-A. Dieudonné, UMR du CNRS 7351  
Université Côte d'Azur  
06100 Nice, France  
E-mail: Alexandru.Dimca@unice.fr

Laurențiu Păunescu  
The University of Sydney  
School of Mathematics and Statistics  
Sydney, NSW 2006, Australia  
E-mail: laurentiu.paunescu@sydney.edu.au

Alexander I. Suci  
Department of Mathematics  
Northeastern University  
Boston, MA 02115, USA  
E-mail: a.suci@northeastern.edu



searcher and Head of the Topology and Geometry Research Workgroup at the “Simion Stoilow” Institute of Mathematics of the Romanian Academy (IMAR), which he helped to reorganize after the 1989 Revolution. The Topology Seminar, which he started in 1978 and ran on Fridays, attracted over a period of 40 years a dedicated group of researchers, postdocs, and students. He loved traveling, and made extended stays at universities and research institutes in the United States, France, Italy, Germany, and Australia. In 1987 he received the Gheorghe Țițeica Prize of the Romanian Academy for contributions in Algebraic Topology, and in 2013 he received the Grigore Moisil Prize of the Romanian Academy.

Papadima had broad mathematical interests, ranging from algebraic and geometric topology to algebraic and differential geometry, and from group theory and discrete geometry to the representation theory of Lie groups and Lie algebras. In the beginning he was working almost exclusively by himself, but once things opened up after 1990, he started more and more working on joint projects, with a total of 16 collaborators. His research focussed mainly on rational homotopy theory, hyperplane arrangements, links and braid groups, fundamental groups of smooth algebraic varieties, and cohomology jump loci, as well as their interconnections with other branches of mathematics.

Besides mathematics, Ștefan had a keen appreciation of literature and movies; when traveling, he never forgot to carry several books with him. He greatly enjoyed the outdoors, both the mountains and the sea, as well as visiting cultural landmarks. He was passionate about world history and held strong, carefully reasoned opinions on a wide range of issues. His many friends and collaborators remember him as a gifted story-teller, with a very special sense of humor.

Ștefan died in Bucharest on 10 January 2018. He is survived by his wife Mihaela, his daughter Raluca, and granddaughter Mia.

In May 2018, a Topology and Geometry Conference dedicated to Ștefan Papadima's memory was held at IMAR in Bucharest. The conference was organized by the editors of this volume, together with Marian Aprodu, Denis Ibadula, Anca Măcinic, Sergiu Moroianu, and Victor Vuletescu. This volume includes contributions from most of the speakers at the conference, and some of their collaborators. It touches upon a wide range of topics of current research, reflecting the extensive range of Papadima's interests and his taste for mathematics.

The volume is dedicated to the memory of Ștefan Papadima.

## Publications of Ștefan Papadima

1. Ș. Papadima, *A formula for the stability of the weighted  $\hat{A}$ -genus and a vanishing theorem for the  $\hat{A}$ -genus*. Stud. Cerc. Mat. **29** (1977), no. 2, 149–157.
2. Ș. Papadima, L. Păunescu, *Teoria rațională a omotopiei* (in Romanian), INCREST Seminar Monographs, no. 1, 1981, 192 pp.
3. Ș. Papadima, *Tipurile de omotopie rațională ale varietăților diferențiale* (in Romanian), Ph.D. Thesis, University of Bucharest, 1982.
4. Ș. Papadima, *On the formality of maps*, An. Univ. Timișoara Ser. Științ. Mat. **20** (1982), no. 1-2, 30–40.
5. Ș. Papadima, *Homotopie rationnelle des espaces de Thom et problèmes de lissage*, C. R. Acad. Sci. Paris Sér. I Math. **297** (1983), no. 3, 189–191.
6. Ș. Papadima, *Poincaré duality algebras and the rational classification of differentiable manifolds*, in: Algebraic homotopy and local algebra (Luminy, 1982), 268–272, Astérisque, vol. 113–114, Soc. Math. France, Paris, 1984.
7. Ș. Papadima, *Classification of Poincaré duality algebras over the rationals*, Geom. Dedicata **17** (1984), no. 2, 199–205.
8. Ș. Papadima, *The cellular structure of formal homotopy types*, J. Pure Appl. Alg. **35** (1985), 171–184.
9. Ș. Papadima, *The rational homotopy of Thom spaces and the smoothing of isolated singularities*, Ann. Inst. Fourier (Grenoble) **35** (1985), no. 3, 119–135.
10. Ș. Papadima, *The rational homotopy of Thom spaces and the smoothing of homology classes*, Comment. Math. Helv. **60** (1985), no. 4, 601–614.
11. Ș. Papadima, *Propriétés de rigidité des groupes de Lie compacts modulo leurs tores maximaux*, C. R. Acad. Sci. Paris Sér. I Math. **302** (1986), no. 12, 455–458.
12. Ș. Papadima, *Rigidity properties of compact Lie groups modulo maximal tori*, Math. Ann. **275** (1986), no. 4, 637–652.
13. Ș. Papadima, *Complex cohomology automorphisms of compact homogeneous spaces of positive Euler characteristic*, in: Proceedings of the Winter School on Geometry and Physics (Srń, 1987), Rend. Circ. Mat. Palermo (2) Suppl. No. **16** (1987), 217–226.
14. Ș. Papadima, *Rational homotopy equivalences of Lie type*, Math. Proc. Cambridge Philos. Soc. **104** (1988), no. 1, 65–80.
15. Ș. Papadima, *Discrete symmetry, toral symmetry and the Euler characteristic of manifolds*, Proc. Amer. Math. Soc. **103** (1988), no. 2, 612–614.
16. M. Markl, Ș. Papadima, *Geometric decompositions, algebraic models and rigidity theorems*, J. Pure Appl. Algebra **71** (1991), no. 1, 53–73.
17. M. Markl, Ș. Papadima, *Homotopy Lie algebras and fundamental groups via deformation theory*, Ann. Inst. Fourier (Grenoble) **42** (1992), no. 4, 905–935.
18. M. Markl, Ș. Papadima, *Moduli spaces for fundamental groups and link invariants derived from the lower central series*, Manuscripta Math. **81** (1993), no. 3-4, 225–242.
19. Ș. Papadima, *Homotopy Lie algebras and submanifolds*, J. Pure Appl. Algebra **91** (1994), no. 1-3, 219–229.

