ALESSANDRA FRABETTI – CURRICULUM VITAE – 2021

Civil status: Alessandra Frabetti, born in 1967, italian, married, 1 son.

Address: Institut Camille Jordan,   tel.: ++33 (0)4 72 44 79 31
Université de Lyon 1,   fax: ++33 (0)4 72 43 16 87
43, bd. du 11 novembre 1918,   e-mail: frabetti@math.univ-lyon1.fr
69622 Villeurbanne   http://math.univ-lyon1.fr/∼frabetti

Positions:

since 2001: Associate professor at Lyon University, Department of Mathematics, France.

2000–2001: FNRS researcher at Lausanne University, Switzerland.

1998–2000: CNRS researcher (TMR Marie Curie) at I.R.M.A. Strasbourg, France.

1998 (6 months): Researcher at Ancona University, Italy.

1997–1998: CNR researcher at I.R.M.A. Strasbourg, France.

Ph.D. thesis:
(Co)homology of dialgebras, under the supervision of J.-L. Loday (IRMA Strasbourg), defended in 1997 at Roma University "La Sapienza" (president C. Procesi), Italy.

Administration:

Local: Hiring committees in Maths, Lyon 2004–2008, Angers 2016, Calais 2018, Poitiers 2019, Mulhouse 2020.
Research committee of Math Department, Lyon University 2005–2007.
Scientific committee of Institut Camille Jordan, Lyon University 2007–2010, since 2021.
Training committee of Math Department, Lyon University 2016–2018.
Director of 1st year undergraduate school in Math, Lyon University since 2021.

National: National University Council (CNU), 2003–2007 and 2007–2010 (board assessor).
National Research Agency (ANR), committee member 2014-2016.
National Institut of Mathematics (INSMI-CNRS), scientific committee (CSI) member 2019-2023.

Teaching:

Undergraduate: Lectures and exercices in algebra, analysis and geometry at Lyon University since 2001.

Master: Exercices of geometry for M1, at Lyon University since 2004.
Lectures on "Feynman diagrams, trees and series" for M2 (with D. Perrot), Lyon 2006.
Lectures on "Differential geometry for Yang-Mills and gravitational fields" for M2, Lyon 2010.

Ph.D.:   Lectures on "Hopf algebras and renormalization", Summer school at Villa de Leyva (Colombia), 2007.
Lectures on "Basic quantum field theory for mathematicians", Luxembourg University, 2009.
Lectures on "Combinatorial Hopf algebras and operads", Córdoba (Argentina), 2011.
Lectures on "Hopf algebras and quantum field theory", Summer school at Buenos Aires (Argentina), 2019.

Supervision: 3 students of Master 2nd year (N. Avrain 2006, N. Marie 2009, F. Lahoub 2010).
3 students of Master 1st year (L. Tabbara 2008, A. Yayla 2019, B. Erdogan 2021).

Teachers training: Training to hiring examination for high-school teachers in mathematics, Bologna (Italy), 1999.

Research:

Subject: Algebraic and geometric methods in QFT; renormalization Hopf algebras; proalgebraic loops; groupoids.

Talks: – over 30 invitations to conferences or special schools as a plenary speaker since 1997 (Perimeter Institut, Buenos Aires, Ottawa, Potsdam, Mendoza, Chern Inst. Nankai, Luxembourg, Cargèse, MPI Bonn and Leipzig, Villa de Leyva, Medellin, ESI Vienna, Vanderbilt, Banff, CIRM, Moscow, Montreal, Strasbourg).
– over 50 talks in seminars or working groups since 1995 (Québec, Dublin, Shanghai, DESY Hamburg, CPHT Polytech., Roma 1, Roma 2, Jussieu, Paris 13, Clermont, Nice, Bochum, MSRI, Fields Inst., Strasbourg).

Meetings org.: 8 international meetings since 2000 (in Lyon, MPI Leipzig, IHES, Perugia, Ancona).
7 national meetings, seminars or working groups since 1997.

Referee: for 7 journals of mathematics and 3 journals of physics.

Defends committee: 4 Ph.D. thesis (referee for D. Harrivel 2005, J. Leray 2017).
1 Habilitation thesis (S. Giraudo 2017).

Grants: ANR AHBE 2006–2008, dir. F. Patras (Nice).
ANR HopfCombOp 2006–2009, dir. J.-Y. Thibon (Marne la Vallée).
GDR Renormalization 2010–2022, dir. S. Paycha, D. Manchon (Clermont-Ferrand), F. Patras (Nice).
COFECUB Exchange program Saõ Paulo - France, 2016–2017

Publications:

In preparation:

16. *A geometric perspective on Regularity Structures* (with S. Azzali, Y. Boutaïb and S. Paycha).

