

## CURRICULUM VITAE - TEODOR BANICA

Professor of Mathematics  
University of Cergy-Pontoise  
Born 05/25/1973 at Bucharest  
Romanian and French citizen

### ADDRESS

Department of Mathematics  
University of Cergy-Pontoise  
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### EDUCATION

1991-92: First year student, University of Bucharest  
1992-94: Student at the Ecole Normale Superieure, Paris  
1994-96: Ph.D. student at Paris 7 University

### EMPLOYMENT

1996-98: CNRS researcher, Institute of Mathematics of Marseille  
1998-99: CNRS researcher, Institute of Mathematics of Paris  
1999-00: Charles B. Morrey Jr. Assistant Professor, UC Berkeley  
2000-04: CNRS researcher, Institute of Mathematics of Paris  
2004-09: Professor of Mathematics, University of Toulouse  
2009- : Professor of Mathematics, University of Cergy-Pontoise

### TEACHING

1994-96: Teaching assistant at Paris 7 University  
Mathematics - 1st year (Fall 1994)  
Linear algebra - 2nd year (Fall 1995)  
1999-00: Assistant professor at UC Berkeley  
Abstract algebra - 3rd year (Fall 1999)  
Measure theory - 4th year (Fall 1999)  
Real analysis - 3rd year (Spring 2000)  
2003-04: Lecturer at Paris 7 University  
Operator algebras - 5th year (Fall 2003)

- 2004-09: Professor at the University of Toulouse  
Analysis - 2nd year (Fall 2004)  
Integral calculus - 3rd year (Fall 2004)  
Maple and R - 2nd year (Fall 2005)  
Measure theory - 3rd year (Fall 2005)  
Integral calculus - 3rd year (Fall 2005)  
Quantum groups - 5th year (Fall 2005)  
Linear algebra - 2nd year (Fall 2006)  
Measure theory - 3rd year (Fall 2006)  
Abstract algebra - 2nd year (Spring 2007)  
Probability - 3rd year (Spring 2007)  
Differential equations - 2nd year (Spring 2008)  
Fourier analysis - 3rd year (Spring 2008)  
Mathematics - 1st year (Fall 2008)  
Linear algebra - 2nd year (Fall 2008)
- 2009- : Professor at the University of Cergy-Pontoise  
Linear algebra - 2nd year (Spring 2010)  
Abstract algebra - 4th year (Spring 2010)  
Free probability - 5th year (Spring 2010)  
Mathematics - 1st year (Fall 2010)  
Dynamical systems - 4th year (Fall 2010)  
Abstract algebra - 4th year (Spring 2011)  
Quantum groups - 5th year (Spring 2011)  
Mathematics - 1st year (Fall 2011)  
Dynamical systems - 4th year (Fall 2011)  
Abstract algebra - 4th year (Spring 2012)  
Quantum groups - 5th year (Spring 2012)  
Probability - 3rd year (Fall 2012)  
Dynamical systems - 4th year (Fall 2012)  
Linear algebra - 2nd year (Spring 2013)  
Abstract algebra - 4th year (Spring 2013)  
Real analysis - 2nd year (Fall 2013)  
Dynamical systems - 4th year (Fall 2013)  
Linear algebra - 2nd year (Spring 2014)  
Probability - 2nd year (Spring 2014)  
Mathematics - 1st year (Spring 2015)  
Real analysis - 2nd year (Spring 2015)  
Functional analysis - 4th year (Spring 2015)  
Optimization - 4th year (Spring 2015)  
Mathematics - 1st year (Fall 2015)

Linear algebra - 2nd year (Fall 2015)  
 Real analysis - 2nd year (Spring 2016)  
 Functional analysis - 4th year (Spring 2016)  
 Linear algebra - 2nd year (Fall 2016)  
 Functional analysis - 4th year (Fall 2016)  
 Real analysis - 2nd year (Spring 2017)  
 Probability - 5th year (Spring 2017)  
 Linear algebra - 2nd year (Fall 2017)  
 Functional analysis - 4th year (Fall 2017)  
 Probability - 5th year (Fall 2017)  
 Real analysis - 2nd year (Spring 2018)

