

# Curriculum Vitae

**GINOUX Nicolas**

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**Associated member** of the geometry group at *Institut Élie Cartan de Lorraine* (IECL) since 2015

**Personal data:** Born November 2<sup>nd</sup>, 1974 in Grenoble (France) / French / unmarried

## Employment:

- 09/2014- : *PRAG* [professeur agrégé, lecturer] in mathematics at the department for computer science, IUT (*Institut Universitaire de Technologie*) de Metz, Université de Lorraine, Metz, France
- 10/2008-08/2014: *Akademischer Rat auf Zeit* [lecturer] in Bernd Ammann's group at Universität Regensburg, Germany
- 10/2003-09/2008: Assistant in Christian Bär's group at Universität Potsdam, Germany
- 04/2003-10/2003: Postdoc in Christian Bär's group at Universität Hamburg, Germany
- 10/2002-03/2003: Postdoc at Max-Planck Institut für Mathematik in den Naturwissenschaften, Leipzig (joint research with Hans-Bert Rademacher and Florin Belgun), Germany
- 09/1999-08/2002: A.T.E.R. [assistant], Université Henri Poincaré (UHP), Nancy, France
- 09/1998-08/1999: Training teacher, Lycée Louis Lopicque, Epinal, France

## Visiting positions:

- Invited professor (one month), UHP, Nancy, 2009

## Education:

- 2011-2014: **Habilitation thesis** in mathematics, Universität Regensburg, Germany  
Subject: *Analysis on Kähler and Lorentzian manifolds*  
*Mentoren* [Mentors]: Bernd Ammann, Gilles Carron, Paul Gauduchon  
*Referees*: Helga Baum, Andrei Moroianu
- 1999-2002: **PhD thesis** in mathematics, UHP, Nancy  
Subject: *Dirac operators on submanifolds*  
Advisor: Oussama Hijazi  
Jury: Paul Gauduchon (Pres.), Helga Baum (Ref.), Sebastián Montiel (Ref.), Gérard Besson, Bruno Colbois, Oussama Hijazi.
- 1998-1999: *Diplôme d'Études Approfondies* (master degree) in mathematics, UHP, Nancy; Master thesis on *Hermitian geometry and conformal spin geometry*
- 1997-1998: *Agrégation* in mathematics (graduate degree based on a nationwide competitive exam giving access to teaching positions in secondary and university systems), Université Joseph Fourier, Grenoble, France

## Research:

- *Differential geometry*: geometry of submanifolds, of Kählerian, Riemannian and Lorentzian manifolds, of Riemannian foliations
- *Analysis on manifolds*: spectral geometry of Dirac-type operators, evolution equations
- *Mathematical physics*: quantum field theory

## Publications and preprints<sup>1</sup>:

### • Articles:

- [33] Nicolas Ginoux, Georges Habib and Simon Raulot, *A Poincaré formula for differential forms and applications*, SIGMA **19** (2023), 088, 17 pages
- [32] Nicolò Drago, Nicolas Ginoux and Simone Murro, *On the Cauchy problem for the Faraday tensor on globally hyperbolic manifolds with timelike boundary*, Atti Accad. Naz. Lincei Cl. Sci. Fis. Mat. Natur. **34** (2023), no. 4, 809–829

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<sup>1</sup>see [http://nicolas-ginoux.perso.math.cnrs.fr/ginoux\\_publis.pdf](http://nicolas-ginoux.perso.math.cnrs.fr/ginoux_publis.pdf) for a commented list