20. B. Berceanu, Ș. Papadima, *Cohomologically generic 2-complexes and 3-dimensional Poincaré complexes*, Math. Ann. **298** (1994), no. 3, 457–480.
21. B. Berceanu, Ș. Papadima, *Moduli spaces for generic low-dimensional complexes*, J. Pure Appl. Algebra **95** (1994), no. 1, 1–25.
22. Ș. Papadima, *Finite determinacy phenomena for finitely presented groups*, Proceedings of the 2nd Gauss Symposium. Conference A: Mathematics and Theoretical Physics (Munich, 1993), Sympos. Gaussiana, de Gruyter, Berlin, 1995, pp. 507–528.
23. S. Papadima, L. Paunescu, *Reduced weighted complete intersection and derivations*, J. Algebra **183** (1996), no. 2, 595–604.
24. S. Papadima, *Campbell–Hausdorff invariants of links*, Proc. London Math. Soc. **75** (1997), no. 3, 641–670.
25. Ș. Papadima, *A rational homotopy analogue of the Poincaré conjecture*, Rev. Roumaine Math. Pures Appl. **42** (1997), no. 1-2, 121–132.
26. M. Jambu, S. Papadima, *A generalization of fiber-type arrangements and a new deformation method*, Topology **37** (1998), no. 6, 1135–1164.
27. S. Papadima, S. Yuzvinsky, *On rational  $K[\pi, 1]$  spaces and Koszul algebras*, J. Pure Appl. Alg. **144** (1999), 157–167.
28. S. Papadima, *Braid commutators and homogeneous Campbell–Hausdorff tests*, Pacific J. Math. **197** (2001), no. 2, 383–416.
29. Ș. Papadima, *On the indeterminacy and the realization of Milnor’s  $\bar{\mu}$ -invariants*, Rev. Roumaine Math. Pures Appl. **46** (2001), no. 4, 471–487.
30. Ș. Papadima, *Generalized  $\bar{\mu}$ -invariants for links and hyperplane arrangements*, Proc. London Math. Soc. (3) **84** (2002), no. 2, 492–512.
31. M. Jambu, Ș. Papadima, *Deformations of hypersolvable arrangements*, Arrangements in Boston: a Conference on Hyperplane Arrangements (1999), Topology Appl. **118** (2002), no. 1-2, 103–111.
32. Ș. Papadima, *The universal finite-type invariant for braids, with integer coefficients*, Arrangements in Boston: a Conference on Hyperplane Arrangements (1999). Topology Appl. **118** (2002), no. 1-2, 169–185.
33. S. Papadima, A. Suciu, *Higher homotopy groups of complements of hyperplane arrangements*, Advances in Math. **165** (2002), no. 1, 71–100.
34. S. Papadima, A. Suciu, *Rational homotopy groups and Koszul algebras*, C. R. Math. Acad. Sci. Paris **335** (2002), 53–58.
35. A. Dimca, S. Papadima, *Hypersurface complements, Milnor fibers and minimality of arrangements*, Annals of Math. **158** (2003), 473–507.
36. S. Papadima, A.I. Suciu, *Chen Lie algebras*, Int. Math. Res. Not. (2004), no. 21, 1057–1086.
37. A. Dimca, S. Papadima, *Equivariant chain complexes, twisted homology and relative minimality of arrangements*, Ann. Sci. École Norm. Sup. **37** (2004), no. 3, 449–467.
38. S. Papadima, A.I. Suciu, *Homotopy Lie algebras, lower central series, and the Koszul property*, Geometry & Topology **8** (2004), 1079–1125.
39. A.D.R. Choudary, A. Dimca, S. Papadima, *Some analogs of Zariski’s Theorem on nodal line arrangements*, Algebr. Geom. Topol. **5** (2005), 691–711.
40. Ș. Papadima, L. Păunescu, *Isometry-invariant geodesics and nonpositive derivations of the cohomology*, J. Differential Geom. **71** (2005), no. 1, 159–176.
41. S. Papadima, A.I. Suciu, *Algebraic invariants for right-angled Artin groups*, Math. Annalen, **334** (2006), no. 3, 533–555.
42. S. Papadima and A.I. Suciu, *When does the associated graded Lie algebra of an arrangement group decompose?*, Comment. Math. Helv. **81** (2006), 859–875.
43. S. Papadima, A.I. Suciu, *Algebraic invariants for Bestvina–Brady groups*, J. London Math. Society, **76** (2007), no. 2, 273–292.
44. Ș. Papadima, L. Păunescu, *Closed manifolds coming from Artinian complete intersections*, Trans. Amer. Math. Soc. **359** (2007), no. 6, 2777–2786.
45. S. Papadima, *Global versus local algebraic fundamental groups*, in: *Mini-Workshop: Topology of closed one-forms and cohomology jumping loci*, Oberwolfach Rep. **4** (2007), no. 3, 2340–2341.
46. S. Papadima, A.I. Suciu, *Toric complexes and Artin kernels* (with S. Papadima), Advances in Mathematics **220** (2009), no. 2, 441–477.