## ADMINISTRATION

- 1994- : Organization of seminars
  - Student seminar “Operator algebras”, Paris 1994-96
  - Seminar “Noncommutative geometry”, Toulouse 2004-06
  - Seminar “Geometry and physics”, Toulouse 2006-07
  - Seminar “Random matrices”, Toulouse 2007-08
  - Seminar “Probability”, Cergy 2010-11
- 1996- : Computer administration and maintenance
  - Webmaster “Operator algebra team, Marseille”, 1996-98
  - Webmaster “Operator algebra team, Paris”, 1998-04
  - Webmaster “Laboratoire Emile Picard, Toulouse”, 2004-08
- 2002- : Organization of conferences
  - Conference “Groups”, Paris 2002
  - Conference “Quantum groups”, Strasbourg 2008
  - Conference “Quantum groups”, Toulouse 2009
  - Conference “Polynomial integrals and applications”, Cergy 2010
  - Conference “Quantum groups”, Clermont 2010
  - Conference “Algebra”, Cergy 2013
- 2004- : Hiring committee work
  - Hiring committee in mathematics, Toulouse 2004-08
  - Hiring committee for a junior position in mathematics, Montpellier 2009
  - Hiring committee for a junior position in mathematics, Besançon 2012
- 2005- : General campus administration
  - Institute of Mathematics of Toulouse Council, 2005-08
  - Laboratoire Emile Picard of Toulouse Council, 2006-08
  - Laboratoire AGM of Cergy-Pontoise Council, 2009-11
- 2016- : Scientific editorial work
  - Editor of Advances in Operator Theory, since 2016

## STUDENTS

- 2005-06: L. Masserey, M.Sc. Toulouse 3 University, 06/06  
 Memoir: Compact matrix quantum groups of Kac type
- 2012-15: L. Pittau, Ph.D. Cergy-Pontoise University, 10/15  
 Thesis: Free wreath products by quantum automorphism groups
- 2016-17: D. Özteke, M.Sc. Cergy-Pontoise University, 06/17  
 Memoir: Isolated complex Hadamard matrices

## AWARDS

- 1989: Gold medal at the 30th IMO, Braunschweig
- 1990: Gold medal at the 31st IMO, Beijing
- 1991: Gold medal at the 32nd IMO, Sigtuna
- 2012: G. de B. Robinson award (with S.T. Belinschi, M. Capitaine, B. Collins)

## PUBLICATIONS

- [1] T. Banica, On the polar decomposition of circular variables, *Integral Equations Operator Theory* **24** (1996), 372–377.
- [2] T. Banica, The representation theory of free orthogonal quantum groups, *C. R. Acad. Sci. Paris Ser. I Math.* **322** (1996), 241–244.
- [3] T. Banica, The free unitary compact quantum group, *Comm. Math. Phys.* **190** (1997), 143–172.
- [4] T. Banica, Hopf algebras and subfactors associated to vertex models, *J. Funct. Anal.* **159** (1998), 243–266.
- [5] T. Banica, Representations of compact quantum groups and subfactors, *J. Reine Angew. Math.* **509** (1999), 167–198.
- [6] T. Banica, Fusion rules for representations of compact quantum groups, *Exposition. Math.* **17** (1999), 313–337.
- [7] T. Banica, Symmetries of a generic coaction, *Math. Ann.* **314** (1999), 763–780.
- [8] T. Banica, Compact Kac algebras and commuting squares, *J. Funct. Anal.* **176** (2000), 80–99.
- [9] T. Banica, Subfactors associated to compact Kac algebras, *Integral Equations Operator Theory* **39** (2001), 1–14.