- [31] Nicolas Ginoux and Georges Habib, *A generalised Ricci-Hessian equation on Riemannian manifolds*, submitted
- [30] Fida El Chami, Nicolas Ginoux, Georges Habib and Ola Makhoul, *Biharmonic Steklov operator on differential forms*, submitted
- [29] Nicolò Drago, Nicolas Ginoux and Simone Murro, *Møller operators and Hadamard states for Dirac fields with MIT boundary conditions*, Documenta Math. **27** (2022), 1693–1737
- [28] Nicolas Ginoux and Simone Murro, *On the Cauchy problem for Friedrichs systems on globally hyperbolic manifolds with timelike boundary*, Adv. Differ. Equ. **27** (2022), no. 7-8, 497–542
- [27] Nicolas Ginoux, Georges Habib and Ines Kath, *Skew Killing spinors in four dimensions*, Ann. Global Anal. Geom. **59** (2021), no. 4, 501–535
- [26] Nicolas Ginoux, Georges Habib, Mihaela Pilca and Uwe Semmelmann, *An Obata-type characterisation of Calabi metrics on line bundles*, North-West. Eur. J. Math. **6** (2020), 119–136
- [25] Nicolas Ginoux, Georges Habib, Mihaela Pilca and Uwe Semmelmann, *An Obata-type characterization of doubly-warped product Kähler manifolds*, Münster J. Math. **14** (2021), no. 2, 295–321
- [24] Fida El Chami, Nicolas Ginoux and Georges Habib, *New eigenvalue estimates involving Bessel functions*, Publ. Mat. **65** (2021), 681–726
- [23] Bernd Ammann and Nicolas Ginoux, *Some examples of Dirac-harmonic maps*, Lett. Math. Phys. **109** (2019), no. 5, 1205–1218
- [22] Nicolas Ginoux, Georges Habib and Ines Kath, *A splitting theorem for Riemannian manifolds of generalised Ricci-Hessian type*, preprint
- [21] Matthias Becker, Nicolas Ginoux, Sébastien Martin and Zsuzsanna Róka, *Tire Noise Optimization Problem: a Mixed Integer Linear Program Approach*, RAIRO - Operations Research **55** (2021), no. 5, 3073–3085
- [20] Nicolas Ginoux and Olaf Müller, *Global solvability of massless Dirac-Maxwell systems*, Ann. Inst. H. Poincaré Anal. Non Linéaire **35** (2018), no. 6, 1645–1654
- [19] Fida El Chami, Nicolas Ginoux, Georges Habib and Roger Nakad, *Rigidity results for Riemannian spin<sup>c</sup> manifolds with foliated boundary*, Results in Math. **72** (2017), no. 4, 1773–1806
- [18] Fida El Chami, Nicolas Ginoux, Georges Habib and Roger Nakad, *Rigidity results for spin manifolds with foliated boundary*, J. Geom. **107** (2016), no. 3, 533–555
- [17] Nicolas Ginoux, *About the Lorentzian Yamabe problem*, Geom. Dedicata **174** (2015), 287–309
- [16] Nicolas Ginoux, Georges Habib and Simon Raulot, *A new upper bound for the Dirac operator on hypersurfaces*, Pacific J. Math. **278** (2015), no. 1, 79–101
- [15] Bernd Ammann and Nicolas Ginoux, *Dirac-harmonic maps from index theory*, Calc. Var. Part. Diff. Eq. **47** (2013), no. 3-4, 739–762
- [14] Christian Bär and Nicolas Ginoux, *Classical and quantum fields on Lorentzian manifolds*, in: C. Bär et al. (eds): “Global Differential Geometry”, Springer Proceedings in Mathematics **17** (2012), no. 2, 359–400
- [13] Nicolas Ginoux and Georges Habib, *The spectrum of the twisted Dirac operator on Kähler submanifolds of the complex projective space*, manuscripta math. **137** (2012), no. 1-2, 215–231
- [12] Nicolas Ginoux and Uwe Semmelmann, *Imaginary Kählerian Killing spinors I*, Ann. Glob. Anal. Geom. **40** (2011), no. 4, 467–495
- [11] Nicolas Ginoux and Jean-François Grosjean, *Almost harmonic spinors*, C. R. Math. Acad. Sci. Paris **348** (2010), no. 13-14, 811–814
- [10] Nicolas Ginoux and Georges Habib, *A spectral estimate for the Dirac operator on Riemannian flows*, Cent. Eur. J. Math. **8** (2010), no. 5, 950–965
- [9] Nicolas Ginoux and Georges Habib, *Remarques sur les spineurs de Killing transversaux*, C. R. Math. Acad. Sci. Paris **346** (2008), no. 11-12, 657–659

