

## Jérôme VÉTOIS

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### Positions

- Since 2015 Assistant Professor, McGill University, Member of the CRM Mathematical Analysis Laboratory, International Joint Unit of the CNRS, France
- Since 2009 Maître de conférences (Assistant/Associate Professor), University of Nice Sophia Antipolis, France, on leave since Aug. 2015
- 2008 – 2009 Attaché temporaire d'enseignement et de recherche (Assistant Professor, one-year term), University of Cergy-Pontoise, France

### Diplomas

- 2017 Habilitation thesis, University of Nice Sophia Antipolis, France, defended on June 22, 2017
- 2008 PhD thesis, University of Cergy-Pontoise, France, defended on December 4, 2008, advisor: Emmanuel Hebey
- 2005 Agrégation de mathématiques (nationwide examination for teaching in France)

### Awards

- 2010 – 2015 Recipient of the Prime d'excellence scientifique (French national financial award based on academic performance, renamed Prime d'encadrement doctoral et de recherche in 2014), granted in 2010 and renewed in 2015 until my departure to McGill University

### Research Areas

- Nonlinear partial differential equations
- Nonlinear analysis on manifolds

### Preprints

- [28] F. C. Cîrstea, F. Robert and J. Vétois, *Examples of sharp asymptotic profiles of singular solutions to an elliptic equation with a sign-changing non-linearity* (2018).
- [27] J. Vétois, *Convergence result and blow-up examples for the Guan–Li mean curvature flow on warped product spaces* (2017).

Peer-reviewed journal articles
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- [26] B. Premoselli and J. Vétois, *Compactness of sign-changing solutions to scalar curvature-type equations with bounded negative part*, Journal of Differential Equations. To appear.
- [25] J. Vétois and S. Wang, *Infinitely many solutions for cubic nonlinear Schrödinger equations in dimension four*, Advances in Nonlinear Analysis. To appear.
- [24] J. Vétois, *Decay estimates and symmetry of finite energy solutions to elliptic systems in  $\mathbb{R}^n$* , Indiana University Mathematics Journal. To appear.
- [23] P.-D. Thizy and J. Vétois, *Positive clusters for smooth perturbations of a critical elliptic equation in dimensions four and five*, Journal of Functional Analysis **275** (2018), no. 1, 170–195.
- [22] J. Vétois, *A priori estimates and application to the symmetry of solutions for critical  $p$ -Laplace equations*, Journal of Differential Equations **260** (2016), no. 1, 149–161.
- [21] O. Druet, E. Hebey and J. Vétois, *Static Klein–Gordon–Maxwell–Proca systems in 4-dimensional closed manifolds II*, Journal für die reine und angewandte Mathematik **713** (2016), 149–179.
- [20] J. Vétois, *Decay estimates and a vanishing phenomenon for the solutions of critical anisotropic equations*, Advances in Mathematics **284** (2015), 122–158.
- [19] F. Robert and J. Vétois, *Sign-changing solutions to elliptic second order equations: glueing a peak to a degenerate critical manifold*, Calculus of variations and Partial Differential Equations **54** (2015), no. 1, 693–716.
- [18] F. C. Cîrstea and J. Vétois, *Fundamental solutions for anisotropic elliptic equations: existence and a priori estimates*, Communications in Partial Differential Equations **40** (2015), no. 4, 727–765.
- [17] J. Vétois, *Continuity and injectivity of optimal maps*, Calculus of variations and Partial Differential Equations **52** (2015), no. 3, 587–607.
- [16] F. Robert and J. Vétois, *Examples of non-isolated blow-up for perturbations of the scalar curvature equation*, Journal of Differential Geometry **98** (2014), no. 2, 349–356.
- [15] P. Esposito, A. Pistoia and J. Vétois, *The effect of linear perturbations on the Yamabe problem*, Mathematische Annalen **358** (2014), no. 1–2, 511–560.
- [14] F. Robert and J. Vétois, *Sign-changing blow-up for scalar curvature type equations*, Communications in Partial Differential Equations **38** (2013), no. 8, 1437–1465.
- [13] A. Pistoia and J. Vétois, *Sign-changing bubble towers for asymptotically critical elliptic equations on Riemannian manifolds*, Journal of Differential Equations **254** (2013), no. 11, 4245–4278.

