CURRICULUM VITAE
August 21, 2014

Pierre MARTINETTI

Education

2009: Habilitation à diriger les recherches en mathématiques (obtained 20.11.2009).
Title: *Géométrie non commutative et applications à la physique quantique.*
Département de mathématiques, université de Ht-Alsace, local contact: M. Bordemann.

1998-01: Ph.D. mathematical physics (obtained 1.10.2001).
Title: *Distances en géométrie non commutative.*
CPT Marseille & université de Provence, supervisor: B. Iochum.

1997-98: postgraduate diploma, *DEA physique mathématique* - CPT Marseille.

1993-97: undergraduate studies of physics - école normale supérieure Lyon & université Lyon 1.

1993-95: undergaduate studies of philosophy - université Lyon 3.

1992-93: classe préparatoire (hypokhâgne BL) - lycée du Parc, Lyon.

Work experience

positions

2012-14: dpt. di fisica, università di Napoli *Federico II* - assistant researcher.

2010-12: dpt. matematica, università Roma *Tor Vergata* & CMTP (R. Longo's ERC advanced grant) & dpt. fisica, università Roma *Sapienza* (M. Curie reintegration grant) - assistant researcher.

2008-10: Institut für Theoretische Physik, Universität Göttingen - assistant professor.

2005-07: dpt di fisica, università di Roma *Sapienza* - Marie Curie intra-european fellowship.

2003-04: dpt de Matemática, Instituto Superior Técnico, Lisboa - eu-network *geometric analysis*.

2001-02: CPT & université de Provence - assistant professor.

invited stays

2010-11: *chercheur invité* at LPT Orsay (three months).

july 2007: visiting Max Planck Institute for Mathematics, Bonn.

sept 2003: visiting Perimeter Institute for theoretical physics, Waterloo, Canada.

sept 2002 - april 2003 : visiting université d'Oujda, Morocco, fellowship "agence de la francophonie".

Teaching

(the indicated periods correspond to academic years)

2011-12: assistant professor in *statistics for biology* (36h), università di Roma *Tor Vergata*.

2009-10: oberassistant *mathematical technics for physics* (42h), Universität Göttingen.

2008-09: advanced lectures *Noncommutative geometry* (42h),
oberassistant *thermodynamics & statistical physics* (42h), Universität Göttingen.

2007-08: oberassistant *quantum mechanics* (42h), Universität Göttingen.

2006-07: co-supervision of two student's graduating thesis ("laurea"):
Simmetria di Noether in 0-Minkovski and *Simmetria di Noether in κ-Minkovski*;
partly encharged of the advanced course *introduzione alla gravità quantistica* (20h)
with G. Amelino-Camelia, università di Roma *Sapienza*.

2005-06: partly encharged of the advanced course *introduzione alla gravità quantistica*
with G. Amelino-Camelia (20 hours/year), università di Roma *Sapienza*.

2004-05: assistant professor in *descriptive geometry* with M. Frégier (120h/year),
école supérieure d'architecture de Marseille Luminy.

2002-03: advanced course *introduction à la géométrie non commutative et ses applications à la physique* (20h), university Mohammed 1, Oujda Maroc.

2001-02: assistant professor in *mechanics* and *fortran programming*, supervision of three undergraduate research projects (ATER: 96h), université de Provence.

1998-01: teaching assistant in *mathematics*, *special relativity*, *quantum mechanics* and *electromagnetism* with T. Schücker (monitorat: 64h/year), université de Provence.

students

co-supervision with F. Lizzi (Napoli *Federico II*): Ph.D thesis of Agostino Devastato, 2011-.

co-supervision with G. Amelino-Camelia (Roma *Sapienza*):

-Ph.D thesis of Flavio Mercati, 2007-10:
Aspects of quantum symmetries in noncommutative spacetimes.

-graduating thesis ("tesi di laurea") 2006-07:
Giulia Gubitosi, *Simmetria di Noether in 0-Minkovski*;
Flavio Mercati, *Simmetria di Noether in κ-Minkovski*.

supervision of three undergraduate research projects (université de Provence) 2001-02:
black holes, gamma ray burst, gravitational lensing.

other teaching responsabilities

members of the PhD commissions of

- June 2012 (also referee) : E. Cagnache,
Aspects différentiels et métriques de la géométrie non-commutative. Application à la physique.
laboratoire de physique théorique, université Paris-XI Orsay.
- July 2011: N. Franco, *Lorentzian approach to noncommutative geometry*,
département de mathématique, université de Namur.

