CURRICULUM VITAE

Stefan Papadima

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Personal

Born March 7, 1953, in Bucharest, Romania
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Education

B.S. mathematics, University of Bucharest, 1975
M.S. mathematics, University of Bucharest, 1976
Ph.D. mathematics, University of Bucharest, 1982

Employment

Teacher, High School Vulcan, Bucharest	1976–1980
Junior Researcher, INCREST, Bucharest	1980–1982
Researcher, INCREST, Bucharest	1982–1984
Senior Researcher, INCREST, Bucharest	1984–1990
Senior Researcher, Head of the Geometry and Topology Department, Institute of Mathematics of the Romanian Academy, Bucharest	1990–

Honors

G. Tzitzeica Prize of the Romanian Academy for contributions in Algebraic Topology, 1987

Visiting Positions

- Ohio–State University, Northwestern University (USA), Nov. 1991–March 1992
- Université de Lille 1 (France), Jan.–June 1994
- University of Sydney (Australia), Nov. 1994, Dec. 1995, Nov. 2003
- Université de Nantes (France), Feb.–July 1995, Feb.–July 1996, Sept. 1996–Feb. 1997, Sept. 1997–Feb. 1998, Feb.–July 1999
- Université de Nice (France), Apr.–May 2001, May 2002, Apr.–June 2005
- Université de Dijon (France), June 2001
- Ohio–State University (USA), Jan.–March 2002
- Université de Bordeaux–I (France), March 15–June 15 2003, Jan.–June 2004
- Université Catholique de Louvain (Belgium), October 2005
- Stone Visiting Professor, Northeastern University (USA), Jan.–April 2006

Research Grants

- CEC Mobility Grant, Université de Lille 1, France, April–June 1993
- Volkswagen Stiftung (Research in Pairs program), Oberwolfach Mathematisches Forsch–ungsinstitut, Germany, Oct.–Nov. 1999
- Member Math. Sciences Research Inst. Berkeley, USA, Aug. 15–Dec. 15, 2004
- Senior Guest Scientist, Math. Section International Centre for Theoretical Physics Trieste, Italy, Oct. 15–Nov. 15, 2006
- Romanian Ministry of Education and Research (CERES), 2001–2003
- Romanian Ministry of Education and Research (CNCSIS), 2002, principal investigator
- Romanian Ministry of Education and Research (CERES), 2004–2006
- Romanian Ministry of Education and Research (CEEX), 2005–2007
- Romanian Ministry of Education and Research (CEEX), 2006–2008

Colloquia and Seminars

MSRI Berkeley, Brandeis–Harvard–MIT–NEU Joint Colloquium, Universita di Pisa, Ohio–State University, Northwestern University, University of North Carolina at Chapel Hill, Northeastern University, Sydney University, University of New South Wales, Université de Lille 1, Université de Nantes, Université de Nice, Université de Grenoble, Université de Bordeaux, Université d'Angers, Université de Dijon, Université de Mulhouse, Université Catholique de Louvain, S. Banach Center for Mathematics Warsaw, Steklov Institute Moscow, University of Bucharest, University of Timişoara, University of Iaşi.

Conferences

11th Winter School on Geometry and Physics (Srni, Czech Rep.), Max–Planck Algebraic Homotopy Conference (Schloss Ringberg, Germany), 2nd Gauss Symposium (München, Germany), International Workshop on Differential Geometry (Constanţa, Romania), In-

ternational Conference on Algebraic Geometry, Commutative Algebra and Computer Algebra (Constanţa, Romania), Workshop on Global Analysis, Differential Geometry and Lie Algebras (Thessaloniki, Greece), International Workshop on Differential Geometry (Sibiu, Romania), Workshop on Mathematics Related to Arrangements of Hyperplanes (Tokyo Metropolitan University, Japan), Algebraic Topology Conference (Angers, France), Colloques Tresses (1999, 2001 and 2003, CIRM Luminy, France), Arrangements d'hyperplans complexes (Bordeaux, France), IMAR Workshop on Algebraic Geometry, Commutative Algebra and Topology (Bucharest 2001 and Mamaia 2002, Romania), Workshop on Differential Geometry (Timişoara, Romania), Braids in Cortona (Arezzo, Italy), $5th$ and $6th$ International Congress of Romanian Mathematicians (Piteşti 2003 and Bucharest 2007, Romania), Arrangements of Hyperplanes (Ascona, Switzerland), AMS Special Session on Arrangements and Configuration Spaces (Durham, US), Braids and their ramifications (Cortona, Italy), Mini-workshop on topology of closed one-forms and cohomology jumping loci (Oberwolfach, Germany).

