

Paolo Piazza
Curriculum Vitae et Studiorum
July 2008

Education:

- **Massachusetts Institute of Technology**, Cambridge MA (U.S.A.)
Ph.D. in Pure Mathematics. October 1986-May 1991.
Thesis advisor: Richard B. Melrose.
- **Università di Roma “La Sapienza”**, Rome, Italy.
Laurea in Pure Mathematics. November 1981-July 1985. Final grade : 110/110 Cum Laude.
Average : 30/30.

Academic Positions:

- From December 2003 to Present: Full Professor of Geometry in the Mathematics Department of *Università di Roma “La Sapienza”*.
- From November 1999 to December 2003: Associate Professor of Geometry in the Mathematics Department of *Università di Roma “La Sapienza”*.
- From July 1992 to October 1999: Researcher in Pure Mathematics in the Mathematics Department of *Università di Roma “La Sapienza”*.

Research Interests:

Noncommutative differential geometry. K-Theory. Topological and geometric invariants of elliptic operators. Differential geometry. Microlocal analysis.

Academic activities

- Will organize in 2010, with Jochen Brüning and Rafe Mazzeo, the Oberwolfach meeting ”Analysis and Geometric Singularities”
- Organizer (with Moulay Benameur, Eric Leichtnam and Bertrand Monthubert) of the Workshop ”Geometric applications of microlocal analysis”. CIRM, Luminy, June 2008.
- Organizer (with Paul Baum, Richard Melrose and Thomas Schick) of the International Conference *Topology and Analysis in Interaction*, Cortona, June 2008.
- Organizer (with Jochen Brüning and Rafe Mazzeo) of the Oberwolfach meetings ”Analysis and Geometric Singularities”. August 2005 and August 2007.
- Organizer (with Thomas Schick) of the special session *Dirac Operators in Topology and Geometry*; UMI-AMS joint meeting, Perugia, June 2007.
- Organizer (with Arbarello, De Concini, Manetti, O’Grady, Procesi, Salvati) of the special trimester at Rome 1 on *Moduli Spaces, Lie Theory, Interactions with Physics*.
- Organizer of several CNR-CNRS bilateral research projects (years 1996-2005).
- Founder and organizer (with O’Grady and then also with De Concini) of the *Geometry Seminar* in Rome 1: from 1995 to 2003.

- Member of the scientific committee of G.N.S.A.G.A. (Italian National Group for Algebra and Geometry).
- Referee for: *Acta Mathematica*, *Journal of Differential Geometry*, *Duke Mathematical Journal*, *Journal of Functional Analysis*, *Comptes Rendus Académie des Sciences (Paris)*, *Mathematical Research Letters*, *Rendiconti Accademia dei Lincei*, *Bulletin des Sciences Mathématiques*, *Journal für die Reine und Angewandte Mathematik (Crelle Journal)*, *Documenta Mathematica*. *Mathematische Annalen*, *Proceedings AMS*, *Proceedings of the London Mathematical Society*, *Journal of K-Theory*, *International Mathematics Research Notices*, *Journal of noncommutative geometry*.
- Former member of the editorial board of *Journal of Functional Analysis*.

Visiting positions at the following institutions:

- Université de Metz, Metz, France.
- Institut de Mathématiques de Jussieu, Paris.
- Institut Henri Poincaré, Paris.
- Chern Mathematical Institute, Tianjin, China.
- Stanford University, USA.
- Keio University, Japan.
- Erwin Schrödinger International Institute for Mathematical Physics, Vienna.
- Mathematical Sciences Research Institute, Berkeley.
- Tata Institute for Fundamental Research, Bangalore, India.
- École Normale Supérieure (ENS), Paris.
- Institut des Hautes Etudes Scientifiques (IHES), Bur sur Yvette.
- Université de Paris-Sud, Orsay.

Financial support for these visits was provided by: *Keio University*, *University of Paris 6, 7*, *Ville de Paris*, *Nankai Institute*, *ENS*, *IHES*, *Consiglio Nazionale delle Ricerche (CNR)*, *Centre Nationale de la Recherche Scientifique (CNRS)*, *Istituto Nazionale di Alta Matematica*, *Ministero dell'Università e della Ricerca Scientifica e Tecnologica (MURST)*, *MSRI*. *Université de Metz*, *European Union (under a Marie Curie Research Fellowship)*.