Administration & responsablities

Member of two PhD commissions, and referee for one of them (see "teaching" section).

Evaluating expert for FNRS (Belgium).

Co-organizer:

- workshop *Noncommutative geometry and optimal transport*, Besançon, november 2014;
- conference *Algebraic QFT - the first 50 years*, Göttingen, july 2009;
- 25th workshop on QFT, Göttingen, january 2010;
- 23rd workshop on QFT, Göttingen, january 2009;
- workshop *Geometry in Lisbon*, IST Lisbon, january 2004.

Referee for J. of Math. Phys., J. of Geometry and Physics, Foundations of Physics, Classical & quantum gravity, Intl. Journal of modern Physics, SIGMA. Several reviews written for MathSciNet. Member of *société mathématique de France, Intl. Assoc. of Math. Physics, European Phys. Society.*

Distinctions and previous financial supports

- Ranked 4th for a permanent position (professeur) in mathematics in May 2010 and 2013 (Metz), May 2011 (Dijon, Metz). Ranked 3rd for a professeur position in physics in May 2013 (Corte). Ranked 2nd for a permanent position (maître de conférence) in mathematics in April 2005 (Caen) and May 2007 (Metz); and in math.-physics in May 2009 (university Paris-11 Orsay).
- Qualified in section 25 (mathematics) and 29 (theoretical physics) at French CNU for professeur and maître de conférence.
- Italian Abilitazione Scientifica Nazionale in section 01/A2 (geometry and algebra) and 01/A4 (mathematical physics) for professor.
- 36 months Marie-Curie European Reintegration Grant, 2009-2012.
- 24 months Marie-Curie Intra European Fellowship, 2006-2007.
- 10 months Bourse bilatérale Etudes et Recherche, program égide, 2005-2006.
- 15 months of postdoctorate from the european network *geometric analysis*, 2003- 2004.
- 6 months of postdoctorate from the agence française de la francophonie, 2002-2003.

Divulgation

- talk at working group *philosophie et physique*, Rehseis (ENS & University Paris 7) february 2010, organised by A. Afriat, A. de Saint-Ours, E. During.
- interviewed for an article on New Scientist about the thermal time hypothesis http://www.newscientist.com/article/mg19726391.500-is-time-an-illusion.html?full=true

Others

Computers: Mathematica, Maple, notions in C++, fortan-90 and 77, creation of webpages.

Languages: french, english, italian (fluent), good notions of portuguese and german.

Present and past collaborations

Michel Dubois-Violette (Orsay, *michel.dubois-violette@u-psud.fr*),

Roberto Longo (Roma Tor Vergata, *longo@mat.uniroma2.it*),

* Karl-Henning Rehren (Göttingen, *rehren@physik.uni-goe.de*):
modular group in conformal field theory.

Francesco D'Andrea (Napoli, *francesco.dandrea@unina.it*),

Fedele Lizzi (Napoli, *fedele.lizzi@na.infn.it*),

Luca Tomassini (Roma, *tomassini@sci.unich.it*),

Patrizia Vitale (Napoli, *vitale@na.infn.it*),

Jean-Christophe Wallet (Orsay, *Jean-Christophe.Wallet@th.u-psud.fr*):
metric aspect of noncommutative geometry,
standard model of particle physics in noncommutative geometry,
renormalization of gauge theory on noncommutative space.

Carlo Rovelli (CPT Marseille, *rovelli@cpt.univ-mrs.fr*):
physical interpretation of the modular group, thermal time hypothesis.

* Giovanni Amelino Camelia (La Sapienza Roma, *amelino@roma1.infn.it*):
Noether symmetries for quantum groups.

Thomas Krajewski (CPT Marseille, *Thomas.Krajewski@cpt.univ-mrs.fr*):
exact non perturbative renormalization and Hopf algebras.

Raimar Wulkenhaar (Münster, *raimar@math.uni-muenster.de*):
metric aspect of the standard model in noncommutative geometry.

Paolo Almeida (IST Lisboa, *palmeida@math.ist.utl.pt*): on the Connes-Marcolli work (from number theory to statistical physics via noncommutative geometry).

Hassan Tahri (LPTPP Oujda, *hassanfa@yahoo.com*):
spectral distance in Podles sphere.