Peer reviewed papers on algebraic methods in quantum field theory:

15. *Loop of formal diffeomorphisms and Faà di Bruno coloop bialgebra* (with I. Shestakov), Adv. Math. **351** (2019) 495-569.

14. *Five interpretations of the Faà di Bruno's formula* (with D. Manchon), Proceedings of the Conference on "Dyson-Schwinger Equations and Faà di Bruno Hopf Algebras in Physics and Combinatorics", IRMA Lectures in Mathematics and Theoretical Physics Vol. 21, European Mathematical Society, 2015.

13. *Combinatorial Hopf algebras from renormalization* (with Ch. Brouder and F. Menous), J. of Algebraic Combinatorics **32** (2010) 557-578.

12. *From quantum electrodynamics to Tamari posets of trees* (with F. Chapoton), Proceedings of the Conference on "Combinatorics and Physics", MPIM Bonn (Germany), december 2006 and march 2007; Cont. Mathematics **539**, AMS, 2011.

11. *Renormalization Hopf algebras and combinatorial groups*, Proceedings of the Summer School "Geometric and topological methods for quantum field theory", Villa de Leyva (Colombia), juillet 2007; Cambridge University Press, 2010.

10. *Groups of tree-expanded formal series*, J. of Algebra **319** (2008) 377-413.

9. *Non-commutative Hopf algebra of formal diffeomorphisms* (with Ch. Brouder and Ch. Krattenthaler), Adv. in Math. **200** n. 2 (2006) 479–524.

8. *Quantum field theory and Hopf algebra cohomology* (with Ch. Brouder, B. Fauser and R. Oeckl) , J. Phys. A **37** (2004) 5895-5927.

7. *QED Hopf algebra on planar binary trees* (with Ch. Brouder), J. of Alg. **267** (2003) 298-322.

6. *Renormalization of QED with trees* (with Ch. Brouder), Eur. Phys. J. C, **19** (2001) 715-741.

Peer reviewed papers on Leibniz algebras and dialgebras:

5. *On Leibniz cohomology of vector fields* (with F. Wagemann), Ann. Global Anal. Geom. **21** (2002) 177-190.

4. *Dialgebra (co)homology with coefficients*, in "Dialgebras and related Operads", Springer Lect. N. Math. 1763, 2001.

3. *Simplicial properties of the set of planar binary trees*, J. Alg. Comb., **13** (2001) 41-65.

2. *Leibniz homology of dialgebras of matrices*, J. Pure Appl. Alg., **129** (1998) 123-141.

1. *Dialgebra homology of associative algebras*, Note aux C. R. Acad. Sci. Paris, **t. 325** (1997) 135-140.

Proceedings without peer review:

7. *Noncommutative version of Borcherds' approach to quantum field theory* (with Ch. Brouder and V.N. Dang), PoS - Proceedings of Science, SISSA, 2015. Frontiers of Fundamental Physics 14 (FFP14) **224** (2016) n.134.

6. *Groupes de séries et renormalisation des champs quantiques*, Publ. Femmes et Mathématiques **7** (2003) 39-52.

5. *Trees and renormalization of QED*, Proceedings des IVes Renc. Math. de Glanon - "Algèbre et géométrie. Application à la physique", juillet 2000, RMGIV (2001) 25-36.

4. *Leibniz algebras and dialgebras*, Proceedings de "Young Algebra Seminar 1998/1999", Publ. Università di Roma II - Tor Vergata, n. 25 (1999) 15-30.

3. *Leibniz homology, relationship with Poisson manifolds, Gelfand-Fuchs cohomology and dialgebras*, Proceedings des IIes Renc. Math. de Glanon - "Algèbre et géométrie. Application à la physique", juin 1998, RMGII (1999) 25-37.

2. *(Co)omologia delle Dialgebre*, Bollettino U.M.I. **8** 1-A Suppl. (1998) 35-38.

1. *Homologie des digèbres*, Proceedings du colloque "Topologie Algébrique", Matagne-la-petite, novembre 1996, (1997) 1-11.

As an editor:

1. *Special Issue dedicated to the proceedings of the conference "Physics and Mathematics"* held at IHES, november 2005 (with S. Paycha), Lett. Math. Phys. **78** vol.3 (2006).