- [10] T. Banica, Quantum groups and Fuss-Catalan algebras, *Comm. Math. Phys.* **226** (2002), 221–232.
- [11] T. Banica, The planar algebra of a coaction, *J. Operator Theory* **53** (2005), 119–158.
- [12] T. Banica, Quantum automorphism groups of small metric spaces, *Pacific J. Math.* **219** (2005), 27–51.
- [13] T. Banica, Quantum automorphism groups of homogeneous graphs, *J. Funct. Anal.* **224** (2005), 243–280.
- [14] T. Banica and S. Moroianu, On the structure of quantum permutation groups, *Proc. Amer. Math. Soc.* **135** (2007), 21–29.
- [15] T. Banica and J. Bichon, Free product formulae for quantum permutation groups, *J. Inst. Math. Jussieu* **6** (2007), 381–414.
- [16] T. Banica and B. Collins, Integration over compact quantum groups, *Publ. Res. Inst. Math. Sci.* **43** (2007), 277–302.
- [17] T. Banica and J. Bichon, Quantum automorphism groups of vertex-transitive graphs of order  $\leq 11$ , *J. Algebraic Combin.* **26** (2007), 83–105.
- [18] T. Banica and D. Bisch, Spectral measures of small index principal graphs, *Comm. Math. Phys.* **269** (2007), 259–281.
- [19] T. Banica, J. Bichon and G. Chenevier, Graphs having no quantum symmetry, *Ann. Inst. Fourier* **57** (2007), 955–971.
- [20] T. Banica and B. Collins, Integration over quantum permutation groups, *J. Funct. Anal.* **242** (2007), 641–657.
- [21] T. Banica and R. Nicoara, Quantum groups and Hadamard matrices, *Panamer. Math. J.* **17** (2007), 1–24.
- [22] T. Banica, J. Bichon and B. Collins, Quantum permutation groups: a survey, *Banach Center Publ.* **78** (2007), 13–34.
- [23] T. Banica, J. Bichon and B. Collins, The hyperoctahedral quantum group, *J. Ramanujan Math. Soc.* **22** (2007), 345–384.
- [24] T. Banica and B. Collins, Integration over the Pauli quantum group, *J. Geom. Phys.* **58** (2008), 942–961.
- [25] T. Banica, A note on free quantum groups, *Ann. Math. Blaise Pascal* **15** (2008), 135–146.

- [26] T. Banica and R. Vergnioux, Growth estimates for discrete quantum groups, *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* **12** (2009), 321–340.
- [27] T. Banica and J. Bichon, Quantum groups acting on 4 points, *J. Reine Angew. Math.* **626** (2009), 74–114.
- [28] T. Banica, Cyclotomic expansion of exceptional spectral measures, *Internat. J. Math.* **20** (2009), 275–297.
- [29] T. Banica and R. Vergnioux, Fusion rules for quantum reflection groups, *J. Non-commut. Geom.* **3** (2009), 327–359.
- [30] T. Banica and R. Speicher, Liberation of orthogonal Lie groups, *Adv. Math.* **222** (2009), 1461–1501.
- [31] T. Banica, B. Collins and P. Zinn-Justin, Spectral analysis of the free orthogonal matrix, *Int. Math. Res. Not.* **17** (2009), 3286–3309.
- [32] T. Banica, J. Bichon and J.-M. Schlenker, Representations of quantum permutation algebras, *J. Funct. Anal.* **257** (2009), 2864–2910.
- [33] T. Banica and J. Bichon, Hopf images and inner faithful representations, *Glasg. Math. J.* **52** (2010), 677–703.
- [34] T. Banica, B. Collins and J.-M. Schlenker, On orthogonal matrices maximizing the 1-norm, *Indiana Univ. Math. J.* **59** (2010), 839–856.
- [35] T. Banica and R. Vergnioux, Invariants of the half-liberated orthogonal group, *Ann. Inst. Fourier* **60** (2010), 2137–2164.
- [36] T. Banica and D. Goswami, Quantum isometries and noncommutative spheres, *Comm. Math. Phys.* **298** (2010), 343–356.
- [37] T. Banica, S. Curran and R. Speicher, Classification results for easy quantum groups, *Pacific J. Math.* **247** (2010), 1–26.
- [38] T. Banica, The orthogonal Weingarten formula in compact form, *Lett. Math. Phys.* **91** (2010), 105–118.
- [39] T. Banica and S. Curran, Decomposition results for Gram matrix determinants, *J. Math. Phys.* **51** (2010), 1–14.
- [40] T. Banica, S.T. Belinschi, M. Capitaine and B. Collins, Free Bessel laws, *Canad. J. Math.* **63** (2011), 3–37.
- [41] T. Banica, S. Curran and R. Speicher, Stochastic aspects of easy quantum groups, *Probab. Theory Related Fields* **149** (2011), 435–462.