Recent talks:

- CIRM, Luminy, June 2008. Workshop *Geometric applications of microlocal analysis*.
- Institute de Mathématiques de Jussieu, May 2008. Within the *Séminaire d'Algèbres d'Opérateurs* organized by Georges Skandalis and Andrej Zuk.
- Humboldt-Universität zu Berlin. Germany. November 2007. *Geometric Analysis and Spectral Theory*,
A Conference in honor of the 60th Birthday of Jochen Brüning.
- Università di Ancona, Italy. September 2007. *Geometry and Operator Theory*, A Conference in honor of the 65th Birthday of Nicola Teleman.

- Oberwolfach Institute, Germany. September 2007. Workshop in *Noncommutative Geometry*.
- Warsaw University, Poland. July 2007. *Noncommutative Geometry and Quantum Groups*. Special session in the joint AMS-PTM meeting.
- Keio University, Tokyo, Japan. April 2007. Pathways Lecture Series in Mathematics.
- Chern Institute of Mathematics, Tianjin, China. April 2007. International Conference in *Geometry and Analysis on Manifolds*
- Hong Kong University. March 2007. Joint Hong Kong Geometry Colloquium.
- Institut Henri Poincaré, Paris, France. February 2007. International Conference *Groupoids in operator algebras and noncommutative geometry*
- Moscow State University, Russia. January 2007. International Conference *Operator Algebras and Topology*
- Oldenburg University (Germany). August 2006. International Conference *Spectral Theory and Global Analysis*.
- Université de Nantes (France). June 2006. In the *EMS Mathematical Weekend; Special Session in Global Analysis*.
- Ecole Polytechnique, Palaiseau (France), June 2006. In the *Séminaire de Géométrie Différentielle "A. Besse"* organized by Paul Gaudouchon.
- CIRM, Marseille (France), March 2006. Minicourse at the conference *Théorie(s) de l'indice*.
- Beijing Normal University, Beijing (China), July 2005. *Colloquium*.
- Nankai University, Tianjin (China). July 2005. *Colloquium*.
- Fudan University, Shanghai (China). July 2005. *Colloquium*.
- Mainz, Germany. June 2005. In the special session *Geometric Analysis* of the *joint meeting OMG-DMV-AMS*.
- Stanford University, USA. May 2005. In the Geometry Seminar organized by Rafe Mazzeo.
- University of California Santa Barbara, USA. May 2005. *Colloquium*.
- Oberwolfach, Mathematisches Forschungsinstitut, Germany. September 2004. In the workshop *Noncommutative Geometry*.
- Institut Henri Poincaré, Paris. July 2004. In the conference *K-Theory and noncommutative geometry*.
- Munich, Germany. March 2004. In the conference *Positive scalar curvature and related topics*.
- Durham, England. January 2004. In the *UK-Japan Winter School in Mathematics: Geometry and Analysis Toward Quantum Physics*
- Lisbona, Portugal. September 2003. In the *Mathematical Weekend* organized by the *European Mathematical Society*.
- Kyoto University, Japan. September 2003. Colloquium at the Department of Mathematics
- Keio University, Japan. August 2003. Colloquium at the Department of Mathematics

- Roskilde University, Denmark. August 2003. In the workshop *Spectral geometry of manifolds with boundary and decomposition of manifolds*.
- Università di Bologna, June 2003. A series of lectures in the Workshop *Analytical and Arithmetical Features in Noncommutative Geometry*.
- Collège de France, Aprile 2003. Within the *Séminaire d'Algèbres d'Opérateurs* organized by Alain Connes and Georges Skandalis.
- Vienna, E. Schrödinger International Institute for Mathematical Physics, September 2002.
- Napoli, Istituto Italiano per gli Studi Filosofici, June 2002. In the conference *Current Geometry*.

