

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*, Physics Letters B. **174** (1986)
2. *Mesures et déterminants en dimension infinie dans le modèle de Polyakov* , Comptes rendus Académie des Sciences, 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 Applicandae Mathematicae **26**, p.103-195 (1992)
4. *The Faddeev Popov procedure and application to bosonic strings: an infinite dimensional point of view*, Communications in Mathematical Physics **147**, p.163-180 (1992)
5. *Elliptic operators in the functional quantisation for gauge theories*, Communications in Mathematical Physics **166**, p.433-455 (1995)
6. (with M.Arnaudon) *Factorisation of semi-martingales on principal fibre bundles*, Stochastics and Stochastic Reports **53**, p.81-107 (1995)
7. (with M.Arnaudon) *Stochastic tools on Hilbert manifolds; Interplay with geometry and physics*, Communications in Mathematical Physics **187**, p.243-260 (1997)
8. (with M.Arnaudon) *Regularisable and minimal orbits for group actions in infinite dimensions*, Communications in Mathematical Physics **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 Probability and Related 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 Probability and Related Topics, Vol. **4** , N.2 p.221-266 (2001)

11. (with A. Cardona, C. Ducourtioux, J.P. Magnot) *Weighted traces on algebras of pseudodifferential operators and geometry on loop groups*, Infinite dimensional Analysis, Quantum Probability and Related Topics Vol. **5** n.4, p. 503-540 (2002)
12. (with A. Cardona, C. Ducourtioux) *From tracial anomalies to anomalies in quantum field theory*, Communications in Mathematical Physics **242**, p. 31–65 (2003)
13. (with S. Rosenberg) *First Chern forms and curvature on determinant bundles*, Journal of Geometry and Physics **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-Bavnbek, 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-Bavnbek, 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) *Laurent expansions for regularised integrals of holomorphic symbols* Geometric And Functional Analysis (2) **17** p. 491-536 (2007)
18. (with J.-M. Lescure) *Traces on pseudodifferential operators and associated determinants* Proceedings of the London Mathematical Society (2) **94** p. 772-812 (2007)
19. *(Second) quantised resolvents and regularised traces* Journal of Geometry and Physics **57** p. 1345-1369 (2007)
20. (with J. Mickelsson) *Renormalised Chern-Weil forms associated with families of Dirac operators* Journal of Geometry and Physics **57** p. 1789-1814 (2007)
21. *Renormalised multiple integrals of symbols with linear constraints* Comm. Math. Phys., p. 495-540 (2009)
22. (with D. Manchon) *Nested sums of symbols and renormalised multiple zeta values* International Mathematics 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*, Journal of the Australian Mathematical Society Volume **90**, N. 01, p. 53 - 80 (2011)
25. *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, American Mathematical Society (2011)

26. (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 University Press p. 183— 211 (2011)
27. (with M-F. Ouedraogo) *The multiplicative anomaly for determinants revisited; locality*, Comm. Math. Annal. **12** p. 28-63 (2012)
28. *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**, American Mathematical Society p. 199–222 (2012)
29. (with L. Guo and B. Zhang) *Conical zeta values and their double subdivision relations*, To appear in Advances in Mathematics.
30. **(submitted)** (with Cyril Lévy and Carolina Neira-Jimenez) *The canonical trace and the noncommutative residue on the noncommutative torus*

Book chapters

1. *Functional analysis*, Encyclopedia of Mathematical Physics, J.-P. Francoise, G. Naber, Tsou Sheung Tsun, Elsevier (2006) p. 88-96
2. *Differential geometry*, Encyclopedia of Mathematical Physics, J.-P. Francoise, G. Naber, Tsou Sheung Tsun, Elsevier (2006) p. 33-40

Published lecture notes

1. *Renormalized traces as a geometric tool in **Geometric 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*, Lecture notes of a course delivered at the 2009 Villa de Leyva summer school in Colombia, Cambridge University Press p.81-139 (2013)

Preprint to be submitted shortly

1. (with L. Guo and B. Zhang) *Renormalization of conical zeta values and the Euler-Maclaurin formula* (arXiv:1306.3420)

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 \mathbb{Z}^d and zeta functions associated with Laplacians on tori*, arXiv:0708.0531v2 (revised version March 2008)

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 manifolds, 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*, Proceedings 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, Contemporary Mathematics AMS vol. **539** (2011) 349-376

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