PUBLICATIONS

SYLVIE PAYCHA

Books

1. (with S.Albeverio, J. Jost and S.Scarlatti) *A mathematical introduction to string theory-variational problems, geometric and probabilistic methods*, Cambridge University Press (1997)

2. *Regularised integrals, sums and traces; analytic aspects*, American Mathematical Society University Lecture Notes, Vol. 59 (2012)

Refereed journal publications

1. (with S.Albeverio, R. Hoegh-Krohn, S.Scarlatti) *Path space measure for the Liouville quantum field theory and the construction of relativistic strings*, Phys. Letters B. **174** (1986)

2. *Mesures et déterminants en dimension infinie dans le modèle de Polyakov* , Comptes rendus Acad. Sci., Paris, t.**309** Série I, p.201-204 (1989)

3. (with S.Albeverio, R. Hoegh-Krohn, S.Scarlatti) *A global and stochastic analysis approach to bosonic strings and associated quantum fields*, Acta Appl. Math. **26**, p.103-195 (1992)

4. *The Faddeev Popov procedure and application to bosonic strings: an infinite dimensional point of view*, Comm. Math. Phys. **147**, p.163-180 (1992)

5. *Elliptic operators in the functional quantisation for gauge theories*, Comm. Math. Phys. **166**, p.433-455 (1995)

6. (with M.Arnaudon) *Factorisation of semi-martingales on principal fibre bundles*, Stoch. and Stoch. Reports **53**, p.81-107 (1995)

7. (with M. Arnaudon) *Sochastic tools on Hilbert manifolds; Interplay with geometry and physics*, Comm. Math. Phys. **187**, p.243-260 (1997)

8. (with M. Arnaudon) *Regularisable and minimal orbits for group actions in infinite dimensions*, Comm. Math. Phys. **191**, p.641-662 (1998)

9. (with M. Arnaudon and Y. Belopolskaya) *Renormalized Laplacians on a class of Hilbert manifolds and a Bochner-Weitzenböck type formula for current groups*, Infinite Dimensional Analysis, Quantum Prob. Rel. Topics Vol. **3**, n.1 p.53-98 (2001)

10. (survey) *Renormalized traces as a looking glass into infinite dimensional geometry*, Infinite dimensional Analysis, Quantum Prob. and Rel. Topics, Vol. **4** , N.2 p.221-266 (2001)

11. (with A. Cardona, C. Ducourtioux, J.P. Magnot) *Weighted traces on algebras of pseudo-differential operators and geometry on loop groups*, Infinite dimensional Analysis, Quantum Prob. Rel. Topics Vol. **5** n.4, p. 503-540 (2002)

12. (with A. Cardona, C. Ducourtioux) *From tracial anomalies to anomalies in quantum field theory*, Comm. Math. Phys. **242**, p. 31–65 (2003)

13. (with S. Rosenberg) *Curvature on determinant bundles and first Chern forms*, Journ. Geom. Phys. **45**, p.393-429 (2003)

14. (with S. Rosenberg) *Conformal anomalies via canonical traces* in "Analysis, geometry and topology of elliptic operators", Ed. B. Booss-Bavnbeck, S. Klimek, M. Lesch, W. Zhang, World Scientific p. 263-294 (2006)

15. (with S. Scott) *Chern-Weil forms associated with superconnections* in "Analysis, geometry and topology of elliptic operators", Ed. B. Booss-Bavnbeck, S. Klimek, M. Lesch, W. Zhang, World Scientific p.79-104 (2006)

16. (with D. Manchon) *Shuffle relations for regularised integrals of symbols* Communications in Mathematical Physics **270** p. 13-51 (2007)

17. (with S. Scott) *A Laurent expansion for regularised integrals of holomorphic symbols*, Geom. And Funct. Anal. (2) **17** p. 491-536 (2007)

18. (with J.-M. Lescure) *Traces on pseudodifferential operators and associated determinants*, Proc. London Math. Soc. (2) **94** p. 772-812 (2007)

19. *(Second) quantised resolvents and regularised traces*, Journ. Geom. Phys. **57** p. 1345-1369 (2007)