Publications:

1. Automorphisms of Extended Current Algebras, (with Siye Wu), *Proceedings of the American Mathematical Society*, **106**, (1989).
2. Analytic K-Theory on Manifolds with Corners, (with R. Melrose), *Advances in Mathematics*, **92**, (1992).
3. K-Theory and Index Theory on Manifolds with Boundary, M.I.T. Ph.D. Thesis.
4. On the index of elliptic operators on manifolds with boundary, *Journal of Functional Analysis*, **92**, (1993).
5. Families of Dirac operators, boundaries and the b -calculus (with R. Melrose), *Journal of Differential Geometry*, **146** n. 1 (1997). ¹.
6. An index theorem for families of Dirac operators on odd-dimensional manifolds with boundary, (with R. Melrose), *Journal of Differential Geometry*, **146** n. 2 (1997).
7. Determinant bundles, manifolds with boundary and surgery, *Communications in Mathematical Physics* **178** (1996).
8. The b -pseudodifferential calculus on Galois coverings and a higher Atiyah-Patodi-Singer index theorem (with E. Leichtnam, *Mémoires de la Société Mathématique de France*, n. 68 (1997) ².
9. Higher Atiyah-Patodi-Singer index theory (with E. Leichtnam), *C. R. Acad. Sci. Paris*, **325**, Ser I (1997).
10. Spectral sections and higher Atiyah-Patodi-Singer index theory (with E. Leichtnam), *Geometric and Functional Analysis (GAFA)*, **8** (1998).
11. Dirac operators, heat kernels and microlocal analysis. Part I: Family index theory, *Rendiconti del Circolo Matematico di Palermo, Supplemento, Serie II*, **49**, 1997.
12. Dirac operators, heat kernels and microlocal analysis. Part II: Analytic surgery (with R. Mazzeo), *Rendiconti di Matematica e delle sue applicazioni (Roma)*, **18** (1998).
13. Determinant bundles, manifolds with boundary and surgery II. Spectral sections and surgery rules for anomalies, *Communications in Mathematical Physics*, **193** (1998).

¹This article has obtained a *Featured Review* in the issue **99a** of *Mathematical Reviews of the AMS*.

²This article has obtained a *Featured Review* in the issue **99d** of *Mathematical Reviews of the AMS*.

14. Higher eta invariants and the Novikov conjecture on manifolds with boundary (with E. Leichtnam), *C. R. Acad. Sci. Paris t. 327 Serie I* (1998).
15. Homotopy invariance of twisted higher signatures on manifolds with boundary (with E. Leichtnam), *Bulletin de la Société Mathématique de France*, **127** (1999).
16. A higher Atiyah-Patodi-Singer index theorem for the signature operator on Galois coverings (with E. Leichtnam), *Annals of Global Analysis and Geometry*, **19** (1999).
17. On the homotopy invariance of higher signatures for manifolds with boundary (with E. Leichtnam and J. Lott), *Journal of Differential Geometry*, **54** (2000).
18. On higher eta invariants and metrics of positive scalar curvature (with E. Leichtnam). *K-Theory*, **24** (2001), pp 341-359.
19. Dirac index classes and the noncommutative spectral flow (with E. Leichtnam). *Journal of Functional Analysis*. **200** (2003), 348-400.
20. Groupoids étale, eta invariants and index theory (with E. Leichtnam). *Journal für die Reine und Angewandte Mathematik*. Vol 587 (2005) pp. 169 - 233
21. Elliptic operators and higher signatures (con E. Leichtnam), *Annales de l'Institut Fourier*. vol. 54 pp. 1197-1277
22. Cut-and-paste on foliated bundles (with E. Leichtnam), in “Spectral geometry of manifolds with boundary and decomposition of manifolds”, 151–192, *Contemp. Mathem.* Amer. Math. Soc., Providence, RI.
23. The index of Dirac operators on manifolds with fibered boundary (with E. Leichtnam e R. Mazzeo). *Bulletin of the Belgian Mathematical Society. Vol. 13 (2006)* (Proceedings of the Joint BeNeLuxFra Conference in Mathematics, Ghent, 2005.)
24. Bordism, rho-invariants and the Baum-Connes conjecture (with Thomas Schick). *Journal of Noncommutative Geometry*, 2007, Vol 1, pp 27-111.
25. Group with torsion, bordism and rho-invariants (with Thomas Schick). *Pacific Journal of Mathematics*, **232** (2007), pp 355-380.
26. Index, eta and rho invariants on foliated bundles (with Moulay Benameur). Preprint March 2008,

Work in Progress/Research Projects.

27. The Godbillon-Vey eta cocycle. Work in progress with Hitoshi Moriooshi.
28. Index classes and higher signatures on Witt spaces. Work in progress with Pierre Albin, Eric Leichtnam and Rafe Mazzeo.
29. Algebraic Surgery and the rho-invariant. Research project with Thomas Schick.
30. Adiabatic limits of higher eta invariants and applications. Research project with Eric Leichtnam.

Rome, July 21st 2008.