47. A. Dimca, S. Papadima, A.I. Suciu, *Quasi-Kähler Bestvina-Brady groups* Journal of Algebraic Geometry **17** (2008), no. 1, 185–197.
48. A. Dimca, S. Papadima, A.I. Suciu, *Alexander polynomials: Essential variables and multiplicities*, Int. Math. Res. Not. IMRN **2008** (2008), Art. ID rnm119, 36 pp.
49. S. Papadima, A.I. Suciu, *Toric complexes and Artin kernels*, Advances in Math. **220** (2009), no. 2, 441–477.
50. A. Macinic, S. Papadima, *On the monodromy action on Milnor fibers of graphic arrangements*, Topology Appl. **156** (2009), no. 4, 761–774.
51. A. Dimca, S. Papadima, A.I. Suciu, *Topology and geometry of cohomology jump loci*, Duke Math. Journal **148** (2009), no. 3, 405–457.
52. A. Dimca, S. Papadima, A.I. Suciu, *Non-finiteness properties of fundamental groups of smooth projective varieties*, J. Reine Angew. Math. **629** (2009), 89–105.
53. B. Berceanu, Ş. Papadima, *Universal representations of braid and braid-permutation groups*, J. Knot Theory Ramifications **18** (2009), no. 7, 999–1019.
54. S. Papadima, A. Suciu, *Geometric and algebraic aspects of 1-formality*, Bull. Math. Soc. Sci. Math. Roumanie (N.S.) **52(100)** (2009), no. 3, 355–375.
55. A. Macinic, S. Papadima, *Characteristic varieties of nilpotent groups and applications*, in: Proceedings of the Sixth Congress of Romanian Mathematicians, vol. 1, Romanian Academy, Bucharest, 2009, pp. 57–64.
56. S. Papadima, A.I. Suciu, *The spectral sequence of an equivariant chain complex and homology with local coefficients*, Transactions of the American Mathematical Society **362** (2010), no. 5, 2685–2721.
57. S. Papadima, A.I. Suciu, *Bieri–Neumann–Strebel–Renz invariants and homology jumping loci*, Proc. London Math. Soc. **100** (2010), no. 3, 795–834.
58. S. Papadima, A.I. Suciu, *Algebraic monodromy and obstructions to formality* (with S. Papadima), Forum Mathematicum **22** (2010), no. 5, 973–983.
59. A. Dimca, S. Papadima, A.I. Suciu, *Quasi-Kähler groups, 3-manifold groups, and formality*, Mathematische Zeitschrift **268** (2011), no. 1-2, 169–186.
60. A. Dimca, S. Papadima, *Finite Galois covers, cohomology jump loci, formality properties, and multinets*, Ann. Sc. Norm. Super. Pisa Cl. Sci. **10** (2011), no. 2, 253–268.
61. S. Papadima, A. Suciu, *Homological finiteness in the Johnson filtration of the automorphism group of a free group*, J. Topol. **5** (2012), no. 4, 909–944.
62. A. Dimca, S. Papadima, *Arithmetic group symmetry and finiteness properties of Torelli groups*, Ann. Math. **177** (2013), no. 2, 395–423.
63. A. Dimca, R. Hain, S. Papadima, *The abelianization of the Johnson kernel*, J. Eur. Math. Soc. **16** (2014) no. 4, 805–822.
64. A. Dimca, S. Papadima, *Non-abelian cohomology jump loci from an analytic viewpoint*, Commun. Contemp. Math. **16** (2014), no. 4, 1350025, 47 pp.
65. S. Papadima, A.I. Suciu, *Jump loci in the equivariant spectral sequence*, Math. Res. Lett. **21** (2014), no. 4, 863–883.
66. S. Papadima, A.I. Suciu, *Non-abelian resonance: product and coproduct formulas* (with S. Papadima), in *Bridging Algebra, Geometry, and Topology*, 269–280, Springer Proceedings in Mathematics & Statistics, vol. 96, Springer, Cham, 2014.
67. S. Papadima, A.I. Suciu, *Vanishing resonance and representations of Lie algebras*, J. Reine Angew. Math. **706** (2015), 83–101.
68. A. Dimca, S. Papadima, A.I. Suciu, *Algebraic models, Alexander-type invariants, and Green–Lazarsfeld sets*, Bulletin Mathématique de la Société des Sciences Mathématiques de Roumanie **58** (2015), no. 3, 257–269.
69. A. Macinic, D. Matei, S. Papadima, *On the second nilpotent quotient of higher homotopy groups, for hypersolvable arrangements*, Int. Math. Res. Notices **2015** (2015), no. 24, 13194–13207.
70. A. Măcinic, S. Papadima, R. Popescu, A.I. Suciu, *Flat connections and resonance varieties: from rank one to higher ranks*, Trans. Amer. Math. Soc. **369** (2017), no. 2, 1309–1343.
71. A. Macinic, S. Papadima, R. Popescu, *Modular equalities for complex reflection arrangements*, Doc. Math. **22** (2017), 135–150.
72. B. Berceanu, A. Măcinic, S. Papadima, R. Popescu, *On the geometry and topology of partial configuration spaces of Riemann surfaces*, Algebr. Geom. Topol. **17** (2017), no. 2, 1163–1188.