20. (with J. Mickelsson) *Renormalised Chern-Weil forms associated with families of Dirac operators*, Journ. of Geom. Phys.**57** p. 1789-1814 (2007)

21. *Renormalised multiple integrals of symbols with linear constraints*, Comm. Math. Phys. Vol. **286** p. 495-540 (2009)

22. (with D. Manchon) *Nested sums of symbols and renormalised multiple zeta values*, Int. Math. Research Notices, Vol 2010, N. **24**, p. 4628-4697

23. *A canonical trace associated with spectral triples*, SIGMA **6** (2010), 077, 17 pages (http://www.emis.de/journals/SIGMA/2010/077/)

24. (with J. Mickelsson) *The logarithmic residue density of a generalized Laplacian*, Journ. of the Austr. Math. Soc. Vol. **90**, N. 01, p. 53 – 80 (2011)

25. *Paths towards and extension of Chern-Weil calculus to a class of infinite dimensional vector bundles*, Geom. and Top. Methods for Quantum Field Theory, Proceedings of the 2009 Villa de Leyva Summer School, Cambridge University Press, 2011

26. *Noncommutative formal Taylor expansions and second quantised regularised traces*, in "Combinatorics and Physics" (Ed. K. Ebrahimi-Fard, M. Marcolli, W.D. van Suijlekom) Contemporary Mathematics **539** p. 349-376, Amer. Math. Soc. (2011)

27. (with L. Guo and B. Zhang) *Renormalization by Birkhoff factorization and by generalized evaluators; a study case* in "Noncommutative Geometry, Arithmetic and Related Topics", (Ed. A. Connes, K. Consani) John Hopkins Univ. Press p.183– 211 (2011)

28. (with M-F. Ouedraogo) *The multiplicative anomaly for determinants revisited; locality*, Comm. Math. Annal. **12** p. 28-63 (2012)

29. *Divergent multiple sums and integrals with constraints: a comparative study* in "Noncommutative geometry and physics: Renormalisation, Motives, Index theory", EMS publishing house p.103-174 (2012)

30. *Affine transformations on symbols*, in **Analysis, Geometry and Quantum Field Theory** (Ed. C. L. Aldana, M. Braverman, B. Iochum, C. Neira-Jimenez), Contemporary Mathematics **584**, Amer. Math. Soc. p. 199–222 (2012)

31. (with L. Guo and B. Zhang) *Counting an infinite number of points: a testing ground for renormalization methods*, "Topological and geometric methods for quantum field theory", Villa de Leyva, World Scientific 2013

32. (with L. Guo and B. Zhang) *Conical zeta values and their double subdivision relations*, Adv. in Math. **252** p. 343-381 (2014)

33. (with C. Lévy and C. Neira-Jimenez) *The canonical trace and the noncommutative residue on the noncommutative torus*, Trans. Amer. Math. Soc., **368**, N. 2, p. 1051–1095 (2016)

34. (with S. Azzali, C. Lévy, C. Neira-Jimenez) *Traces of holomorphic families of operators on the noncommutative torus and on Hilbert modules*, "Geometric Methods in Physics XXXIII Workshop 2014", Trends in Mathematics, Birkhäuser p. 3-38 (2016)

35. (with L. Guo and B. Zhang) *Algebraic Birkhoff Factorization and the Euler-Maclaurin formula on cones*, Duke Math. Journ. **166**, N.3 , p. 537-571 (2017)

36. (with L. Guo and B. Zhang) *Renormalised conical zeta values*, in "Resurgence, Physics and Numbers", Ed. F. Fauvet, D. Manchon, S. Marmi, D. Sauzin, Publ. Scuola Normale Sup., Vol. **20** p. 299-326 (2017)

37. (with P. Clavier, L. Guo and B. Zhang) *An algebraic formulation of the locality principle in renormalisation*, European Journ. Math., Volume **5**, Issue 2 p.356-394 (2018) arXiv:1711.00884

38. (with P. Clavier, L. Guo and B. Zhang)*Renormalisation via locality morphisms*, Rev. Colombiana de Matemáticas Vol. **53** p. 113-141 (2019)