- [42] T. Banica, B. Collins and J.-M. Schlenker, On polynomial integrals over the orthogonal group, *J. Combin. Theory Ser. A* **118** (2011), 778–795.
- [43] T. Banica, J. Bichon and S. Curran, Quantum automorphisms of twisted group algebras and free hypergeometric laws, *Proc. Amer. Math. Soc.* **139** (2011), 3961–3971.
- [44] T. Banica and A. Skalski, Two-parameter families of quantum symmetry groups, *J. Funct. Anal.* **260** (2011), 3252–3282.
- [45] T. Banica and J.-M. Schlenker, Combinatorial aspects of orthogonal group integrals, *Internat. J. Math.* **22** (2011), 1611–1646.
- [46] T. Banica, S. Curran and R. Speicher, De Finetti theorems for easy quantum groups, *Ann. Probab.* **40** (2012), 401–435.
- [47] T. Banica and A. Skalski, Quantum isometry groups of duals of free powers of cyclic groups, *Int. Math. Res. Not.* **9** (2012), 2094–2122.
- [48] T. Banica, J. Bichon and S. Natale, Finite quantum groups and quantum permutation groups, *Adv. Math.* **229** (2012), 3320–3338.
- [49] T. Banica, Quantum permutations, Hadamard matrices, and the search for matrix models, *Banach Center Publ.* **98** (2012), 11–42.
- [50] T. Banica, A. Skalski and P.M. Sołtan, Noncommutative homogeneous spaces: the matrix case, *J. Geom. Phys.* **62** (2012), 1451–1466.
- [51] T. Banica, U. Franz and A. Skalski, Idempotent states and the inner linearity property, *Bull. Pol. Acad. Sci. Math.* **60** (2012), 123–132.
- [52] T. Banica, J. Bhowmick and K. De Commer, Quantum isometries and group dual subgroups, *Ann. Math. Blaise Pascal* **19** (2012), 17–43.
- [53] T. Banica, I. Nechita and K. Życzkowski, Almost Hadamard matrices: general theory and examples, *Open Syst. Inf. Dyn.* **19** (2012), 1–26.
- [54] T. Banica and I. Nechita, Asymptotic eigenvalue distributions of block-transposed Wishart matrices, *J. Theoret. Probab.* **26** (2013), 855–869.
- [55] T. Banica, J. Bichon, B. Collins and S. Curran, A maximality result for orthogonal quantum groups, *Comm. Algebra* **41** (2013), 656–665.
- [56] T. Banica and A. Skalski, Quantum symmetry groups of  $C^*$ -algebras equipped with orthogonal filtrations, *Proc. Lond. Math. Soc.* **106** (2013), 980–1004.
- [57] T. Banica, The defect of generalized Fourier matrices, *Linear Algebra Appl.* **438** (2013), 3667–3688.