- [8] Nicolas Ginoux and Georges Habib, *Geometric aspects of transversal Killing spinors on Riemannian flows*, Abh. Math. Sem. Univ. Hamburg **78** (2008), 69–90
- [7] Nicolas Ginoux, *The spectrum of the Dirac operator on  $SU_2/Q_8$* , manuscripta math. **125** (2008), no. 3, 383–409
- [6] Florin Belgun, Nicolas Ginoux and Hans-Bert Rademacher, *A singularity theorem for twistor-spinors*, Ann. Inst. Fourier **57** (2007), no. 4, 1135–1159
- [5] Nicolas Ginoux, *Dirac operators on Lagrangian submanifolds*, J. Geom. Phys. **52** (2004), no. 4, 480–498
- [4] Nicolas Ginoux, *Remarques sur le spectre de l'opérateur de Dirac*, C. R. Acad. Sci. Paris Sér. I **337** (2003), no. 1, 53–56
- [3] Nicolas Ginoux, *Une nouvelle estimation extrinsèque du spectre de l'opérateur de Dirac*, C. R. Acad. Sci. Paris Sér. I **336** (2003), no. 10, 829–832
- [2] Nicolas Ginoux, *Reilly-type spinorial inequalities*, Math. Z. **241** (2002), no. 3, 513–525
- [1] Nicolas Ginoux and Bertrand Morel, *On eigenvalue estimates for the submanifold Dirac operator*, Int. J. Math. **13** (2002), no. 5, 533–548

• **Books:**

- [B2] Nicolas Ginoux, *The Dirac spectrum*, Lecture Notes in Mathematics **1976** (2009), Springer
- [B1] Christian Bär, Nicolas Ginoux and Frank Pfäffle, *Wave equations on Lorentzian manifolds and quantization*, ESI Lectures in Mathematics and Physics (2007), EMS Publishing House

• **Proceedings:**

- [P4] Matthias Becker, Nicolas Ginoux, Sébastien Martin and Zsuzsanna Róka, *Optimization of Tire Noise by Solving an Integer Linear Program (ILP)*, in: 2016 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2016), October 9-12, 2016, Budapest
- [P3] Christian Bär and Nicolas Ginoux, *CCR- versus CAR-quantization on curved spacetimes*, in: F. Finster et al. (eds.): “Quantum Field Theory and Gravity”, Birkhäuser, 183–206, 2012
- [P2] Nicolas Ginoux, *Linear wave equations*, in: C. Bär et K. Fredenhagen (eds.): “Quantum field theory on curved spacetimes”, Lecture Notes in Physics **786** (2009), 59–84, Springer
- [P1] Nicolas Ginoux, *Reilly-type spinorial inequalities*, in: J.-P. Bourguignon et al. (eds.): “Dirac operators: Yesterday and Today”, 263–269, International Press, 2005

**Recent talks, invitations and visits:**

- *Problèmes à bord pour les formes différentielles*, Tours, 19/01/2024
- Research in group with Fida El Chami, Ola Makhoul, Georges Habib and Simon Raulot in the framework of IEA HOPF, Rouen, 19-24/06/2023
- *CCR-representations of symplectic vector spaces*, Potsdam (online), 9/12/2022
- *New geometric eigenvalue estimates from Bessel functions*, EGE Geometry Day 4 (online), 15/06/2022
- *New geometric eigenvalue estimates from Bessel functions*, Regensburg (online), 14/06/2021
- *Nouvelles estimations de valeurs propres d'opérateurs géométriques et fonctions de Bessel*, Nantes, 21/02/2020