39. (with P. Clavier, L. Guo and B. Zhang)*Renormalisation and locality: branched zeta values*, in "Algebraic Combinatorics, Resurgence, Moulds and Applications (Carma)" Vol. 2 ,Eds. F. Chapoton, F. Fauvet, C. Malvenuto, J.-Y. Thibon, Irma Lectures in Mathematics and Theoretical Physics **32**, European Math. Soc. 85–132 (2020)

40. (with P. Clavier, L. Guo and B. Zhang) *Locality and renormalisation: universal properties and integrals on trees*, Journ. Math. Phys. **61**, 022301 (2020) (https://doi.org/10.1063/1.5116381)

41. (with S. Azzali) *Spectral ζ-invariants lifted to coverings*, Trans. Amer. Math. Soc. 373 (2020) 6185-6226

42. (with L. Guo and B. Zhang) *A conical approach to Laurent expansions for multivariate meromorphic germs with linear poles*, Pacific Journ. Math. Vol. 307 (2020) 159–196

43. (with L. Guo, P. Clavier and B. Zhang) *From Orthocomplementations to Locality*, Symmetry, Integrability and Geometry: Methods and Applications SIGMA 17 (2021) (23 pages) https://www.emis.de/journals/SIGMA/Landi.html

44. (with P. Clavier and L.Foissy) *From non-unitary wheeled PROPs to smooth amplitudes and generalised convolutions*, European Journal of Mathematics, Vol. 8 (2022) 393-410

45. (with C. Bellingeri, P. Friz, and R. Preiss) *Smooth rough paths, their geometry and algebraic renormalization*, Vietnam Journ. of Math. Vol. 50, 719- 761 (2022). https://doi.org/10.1007/s10 022-00570-7

46. (with L. Guo and B. Zhang) *Mathematical Reflections on Locality* (online survey article), Jahresbericht der Deutschen Math. Vereinigung (2023) https://doi.org/10.1365/s13291-023-00268-w

47. (with A. Garmendia) *Principal bundle groupoids, their gauge group and their nerve*, Journ. of Geom. and Phys. Vol. 191 (2023)

48. (with G. Habib) *A pseudodifferential analytic perspective of Getzler's rescaling*, SIGMA 20 (2024), 010, 34 pages

49. (with R. Dahmen and A. Schmeding) *A topological splitting of the space of meromorphic germs in several variables and continuous evaluators* (to appear in Complex Analysis and its Synergies)

50. (with L.Guo and B. Zhang) *Locality Galois groups of meromorphic germs in several variables* (to appear in Communications in Mathematical Physics)

Book chapters

1. *Functional analysis*, Encyclopedia of Mathematical Physics, J.-P. Françoise, G. Naber, Tsou Sheung Tsun, Elsevier (2006) p. 88-96

2. *Differential geometry*, Encyclopedia of Mathematical Physics, J.-P. Françoise, G. Naber, Tsou Sheung Tsun, Elsevier (2006) p. 33-40

Published lecture notes

1. *Renormalized traces as a geometric tool* in **Geometric and Topological Methods for Quantum Field Theory**, Lecture notes of a course delivered at the 1999 Villa de Leyva summer school in Colombia, World Scientific 2001

2. *Divergent multiple sums and integrals with constraints: a comparative study*, in **Noncommutative geometry and physics: renormalisation, motives, index theory** (Ed. A. Carey) Lectures in Mathematics and Physics, European Mathematical Society p. 103-174 (2010)

3. *Paths towards an extension of Chern-Weil calculus to a class of infinite dimensional vector bundles* in **Geometric and Topological Methods for Quantum Field Theory**, Lecture notes of a course delivered at the 2009 Villa de Leyva summer school in Colombia, Cambridge University Press p.81-139 (2013)

Prepublication

1. (with L. Foissy, D. López and P. Clavier) *Tensor products and the Milnor-Moore theorem in the locality setup* (submitted)

Unpublished preprints

1. (with S. Rosenberg) *Chern-Weil constructions on ΨDO bundles*, 2002 (Center for Mathematical Physics BU-CMP/03-01)