Other contacts (people who know me and my work and can be contacted as referees)

Paris: Alain Connes, *alain@connes.org*.

Berkeley: Marc Rieffel, *rieffel@math.berkeley.edu*.

Göttingen: * Detlev Buchholz, *buchholz@theorie.physik.uni-goettingen.de*.

Mulhouse: Martin Bordemann (Habilitation advisor), *Martin.Bordemann@uha.fr*.

Zaragoza: Jose M. Gracia-Bondia, *jmgb@unizar.es*.

Marseille: * Bruno Iochum, *iochum@cpt.univ-mrs.fr*.
* Thomas Schücker, *thomas.schucker@gmail.com*.

Lisboa: Aleksandar Mikovic, *aleksander.mikovic@ulusofona.pt*.

*People with an asterix can also be contacted as referee for my teaching activity, as well as Gianpaolo Scalia Tomba, *scaliato@mat.uniroma2.it*, for the lectures in statistics for biology.

Talks

conferences as a plenary speaker

Higgs mass in noncommutative geometry,
Algebraic quantum field theory: its status and its future, ESI Wien 05/14.

Noncommutative geometry and physics,
Spectral geometry with a cut-off,
Arbre de Noël du GDR "géométrie non-commutative", Caen 12/13.

Pythagoras theorem in Noncommutative Geometry,
Quantum geometry and matter, SISSA Trieste 04/13.

Kantorovich metric in Noncommutative Geometry,
Quantum Probabilities 33, CIRM Luminy, 10/12;
"Monge-Kantorovich optimal transportation problem, transport metrics and their applications" int. conference in honor of the centenary of Kantorovich, St. Petersburg, 6/12.

Metric aspect of quantum space: minimal length, Pythagoras theorem, Higgs field,
Workshop "New trends in algebraic quantum field theory", Frascati 09/12.

Gauge fluctuation in Noncommutative Geometry and Carnot-Carathéodory distance,
ERC workshop "Geometric Analysis and sub-Riemannian and Metric Spaces", Pisa 10/11.

Noncommutative Geometry with applications to quantum physics,
2nd winter workshop "Non Perturbative Quantum Field Theory", INLN, Nice 10/11.

Minimal length in quantum space and integrations of the line element in noncommutative geometry,
Easter quantum gravity workshop, Roma 04/12;
Planckland, SISSA 02/12.

The metric aspect of noncommutative geometry,
EINSTEIN at SISSA, Trieste 07/10.

The harmonic oscillator as a quantum standard meter,
Workshop quantum gravity, Roma 05/10.

A view on optimal transport from noncommutative geometry,
Journées franco-italiennes de géométrie non-commutative, Besançon 02/11;
Workshop NCG: topics in mathematics and mathematical physics, LPT Orsay 11/09.

Spectral distance in the Moyal plane,
Workshop groupes quantiques et géométrie non-commutative, CIRM Marseille 09/10;
Workshop on Algebraic Geometry and Physics, St Jean de Monts 05/10;
2nd annual meeting of the ncg network, København 10/09.

Temperature for double-cone in 2D CFT from modular theory,
24th qft workshop, universität Leipzig 06/09.

Line element in noncommutative geometry,
The Planck scale, 25th Max Born symposium, Wroclaw 07/09.

The standard model from the metric point of view,
2nd workshop noncommutative geometry & quantum gravity, Lisboa 09/08;
First annual meeting of ncg network, Dublin 06/08.

Metric interpretation of gauge fields in noncommutative geometry,
4th central european seminar on particle physics and qft, Vienna 11/07.

Unruh/Hawking temperature and the thermal time hypothesis,
4th Agean summer school: black holes, Mytilene (Greece) 09/2007.

Algebraic structure of renormalization, ERG 06, Lefkada (Greece) 09/06.

Is life a thermal horizon ?, DICE 06, Piombino (Italy) 09/06.

Noncommutative geometry, Noncommutative spaces,
Workshop phenomenology of Planck scale physics, Roma 06/06.

Thermal time hypothesis: overview and application,
NEB XII: recent developments in gravity, Nafplio (Greece) 06/06.

Smoother than a circle: a metric interpretation of gauge field from noncommutative geometry,
International meeting on differential geometry, Deva (Romania) 09/05;
Oporto's meeting on geometry and physics, Porto 07/05;
International conference on high energy and math. physics, Marrakech 04/05.