- [58] T. Banica and I. Nechita, Almost Hadamard matrices: the case of arbitrary exponents, *Discrete Appl. Math.* **161** (2013), 2367–2379.
- [59] T. Banica, I. Nechita, J.-M. Schlenker, Analytic aspects of the circulant Hadamard conjecture, *Ann. Math. Blaise Pascal* **21** (2014), 25–59.
- [60] T. Banica, First order deformations of the Fourier matrix, *J. Math. Phys.* **55** (2014), 1–22.
- [61] T. Banica, I. Nechita and J.-M. Schlenker, Submatrices of Hadamard matrices: complementation results, *Electron. J. Linear Algebra* **27** (2014), 197–212.
- [62] T. Banica, Counting results for thin Butson matrices, *Electron. J. Combin.* **21** (2014), 1–14.
- [63] T. Banica, Truncation and duality results for Hopf image algebras, *Bull. Pol. Acad. Sci. Math.* **62** (2014), 161–179.
- [64] T. Banica and I. Nechita, Block-modified Wishart matrices and free Poisson laws, *Houston J. Math.* **41** (2015), 113–134.
- [65] T. Banica and A. Skalski, The quantum algebra of partial Hadamard matrices, *Linear Algebra Appl.* **469** (2015), 364–380.
- [66] T. Banica and J. Bichon, Random walk questions for linear quantum groups, *Int. Math. Res. Not.* **24** (2015), 13406–13436.
- [67] T. Banica, The glow of Fourier matrices: universality and fluctuations, *Oper. Matrices* **9** (2015), 457–474.
- [68] T. Banica, Liberations and twists of real and complex spheres, *J. Geom. Phys.* **96** (2015), 1–25.
- [69] T. Banica, Quantum isometries of noncommutative polygonal spheres, *Münster J. Math.* **8** (2015), 253–284.
- [70] T. Banica and S. Mészáros, Uniqueness results for noncommutative spheres and projective spaces, *Illinois J. Math.* **59** (2015), 219–233.
- [71] T. Banica, The algebraic structure of quantum partial isometries, *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* **19** (2016), 1–36.
- [72] T. Banica, A duality principle for noncommutative cubes and spheres, *J. Noncommut. Geom.* **10** (2016), 1043–1081.
- [73] T. Banica, Half-liberated manifolds, and their quantum isometries, *Glasg. Math. J.* **59** (2017), 463–492.



- [74] T. Banica, Liberation theory for noncommutative homogeneous spaces, *Ann. Fac. Sci. Toulouse Math.* **26** (2017), 127–156.
- [75] T. Banica, Quantum isometries, noncommutative spheres, and related integrals, *Banach Center Publ.* **111** (2017), 101–144.
- [76] T. Banica and I. Nechita, Flat matrix models for quantum permutation groups, *Adv. Appl. Math.* **83** (2017), 24–46.
- [77] T. Banica, Deformed Fourier models with formal parameters, *Studia Math.* **239** (2017), 201–224.
- [78] T. Banica, Quantum groups from stationary matrix models, *Colloq. Math.* **148** (2017), 247–267.
- [79] T. Banica, Weingarten integration over noncommutative homogeneous spaces, *Ann. Math. Blaise Pascal* **24** (2017), 195–224.
- [80] T. Banica and J. Bichon, Matrix models for noncommutative algebraic manifolds, *J. Lond. Math. Soc.* **95** (2017), 519–540.
- [81] T. Banica and J. Bichon, Complex analogues of the half-classical geometry, *Münster J. Math.* **10** (2017), 457–483.
- [82] T. Banica and A. Chirvasitu, Thoma type results for discrete quantum groups, *Internat. J. Math.* **28** (2017), 1–23.
- [83] T. Banica and I. Nechita, Almost Hadamard matrices with complex entries, *Adv. Oper. Theory* **3** (2018), 149–189.
- [84] T. Banica and I. Patri, Maximal torus theory for compact quantum groups, *Illinois J. Math.*, to appear.
- [85] T. Banica, Complex Hadamard matrices with noncommutative entries, *Ann. Funct. Anal.*, to appear.
- [86] T. Banica, Tannakian duality for affine homogeneous spaces, *Canad. Math. Bull.*, to appear.
- [87] T. Banica, Unitary easy quantum groups: geometric aspects, *J. Geom. Phys.*, to appear.
- [88] T. Banica, The planar algebra of a fixed point subfactor, preprint, revised 12/17.
- [89] T. Banica and A. Freslon, Modelling questions for quantum permutations, preprint 2017.
- [90] T. Banica, Super-easy quantum groups: definition and examples, preprint 2017.

[91] T. Banica, D. Özteke and L. Pittau, Isolated partial Hadamard matrices, and related topics, preprint 2017.

[92] T. Banica, Rigidity questions for real half-classical manifolds, preprint 2017.

[93] T. Banica and A. Chirvasitu, Quasi-flat representations of uniform groups and quantum groups, preprint 2017.

[94] T. Banica, Block-modified Wishart matrices: the easy case, preprint 2017.

[95] T. Banica and A. Chirvasitu, Stationarity questions for transitive quantum groups, preprint 2017.

[96] T. Banica, Higher transitive quantum groups: theory and models, preprint 2017.