2. (with Y. Maeda and D. Manchon) *Stokes' formulae on classical symbol valued forms and applications* math.DG/0510454 Preprint (2005)

3. *The noncommutative residue and the canonical trace in the light of Stokes and continuity properties*, Preprint arxiv:0706.2552 (2007)

4. *Discrete sums of classical symbols on $\mathbf{Z}^d$ and zeta functions associated with Lapalacians on tori*, arXiv:0708.0531v2 (revised version March 2008)

5. (with S. Azzali, Y. Boutaïb and A. Frabetti) *Direct connections on groupoids and their jet prolongations* (70 pages) (May 2022)

Unpublished lecture notes

1. *Prerequisites in differential geometry and operator theory in view of applications to quantum field theory* (Lecture Notes based on courses given at the University of Clermont-Ferrand in 1995-1996, 1997-1998, and lectures held at two summer schools in Villa de Leyva, Colombia 1999, 2001)
(http://matematicas.uniandes.edu.co/summer2009/ColombiaprerequisitesVdL03.pdf)

2. *From heat-operators to anomalies; a walk through various regularization techniques in mathematics and physics*, Emmy Nöther Lecture Notes (2003) (http://www.math.uni-goettingen.de)

3. *Two index theorems on forms* (Lecture Notes based on lectures delivered at a CIMPA summer school on "Index theory and interactions with quantum field theory" in Ouagadougou, Burkina Faso (2009) (http://ecolecimpa09.univ-ouaga.bf/))

Refereed conference proceedings (a selection)

1. *Bosonic strings and measures on infinite dimensional manifolds* in "Stochastics, Algebra and Analysis in Classical and Quantum Dynamics", p189-203, Kluwer Academic Publishers, 1990, ed. S.Albeverio and al.

2. (with S.Scarlatti) *Heat kernel regularized determinants on Riemann and super Riemann surfaces* Proceedings of a conference held in Ascona (1988) on "Stochastic processes, Physics and Geometry", published in World Scientific, ed. S.Albeverio, G.Casati, U.Cattaneo, D.Merlini and R.Moresi.

3. (with S.Albeverio and S.Scarlatti) *A short overview of mathematical approaches to functional integration* Proceedings of the XXV Karpacz Winter School of Theoretical Physics in "Functional integration, geometry and strings", Birkhäuser, 1989

4. *About infinite dimensional group actions and determinant bundles*, in "Analysis on Infinite-Dimensional Lie Groups and Algebras", (eds. H. Heyer, J. Marion) Singapore, World Scientific, 1998, 355-367.

5. *From group actions to determinant bundles (using (Heat-kernel) regularization techniques* in Infinite dimensional Kähler manifods, DMV Seminar Band 31, ed. A. Huckleberry, T. Wurzbacher, Birkhäuser 2001

6. *Zeta-regularized traces versus the Wodzicki residue as tools in quantum field theory and infinite dimensional geometry*, in "International conference on stochastic analysis and applications", Hammamet, Tunisia, 2001 (Kluwer Academic Press)

7. (with S. Rosenberg) *Traces and characteristic classes on loop spaces*, "Infinite dimensional groups and manifolds", Ed. T. Wurzbacher, IRMA Lectures in Mathematics and Theoretical Physics, Walter de Gruyter and Co. p.185-212 (2004)

8. (with L. Guo, B.-Y. Xie, B. Zhang) *Double shuffle relations and renormalization of multiple zeta values*, Proc. of the Conference on *Algebraic cycles* held at the Ohio State University in 2008, Clay Mathematics Proceedings, Vol. **12**, 2009

9. (with L. Guo and B. Zhang) *Renormalization by Birkhoff factorization and by generalized evaluators; a study case* in *Noncommutative Geometry, Arithmetic and Related Topics*, "The John Hopkins University Press" (2011)

10. *Noncommutative formal Taylor expansions and second quantised regularised traces*, Proceedings of the Conference on *Combinatorics and Physics* held in Bonn in Dec. 2006 and March 2007, Ed. K. Ebrahimi-Fard, M. Marcolli, W.D. van Suijlekom, Cont. Math. Amer. Math. Soc. Vol. **539** (2011) 349-376

Berlin, May 2022