73. S. Papadima, A.I. Suciu, *The Milnor fibration of a hyperplane arrangement: from modular resonance to algebraic monodromy*, Proc. London Math. Soc. **114** (2017), no. 6, 961–1004.
74. S. Papadima, L. Păunescu, *Rank two jump loci for solvmanifolds and Lie algebras*, Journal of the Mathematical Society of Japan **70** (2018), no. 2, 695–709.
75. M. Aprodu, G. Farkas, S. Papadima, C. Raicu, J. Weyman, *Topological invariants of groups and Koszul modules*, preprint (2018), [arXiv:1806.01702](https://arxiv.org/abs/1806.01702).
76. S. Papadima, A.I. Suciu, *Infinitesimal finiteness obstructions*, Journal of the London Mathematical Society **99** (2019), no. 1, 173–193.
77. S. Papadima, A.I. Suciu, *Naturality properties and comparison results for topological and infinitesimal embedded jump loci*, Advances in Mathematics **350** (2019), 256–303.
78. M. Aprodu, G. Farkas, S. Papadima, C. Raicu, J. Weyman, *Koszul modules and Green’s conjecture*, Invent. Math. **218** (2019), no. 3, 657–720.
79. S. Papadima, A.I. Suciu, *The topology of compact Lie group actions through the lens of finite models*, International Mathematics Research Notices **2019** (2019), no. 20, 6390–6436.
80. S. Papadima, A.I. Suciu, *Rank two topological and infinitesimal embedded jump loci of quasi-projective manifolds*, Journal of the Institute of Mathematics of Jussieu **19** (2020), no. 2, 451–485.