- [12] P. Esposito, A. Pistoia and J. Vétois, *Blow-up solutions for linear perturbations of the Yamabe equation*, Concentration Analysis and Applications to PDE (ICTS Workshop, Bangalore, 2012), Trends in Mathematics, Birkhäuser/Springer Basel, 2013, 29–47.
- [11] F. Robert and J. Vétois, *A general theorem for the construction of blowing-up solutions to some elliptic nonlinear equations via Lyapunov-Schmidt's finite-dimensional reduction*, Concentration Analysis and Applications to PDE (ICTS Workshop, Bangalore, 2012), Trends in Mathematics, Birkhäuser/Springer Basel, 2013, 85–116.
- [10] J. Vétois, *Strong maximum principles for anisotropic elliptic and parabolic equations*, Advanced Nonlinear Studies **12** (2012), no. 1, 101–114.
- [9] J. Vétois, *Existence and regularity for critical anisotropic equations with critical directions*, Advances in Differential Equations **16** (2011), no. 1/2, 61–83.
- [8] J. Vétois, *The blow-up of critical anisotropic equations with critical directions*, NoDEA Nonlinear Differential Equations and Applications **18** (2011), no. 2, 173–197.
- [7] O. Druet, E. Hebey and J. Vétois, *Bounded stability for strongly coupled critical elliptic systems below the geometric threshold of the conformal Laplacian*, Journal of Functional Analysis **258** (2010), no. 3, 999–1059.
- [6] J. Vétois, *Asymptotic stability, convexity and Lipschitz regularity of domains in the anisotropic regime*, Communications in Contemporary Mathematics **12** (2010), no. 1, 35–53.
- [5] J. Vétois, *A priori estimates for solutions of anisotropic elliptic equations*, Nonlinear Analysis: Theory, Methods & Applications **71** (2009), no. 9, 3881–3905.
- [4] A. M. Micheletti, A. Pistoia and J. Vétois, *Blow-up solutions for asymptotically critical elliptic equations on Riemannian manifolds*, Indiana University Mathematics Journal **58** (2009), no. 4, 1719–1746.
- [3] A. El Hamidi and J. Vétois, *Sharp Sobolev asymptotics for critical anisotropic equations*, Archive for Rational Mechanics and Analysis **192** (2009), no. 1, 1–36.
- [2] E. Hebey and J. Vétois, *Multiple solutions for critical elliptic systems in potential form*, Communications on Pure and Applied Analysis **7** (2008), no. 3, 715–741.
- [1] J. Vétois, *Multiple solutions for nonlinear elliptic equations on compact Riemannian manifolds*, International Journal of Mathematics **18** (2007), no. 9, 1071–1111.

<b>Invited talks at workshops and seminars</b>
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- 2018 Analysis and PDE Seminar, Camille Jordan Institute, Claude Bernard University Lyon 1, France (Oct. 9, 2018)
- Differential Geometry, Mathematical Physics and PDE Seminar, UBC, Vancouver, Canada (Mar. 6, 2018)

- 2017 Fall Western AMS Sectional Meeting, Session on Nonlinear Elliptic Differential and Integral Equations, University of California, Riverside, US (Nov. 4, 2017)  
 Workshop on Elliptic Partial Differential Equations of Second Order: Celebrating 40 Years of Gilbarg and Trudingers Book, MATRIX, Melbourne, Australia (October 23, 2017)  
 Workshop on Geometric Properties of Local and non-Local PDEs, BIRS, Oaxaca, Mexico (May 25, 2017)  
 PDE Seminar, University of Lorraine, Metz, France (Mar. 3, 2017)  
 France-Italy Meeting in Geometric Analysis, Centro di Ricerca Matematica Ennio de Giorgi, Pisa, Italy (Feb. 22, 2017)
- 2016 International Conference on Nonlinear Partial Differential Equations: A Celebration of Professor Norman Dancer's 70th Birthday, University of New England, Armidale, Australia (Nov. 22, 2016)  
 Summer Meeting of the Canadian Mathematical Society, PDE Session, Edmonton, Canada (Jun. 26, 2016).  
 Geometry and Topology Seminar, CIRGET, Montreal, Canada (Feb. 26, 2016)  
 Quebec Mathematical Sciences Colloquium, CRM, Montreal, Canada (Jan. 29, 2016)
- 2015 Geometric CORP Seminar, Domain of Seillac, France (Sept. 17, 2015)  
 17th Mathematical Meeting of Rouen, University of Rouen, France (Jun. 18, 2015)  
 Harmonic Analysis Seminar, University Paris-Sud, Orsay, France (Jan. 12, 2015)  
 Analysis Seminar, McGill University, Montreal, Canada (Jan. 5, 2015)
- 2014 8th Australia New Zealand Mathematics Convention, Harmonic Analysis and PDE Session, University of Melbourne, Australia (Dec. 8, 2014)  
 PDE and Analysis Seminar, MSI, ANU, Canberra, Australia (Nov. 18, 2014)  
 PDE Seminar, University of Sydney, Australia (Oct. 20, 2014)  
 Inter-teams Workshop of the Laboratory J.A. Dieudonné, Lake of Como, Italy (Sept. 24, 2014)  
 Joint Regional Seminar on Geometric Analysis, CIRM, Marseille, France (Sept. 6, 2014)  
 12th Franco-Romanian Conference on Applied Mathematics, Analysis Session, University of Lyon, France (Aug. 25, 2014)  
 5th IST-IME Meeting, University of São Paulo, Brazil (Aug. 1st, 2014)
- 2013 Geometric Analysis and PDE Seminar, University of Wollongong, Australia (Sept. 3, 2013)  
 PDE Seminar, University of Sydney, Australia (Sept. 2, 2013)