Professional Service

• Member of the Scientific Board of the Institute of Mathematics "Simion Stoilow".
• Scientific Secretary of the Institute of Mathematics "Simion Stoilow", 1990.
• Organizer: Topology Seminar, 1978– ; School on Semi–simple Lie Algebras (Iaşi), 1988; School on Compact Lie Groups (Mamaia), 1989; co-ordination of the Topology team, within the framework of the FP5 European Excellence Grant EURROMMAT of IMAR, 2001–2003.
• Co-organizer: IMAR Workshop on Algebraic Geometry, Commutative Algebra and Topology (Bucharest), 2001; IMAR Conference on Algebraic Geometry, Commutative Algebra and Topology (Mamaia), 2002; International Congress of Romanian Mathematicians (Piteşti, 2003 and Bucharest, 2007); Summer School on Hyperplane Arrangements (Constanţa), 2005.
• Referee (grant proposals): CNCSIS (Romania).
• Referee (PhD theses): Romania, Belgium, Pakistan.
• Reviewer: Zentralblatt für Mathematik, Mathematical Reviews.

Teaching

• University of Bucharest: Elementary group theory; Topics in differential topology; Introduction to combinatorial topology; Projective and euclidean geometry; Singular homology and duality; Algebraic topology via differential forms; The topology and geometry of homogenous spaces; Homotopy groups and spectral sequences; Classification of homotopy types and deformation theory; Vassiliev invariants of knots and braids.
• Şcoala Normală Superioară (Bucharest): Homology, cohomology, Poincaré duality.
• Université de Lille, Université de Nantes, Université de Nice, Université de Bordeaux: Calculus; Linear algebra; Statistics; Elementary group theory and ring theory; Galois theory; Affine, euclidean and projective geometry; Basic algebraic topology; Characteristic classes and global integrability conditions.
• Ohio–State University: Calculus IV; Northeastern University: Rational homotopy theory.

Students

- Octav Cornea, Professor at the University of Montreal;
- Louis Funar, Researcher at CNRS, Université de Grenoble;
- Daniel Matei, Researcher at IMAR Bucharest;
- Andrei Raţiu, Professor at the Technical University of Istanbul;
- Bogdan Bucicovschi, Ph.D. thesis supervised by D. Burghelea at Ohio–State University;
- Radu Popescu, Researcher at IMAR Bucharest;
- Dorin Cheptea, Researcher at IMAR Bucharest;
- Anca Macinic, Junior Researcher at IMAR Bucharest, PhD student, in progress.

Research Directions

My favourite line of research is directed towards applied homotopy theory. I have dealt with various directions of application, such as:
- classification of differentiable manifolds up to finite ambiguity [5, 6];
- submanifolds with additional normal structure [8, 21];
- symmetry and geodesics of compact homogeneous spaces [11–14];
- algebras and graded Lie algebras associated to topological spaces [17, 19, 22, 27, 34, 37, 38, 43];
- topological invariants in codimension two derived from the lower central series via a peripheral marking [18, 20, 25, 28, 29, 32];
- artinian complete intersections in geometry and topology [23, 41, 44];
- universal finite–type invariants of braids [30, 52];
- combinatorial, algebraic and analytical aspects in the topological study of complex algebraic varieties [9, 26, 31, 33, 35, 36, 39, 40, 51];
- toric complexes and Artin kernels [42, 45, 55];
- fundamental groups of smooth algebraic varieties [46, 47, 49, 50];
- cohomology jumping loci [48, 53, 54]

see the list of publications.

Work in Progress and Research Projects

- Alexander invariants, characteristic varieties and resonance varieties;
- fundamental groups of smooth algebraic varieties;
- geometric invariants of groups;
- I-adic completion of higher homotopy groups.

Publications

1. *O formulă de stabilitate pentru $\widehat{A}$–genul ponderat şi o teoremă de anulare a genului $\widehat{A}$* (Romanian), Stud. Cerc. Mat. (2) **29** (1977), 149–157.