**Service:**

1. Organization of conferences and research in pairs:
  - “Journée rouennaise d’analyse géométrique”, Rouen, 20/06/2023

- “*Effect of the curvature operator on the boundary of a Riemannian manifold*” (Research in Pairs with Georges Habib and Simon Raulot), CIRM, 19-24/02/2023
  - “*Spectral geometry of Dirac operators*” (Research in Pairs with Georges Habib and Simon Raulot), MFO, 11-23/07/2022
  - “*Riemann and Kähler geometry*”, Bucharest, April 15-19, 2019
  - MATH.en.JEANS Spring Congress, Metz, April 21-23, 2016
  - “*Journées Nancéiennes de Géométrie 2016*”, Nancy, January 19-20, 2016
  - “*Spin geometry and analysis on manifolds*”, CIRM, October 6-10, 2014
  - “*Spectral geometry of the Dirac operator on hypersurfaces in spaceforms*” (Research in Pairs with Georges Habib), CIRM, 18/02-1/03/2013
2. Hiring committees: Universität Regensburg, 2009/10 (assistants’ representative)
  3. PhD committees: Christophe Desmots (Nancy, 2015)
  4. Reports for journals and various institutions
  5. Administration:
    - Member of the study evaluation committee at IUT de Metz, 2019-2022
    - Deputy of the *commission doctorale* (PhD committee) at IECL, 2018-now
    - Faculty representative in charge of the management of marks at the department for computer science of IUT de Metz, Université de Lorraine, 2016-now
    - Faculty representative dealing with *TICE* (Information and Communication Technologies for Education) at Université de Lorraine, 2015-now
    - Member of the faculty council of the department for computer science of IUT de Metz, Université de Lorraine, 2014-now
    - Deputy of the *commission de choix* (committee in charge of checking the faculty employment conditions at the IUT) of IUT de Metz, Université de Lorraine, 2014-now
    - Assistants’ representative at the faculty council of Universität Regensburg, 2010-2011
    - Mathematics PhD students’ representative at the *École Doctorale IAEM-Lorraine* (UHP), 2000-2002

## Grants:

- *SAFAR* PhD grant for Rodolphe Abou Assali’s PhD thesis, together with Georges Habib and Samuel Tapie, Université Libanaise and Université de Lorraine, 2023-2026
- *ORION* (Open up to Research through Integrated and Optimised traiNing) Master Grant for Rodolphe Abou Assali’s internship at IECL, together with Georges Habib and Samuel Tapie, Université de Lorraine, 3/07-3/11/2023
- International Emerging Action (IEA) *HOPF* together with Fida El Chami, Georges Habib, Ola Makhoul (Université Libanaise) and Simon Raulot (Université de Rouen), CNRS, 2023-2024
- *Mission de coopération scientifique 2021-2022* (travel and research grant) of the French-speaking University Association (AUF), Université Libanaise, Beirut, 13-19/02/2022
- *Mission de coopération scientifique 2018-2019* (travel and research grant) of the French-speaking University Association (AUF), Université Libanaise, Beirut, 17-24/02/2019
- Travel grant of the German Academic Exchange Service (DAAD), Université Libanaise, Beirut, 19-26/01/2014

## Supervision:

- PhD theses at Université de Lorraine:
  1. Rodolphe Abou Assali, co-supervised with Georges Habib and Samuel Tapie (2023-2026))
- Master theses at Université de Lorraine:

1. Rodolphe Abou Assali, *Théorie spectrale de l'opérateur de Steklov biharmonique*, co-supervised with Georges Habib and Samuel Tapie (09/2023)
- *Zulassungsarbeit* (bachelor thesis for training teachers) at Universität Regensburg :
    3. Philipp Schneider, *Zweidimensionale Pflasterungen*, (04/2014)
    2. Christian Schwarzkopf, *Klassifikation der zusammenhängenden geschlossenen topologischen Flächen* (04/-2015)
    1. Johanna Wutz, *Fuchs'sche Gruppen* (06/2013)

### Recent teaching<sup>2</sup>:

- 2022-2023: Exercises in differential geometry, Master course, Université de Lorraine
- 2018-now: Basics of graph theory for second-semester Bachelor students in computer science at DFHI/ISFA-  
TES (in German)
- 2014-now: Mathematics for computer scientists at Bachelor level: logics, Boolean calculus, linear algebra, calculus in one variable, graph theory, automata theory, probability theory, operations research, basic cryptography; lectures and exercises
- 2014-now: Project tutorial
- Before 2014: linear algebra, calculus in one (real, complex) and several variables, geometry (affine, differential), algebraic topology; lectures, exercises and seminars

### Others:

- Languages: French (native), English and German (fluent)

Metz, March 2, 2024

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<sup>2</sup>see [http://nicolas-ginoux.perso.math.cnrs.fr/ginoux\\_teaching.html](http://nicolas-ginoux.perso.math.cnrs.fr/ginoux_teaching.html) for a complete list