Time interpretation of von Neumann algebra automorphisms,
Workshop noncommutative manifold, ICTP, Trieste 10/04.

What kind of noncommutative geometry for quantum gravity ?
Workshop noncommutative geo. & quantum gravity, universidade Lusofona, Lisboa 07/04.

Physical introduction to Dirac operator, Workshop geometry in Lisbon 01/04.

La distance en géométrie non commutative et le champ de Higgs, GDR 2001 Marseille.

Modèle standard en géométrie non commutative, Rencontres jeunes chercheurs, Aussois 12/2000.

conferences as a contributed talks

Spectral geometry with a cut-off,
Frontiers of fundamental physics 14, Marseille 07/14;
1st italo-spanish meeting of mathematics, Bilbao 07/14.

Grand symmetry, spectral action, and the Higgs mass,
Workshop on noncommutative field theory and gravity, Corfou 09/13.

Minimal length in quantum space and integrations of the line element in noncommutative geometry,
Workshop "Modern trends in algebraic quantum field theory", Pavia 09/11;
11th Hellenic workshop on elementary particles physics and gravity, Corfou 09/11;
Workshop "Harmonic analysis, quantization and noncommutative geometry", Scalea 09/11.

Noether symmetry on noncommutative spacetime,
Workshop "Quantum groups and physics", Caen 09/10.

Emergence of time in quantum gravity: is there more light at noon or midnight ?
Workshop "Temps & émergence", Ecole Normale Supérieure, Paris 10/11;
Workshop "Math., phys. and conceptual aspects of quantum gravity", APC univ. Paris 7, 03/11.

Geometrical modular action for disjoint intervals and boundary conformal theory,
Workshop "Noncommutativity and Physics", Bayrischzell 05/10;
Deutschen Physikalischen Gesellschaft Frühjarstagun, Bonn 03/10.

Spectral distance in the Moyal plane,
Deutschen Physikalischen Gesellschaft Frühjarstagun, Bonn 03/10.

Temperature for double-cone in 2D CFT from modular theory,
Conf. in honor of J. Roberts, Vietri sul Mare 09/09.

Noncommutative geometry and its application to the standard model,
Deutschen Physikalischen Gesellschaft Frühjarstagun, München 03/09.

The standard model from the metric point of view,
NoMaP, Bruxelles 07/08;
22nd qft workshop, DESY Hamburg, 06/08;
School"new paths towards quantum gravity", Holbaek (Denmark) 05/08.

Spectral distance on the circle,
Workshop on noncommutative manifolds II, ICTP, Trieste 10/07;
British Mathematical Council, Swansea 04/07;
Worshop noncommutative spacetime geometries, Alessandria (Italy) 03/07.

Distance in noncommutative geometry, Workshop ncg & the structure of spacetime,
Isaac Newton Institute, Cambridge 09/06.

Thermal time hypothesis: overview and application,
Loops 05, Potsdam 10/05.

What kind of noncommutative geometry for quantum gravity ?
40th winter school on theoretical physics, Ladek Zdrój (Poland) 02/04.

invited talks (invited by)

Higgs mass in noncommutative geometry,
LAPTh Annecy 03/14 (Bjorn Hermann) Université de Louvain-la-Neuve 12/13 (P. Bieliavsky);
LPT Orsay, Paris-sud 10/13 (J.-C. Wallet);
Centre de physique théorique, Marseille 10/13 (C. Duval).

Spectral geometry with a cut-off,
University of Nijmegen 12/13 (van Suijlekom);
Université de Louvain-la-Neuve 12/13 (P. Bieliavsky).

Géométrie non-commutative et distance de Monge-Kantorovich: l'exemple du plan de Moyal,
Département de mathématiques, université d'Angers, 04/13 (V. Rubstov) ;
C^*-académic, université d'Orléans 03/13 (J. Renault);
Institut Camille Jordan, Lyon 02/13 (F. Vignes-Tourneret);
Département de mathématiques, université de Lorraine, Metz 01/13 (H. Oyono) ;
Institut für Mathematik, Göttingen 11/12 (K.-H. Rehren);
Institut de mathématique de Jussieu, Paris11/12 (G. Skandalis).

The metric aspect of noncommutative geometry: from the Monge problem to the Higgs field,
Università di Napoli *Federico II*, 02/12.