2. *Teoria raţională a omotopiei* (Romanian), with L. Paunescu, INCREST Seminar Mono-

graphs, No. 1, 1981, 192 pp.

3. *On the formality of maps*, An. Univ. Timişoara Ser. Ştiinţe Mat. **20** (1982), 30–40.

4. *Homotopie rationnelle des espaces de Thom et problèmes de lissage*, C. R. Acad. Sci. Paris Sér. I Math. **297** (1983), 189–191.

5. *Classification of Poincaré duality algebras over the rationals*, Geom. Dedicata **17** (1984), 199–205.

6. *Poincaré duality algebras and the rational classification of differentiable manifolds*, in: *Homotopie algébrique et algèbre locale (Luminy, 1982)*, pp. 268–272, Astérisque **113–114**, Soc. Math. France, Paris, 1984.

7. *The cellular structure of formal homotopy types*, J. Pure Appl. Alg. **35** (1985), 171–184.

8. *The rational homotopy of Thom spaces and the smoothing of homology classes*, Comment. Math. Helv. **60** (1985), 601–614.

9. *The rational homotopy of Thom spaces and the smoothing of isolated singularities*, Ann. Inst. Fourier (Grenoble) **35** (1985), 119–135.

10. *Propriétés de rigidité des groupes de Lie compacts modulo leurs tores maximaux*, C. R. Acad. Sci. Paris Sér. I Math. **302** (1986), 455–458.

11. *Rigidity properties of compact Lie groups modulo maximal tori*, Math. Ann. **275** (1986), 637–652.

12. *Complex cohomology automorphisms of compact homogenous spaces of positive Euler characteristic*, Suppl. Rend. Circ. Mat. Palermo **16** (1987), 217–226.

13. *Rational homotopy equivalences of Lie type*, Math. Proc. Camb. Phil. Soc. **104** (1988), 65–80.

14. *Discrete symmetry, toral symmetry and the Euler characteristic of differentiable manifolds*, Proc. Amer. Math. Soc. **103** (1988), 612–614.

15. *Ch. XII: Clasificarea algebrelor Lie semi–simple reale* (Romanian), in: *Algebre Lie Semisimple* (B. Berceanu, M. Martin and St. Papadima Eds.), pp. 128–184, IMAR Bucharest Seminar Monographs, No. 1, 1991, 255 pp.

16. *Geometric decompositions, algebraic models and rigidity theorems*, with M. Markl, J. Pure Appl. Alg. **71** (1991), 53–73.

17. *Homotopy Lie algebras and fundamental groups via deformation theory*, with M. Markl, Ann. Inst. Fourier (Grenoble) (4) **42** (1992), 905–935.

18. *Moduli spaces for fundamental groups and link invariants derived from the lower central series*, with M. Markl, Manuscripta Math. **81** (1993), 225–242.

19. *Cohomologically generic 2–complexes and 3–dimensional Poincaré complexes*, with B. Berceanu, Math. Ann. **298** (1994), 457–480.

20. *Moduli spaces for generic low–dimensional complexes*, with B. Berceanu, J. Pure Appl. Alg. **95** (1994), 1–25.

21. *Homotopy Lie algebras and submanifolds*, J. Pure Appl. Alg. **91** (1994), 219–229.

22. *Finite determinacy phenomena for finitely presented groups*, In: *Proceedings of the 2nd Gauss Symposium. Conference A: Mathematics and Theoretical Physics (Munich, 1993)*, pp. 507–528, Sympos. Gaussiana, de Gruyter, Berlin, 1995.

23. *Reduced weighted complete intersection and derivations*, with L. Paunescu, J. Algebra **183** (1996), 595–604.

24. *A rational homotopy analogue of the Poincaré conjecture*, Rev. Roumaine Math. Pures Appl. (1–2) **42** (1997), 121–132.

25. *Campbell–Hausdorff invariants of links*, Proc. London Math. Soc. (3) **75** (1997), 641–670.

26. *A generalization of fiber–type arrangements and a new deformation method*, with M. Jambu, Topology (6) **37** (1998), 1135–1164.

27. *On rational $K[\pi,1]$ spaces and Koszul algebras*, with S. Yuzvinsky, J. Pure Appl. Alg. (2) **144** (1999), 157–167.