- PDE and Analysis Seminar, MSI, ANU, Canberra, Australia (Aug. 27, 2013)
- 2012 Seminar of the program Conformal and Kähler Geometry, IHP, Paris, France (Nov. 14, 2012)
- Workshop on Recent Trends in Geometric and Nonlinear Analysis, BIRS, Banff Centre, Canada (Aug. 7, 2012)
- PDE Seminar, University of Sydney, Australia (May 28, 2012)
- Workshop on Cocompact Imbeddings, Profile Decompositions and their Applications to PDE, TIFR CAM, Bangalore, India (Jan. 6, 2012)
- 2011 Differential Geometry Seminar, Élie Cartan Institute, Nancy, France (Nov. 29, 2011)
- Workshop on Nonlinear Differential Equations, Pienza, Italy (Nov. 7, 2011)
- PDE Seminar, University of Sydney, Australia (May 9, 2011)
- PDE and Analysis Seminar, MSI, ANU, Canberra, Australia (Mar. 22, 2011)
- Nancy Geometric Days, Élie Cartan Institute, Nancy, France (Jan. 18, 2011)
- 2010 Analysis Seminar, Sapienza University of Rome, Italy (Nov. 8, 2010)
- Spectral Theory and Geometry Seminar, Fourier Institute, Grenoble, France (Oct. 14, 2010)
- Joint Regional Seminar on Geometric Analysis, CIRM, Marseille, France (Sept. 24, 2010)
- PDE Seminar, Brown University, Providence, US (Apr. 30, 2010)
- 2009 Analysis Seminar, McGill University, Montreal, Canada (Jul. 13, 2009)
- Conference in Geometric and Nonlinear Analysis, University of Cergy-Pontoise, France (May 26, 2009)
- AGM-LAGA Meeting, University Paris 13, France (Apr. 6, 2009)
- PDE Seminar, University of Rouen, France (Mar. 26, 2009)
- Conference on the Geometric Aspects of PDEs, CIRM, Marseille, France (Mar. 2, 2009)
- PDE Seminar, Brown University, Providence, US (Feb. 20, 2009)
- 2008 Geometry and Analysis Seminar, University of Nice Sophia Antipolis, France (Apr. 3, 2008)
- 2007 PDE Seminar, Sapienza University of Rome, Italy (Nov. 22, 2007)
- PDE and Applications Seminar, University of Poitiers, France (Oct. 25, 2007)
- MIA Laboratory Seminar, University of La Rochelle, France (Mar. 14, 2007)

<b>Organization of workshops and seminars</b>
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Since 2015	Co-organizer of a Geometric Analysis seminar, McGill University
2018	Co-organizer of the Geometric and Nonlinear PDEs session at the 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan (Jul. 5 – 6, 2018)
2018	Co-organizer of a workshop in Geometric Analysis, CRM, Montreal (Mar. 12 – 16, 2018)
2017	Co-organizer of the Nonlinear PDEs session at the Mathematical Congress of the Americas, McGill University (Jul. 25 – 26, 2017)
2014	Co-organizer of the Geometric Analysis Meeting in Nice, in honor of Professor Philippe Delanoë's 60th birthday, University of Nice Sophia Antipolis (Jun. 2 – 4, 2014)
2009 – 2013	Co-organizer of a Geometry and Analysis seminar, University of Nice Sophia Antipolis

<b>Research grants</b>
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2016 – 2021	NSERC Discovery Grant awarded for the project: Existence and Non-existence of Blowing-up Solutions for Nonlinear Elliptic Equations Arising in Physics and Geometry; \$18K per year awarded for a period of five years
2015 – 2018	McGill University Start-up Fund: \$40K awarded for a period of three years
2009 – 2012	ANR-Blanc Grant awarded for the project: Concentration Phenomena in Geometric Analysis; €150K awarded to seven researchers from different French universities for a period of three years. This project was coordinated by Emmanuel Hebey and Frank Pacard.