On Pythagoras theorem in noncommutative geometry,
LATP, Marseille 04/12;
Département de mathématiques de Besançon 03/12 (U. Franz).

Minimal length in quantum spacetime & integration of the line element in NCG,
DESY, Hambourg, 5/12 (K. Fredenhagen);
Centre de physique théorique, Marseille 03/12 (C. Duval);
SISSA, Trieste 11/11 (L. Dabrowski);
Département de mathématiques, université Metz 03/11 (S. Mehdi).

Distances en GNC: du transport optimal au plan de Moyal en passant par la géo. sous-riemanienne,
Institut Camille Jordan, Lyon 05/11 (D. Perrot);
Département de mathématiques, université de Bourgogne, Dijon 04/11 (C. Klein).

Von-Neumann algebra in physics by examples,
Séminaire de logique, LIPN Paris-nord 03/11 (D. Mazza).

Spectral distance in the Moyal plane,
Born-Hilbert seminar, Universität Göttingen 04/10 (K. H. Rehren).

Action géométrique du groupe modulaire en théorie conforme des champs avec bord,
Equipe CALIN, LIPN Paris-nord 02/11 (G. H. E. Duchamp);
CPT Marseille 10/10 (C. Rovelli);
Institut Camille Jordan, Lyon 04/10 (D. Perrot);
LPT Orsay, Paris-sud 03/10 (J.-C. Wallet);
Département de mathématiques, université Metz, 03/10 (J.-L. Tu).

L'hypothèse du temps thermodynamique,
REHSEIS, université Denis Diderot & ENS, Paris 02/10 (A. de Saint Ours).

L'aspect métrique de la géométrie non-commutative,
Equipe CALIN, LIPN Paris-nord 02/11 (G. H. E. Duchamp);
Département de mathématiques, Besançon 03/10 (E. Ricard);
Laboratoire de mathématiques, Clermont-Ferrand 02/10 (S. Paycha).

Noncommutative space and time,
LPT Orsay, Paris-sud 04/09 (J. C. Wallet);
Laboratoire physique théorique, Tours 03/09 (K. Noui).

Distances en géométrie non-commutative,
Institut de mathématiques de Jussieu, Paris 01/09 (Andrzej Zuk);
Département de mathématiques, Mulhouse 01/09 (M. Bordemann).

The standard model from the metric point of view,
Born-Hilbert seminar, universität Göttingen, 03/08 (K. H. Rehren).

L'élément de longeur en géométrie non-commutative,
Département de mathématiques, Mulhouse 04/08 (K. Ebrahimi-Fard);
Section de mathématiques, université de Genève 04/08 (P. de la Harpe).

Essai pour une analyse de Noether sur espaces non-commutatifs,
Laboratoire physique théorique, Tours 11/08 (K. Noui);
Laboratoire physique théorique, Paris-Orsay 12/07 (J. C. Wallet).

Algebraic Birkhoff decomposition for the continuous renormalization group,
Equipe CALIN, laboratoire d'informatique de Paris-Nord, 02/11 G. H. E. Duchamp);
Max Planck Intitut für Mathematik, Bonn 07/07 (K. Ebrahimi-Fard);
Université Mohammed 1, Oujda 02/04 (E. H. Tahri and T. Ouali).

Distance spectrale sur le cercle,
Département de mathématiques, université de Metz 02/07 (M. Benhamcur);
IML Marseille 01/07 (A. Wasserman).

Is life a thermal horizon ?
Laboratoire de physique théorique, université de Tours 01/07 (K. Noui);
School math. science, university of Nottingham 12/06 (J. Louko).

Distance de Carnot-Carathéodory et fluctuation de la métrique en géo. non comm.,
Universités de Metz. Rennes, Toulouse 04/06;
Université Lyon 1 04/05 (A. Frabetti);
Université de Caen 03/05 (L. Vainerman).

Unruh effect for bounded trajectories and the thermal time hypothesis.
Laboratoire d'Annecy de physique théorique, 01/05 (L. Gallot);
Perimeter Institute, Waterloo 10/03 (F. Girelli).

Distances in noncommutative geometry,
Universidade Lusofona, Lisboa 12/03 (A. Mikovic);
Sissa, Trieste 03/2002 (L. Dabrowski).

Neutrinos massifs et modèle standard en géométrie non commutative.
Institut des sciences nucléaires, Grenoble 03/2001 (D. Santos).