28. *Braid commutators and homogenous Campbell–Hausdorff tests*, Pacific Journ. of Math. **197** (2001), 383–416.

29. *On the indeterminacy and the realization of Milnor's $\overline{\mu}$–invariants*, Rev. Roumaine Math. Pures Appl. **46** (2001), 471–487.

30. *The universal finite–type invariant of braids, with integer coefficients*, Topology and its Applications **118** (2002), 169–185.

31. *Deformations of hypersolvable arrangements*, with M. Jambu, Topology and its Applications **118** (2002), 103–111.

32. *Generalized $\overline{\mu}$–invariants for links and hyperplane arrangements*, Proc. London Math. Soc. **84** (2002), 492–512.

33. *Higher homotopy groups of complements of complex hyperplane arrangements*, with A. Suciu, Advances in Math. **165** (2002), 71–100.

34. *Rational homotopy groups and Koszul algebras*, with A. Suciu, C. R. Acad. Sci. Paris Sér. I Math. **335** (2002), 53–58.

35. *Hypersurface complements, Milnor fibers and higher homotopy groups of arrangements*, with A. Dimca, Annals of Math. **158** (2003), 473–507.

36. *Equivariant chain complexes, twisted homology and relative minimality of arrangements*, with A. Dimca, Ann. Scient. Éc. Norm. Sup. **37** (2004), 449–467.

37. *Chen Lie algebras*, with A. Suciu, Internat. Math. Res. Notices **21** (2004), 1057–1086.

38. *Homotopy Lie algebras, lower central series, and the Koszul property*, with A. Suciu, Geometry and Topology **8** (2004), 1079–1125.

39. *Multiplicative models for configuration spaces of algebraic varieties*, with B. Berceanu and M. Markl, Topology **44** (2005), 415–440.

40. *Some analogs of Zariski's theorem on nodal line arrangements*, with A. D. R. Choudary and A. Dimca, Algebraic and Geometric Top. **5** (2005), paper no. 28, 691–711.

41. *Isometry—invariant geodesics and nonpositive derivations of the cohomology*, with L. Paunescu, J. Differential Geometry **71** (2005), 159–176.

42. *Algebraic invariants for right–angled Artin groups*, with A. Suciu, Math. Annalen **334** (2006), 533–555.

43. *When does the associated graded Lie algebra of an arrangement group decompose?*, with A. Suciu, Comment. Math. Helvetici **81** (2006), 859–875.

44. *Closed manifolds coming from Artinian complete intersections*, with L. Paunescu, Trans. Amer. Math. Soc. **359** (2007), 2777–2786.

45. *Algebraic invariants for Bestvina–Brady groups*, with A. Suciu, J. London Math. Soc. **76** (2007), 273–292.

46. *Global versus local algebraic fundamental groups*, in: Topology of closed one-forms and cohomology jumping loci, Oberwolfach Reports **40** (2007), 20–22, European Math. Soc. Publishing House.

47. *Quasi–Kähler Bestvina–Brady groups*, with A. Dimca and A. Suciu, J. Algebraic Geometry **17** (2008), 185–197.

48. *Alexander polynomials: essential variables and multiplicities*, with A. Dimca and A. Suciu, Internat. Math. Res. Notices, vol. **2008** (2008), article ID rnm119, 36 pp.

49. *Non–finiteness properties of fundamental groups of smooth projective varieties*, with A. Dimca and A. Suciu, J. Reine Angew. Math., to appear; available in preprint form at `arXiv:math/0609456`.

50. *Formality, Alexander invariants, and a question of Serre*, with A. Dimca and A. Suciu, preprint `arXiv:math/0512480`.

51. *On the monodromy action on Milnor fibers of graphic arrangements*, with A. Macinic, preprint `arXiv:math/0609075`.

52. *Universal representations of braid and braid-permutation groups*, with B. Berceanu, J. Knot Theory Ramif., to appear; available in preprint form at `arXiv:0708.0634`.

53. *The spectral sequence of an equivariant chain complex and homology with local coefficients*, with A. Suciu, preprint `arXiv:0708.4262`.

54. *Characteristic varieties of nilpotent groups and applications*, with A. Macinic, preprint `arXiv:0710.5398`.

55. *Toric complexes and Artin kernels*, with A. Suciu, preprint `arXiv:0801.3626`.