<b>Students and postdoctoral researchers</b>
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**Current supervision**

Winter 2019	Sia Ham and Yanting Zhou (Marianopolis College, Montreal): college-level research project (pre-university)
Since 2018	Saikat Mazumdar: postdoctoral researcher
Since 2018	Edward Chernysh: master's thesis
Since 2017	Hilton Maurer: master's thesis
Since 2017	Vladmir Sicca: PhD thesis
Since 2015	Shaodong Wang: PhD thesis

**Past supervision**

2016 – 2018	Rohit Jain: postdoctoral researcher
Fall 2018	Julian Osorio: undergraduate project

- Summer 2018 Samuel Desrochers: undergraduate project  
 Summer 2017 Edward Chernysh: undergraduate project  
 Summer 2017 Samuel Desrochers: undergraduate project  
 Summer 2016 Edward Chernysh: undergraduate project  
 Summer 2016 David Michel (ENS Rennes, *France*): master's project

<b>PhD thesis committees</b>
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| Since 2017 | Chair of the PhD preliminary oral examinations, Department of Mathematics and Statistics, McGill University (14 examinations since January 2017)                            |
| 2018       | Pro-Dean on the doctoral defence of Vanessa Bao, Department of Educational and Counselling Psychology, McGill University (June 19, 2018)                                    |
| 2018       | Internal examiner for the PhD thesis of Mikhail Karpukhin, Department of Mathematics and Statistics, McGill University (May 30, 2018)                                       |
| 2018       | Internal examiner for the PhD thesis of Janine Bachrachas, Department of Mathematics and Statistics, McGill University (June 4, 2018)                                       |
| 2017       | Principal examiner for the PhD preliminary oral examination of Shaodong Wang, Department of Mathematics and Statistics, McGill University (January 13, 2017)                |
| 2016       | Member of the examining committee for the PhD preliminary oral examination of Mikhail Karpukhin, Department of Mathematics and Statistics, McGill University (July 5, 2016) |
| 2015       | Member of the PhD thesis committee for Alexandra Tcheng, Department of Mathematics and Statistics, McGill University (Sept. 10, 2015)                                       |

<b>Departmental committees</b>
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| 2017 – 2019 | Member of the Committee on Graduate Affairs, Department of Mathematics and Statistics, McGill University       |
| 2016 – 2018 | Member of the Nominating and Procedures Committee, Department of Mathematics and Statistics, McGill University |
| 2015 – 2017 | Member of the Committee on Undergraduate Affairs, Department of Mathematics and Statistics, McGill University  |

<b>Refereeing activities</b>
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- **Referee for international journals, including the following:** Advanced Nonlinear Studies, Advances in Differential Equations, Advances in Nonlinear Analysis, Advances in Mathematics, Analysis & PDE, Annales de l'Institut Henri Poincaré, Calculus of Variations and Partial Differential Equations, Communications in Contemporary Mathematics, Duke Mathematical Journal, Indiana University Mathematics Journal, International Mathematics Research Notices, Journal of

Differential Equations, Journal of Functional Analysis, Journal of Geometric Analysis, Journal of Mathematical Analysis and Applications, Journal of the London Mathematical Society, Nonlinear Analysis, Pacific Journal of Mathematics, Potential Analysis, Proceedings of the Edinburgh Mathematical Society, Publications Mathématiques de l'IHES, SIAM Journal on Mathematical Analysis, Transactions of the AMS

- **Referee for grant applications to the following organizations:** Canadian Natural Sciences and Engineering Research Council (NSERC), Chilean National Science and Technology Commission (CONICYT)

<b>Teaching experience</b>
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**At McGill University, Montreal, Canada**

Winter 2018 and 2019 MATH 455: Honours Analysis 4  
 Fall 2017 and 2018 MATH 242: Analysis 1  
 Fall 2016 MATH 254: Honours Analysis 1  
 Winter 2016 MATH 249: Honours Complex Variables  
 Fall 2015 and 2016 MATH 580: Partial Differential Equations (graduate level)

**At the University of Nice Sophia Antipolis, France**

Winter 2012 to 2015 Applied Quantitative Techniques (main lectures and class work sessions)  
 Winter 2015 Mathematical Modelling (main lectures and class work sessions)  
 Fall 2013 Differential Calculus (class work sessions)  
 Fall 2011 and 2012 Prerequisites in Analysis (graduate level)  
 Fall 2009 to 2011 Analysis (main lectures and class work sessions)  
 Fall 2009 and 2010 Statistics (class work sessions)

**At the University of Cergy-Pontoise, France**

Fall 2008 Variational Methods (class work sessions)  
 Fall 2008 Analysis in  $\mathbb{R}^n$  (class work sessions)  
 2005 to 2008 Mathematics for Sciences (class work sessions)

**At TIFR CAM, Bangalore, India**

Fall 2012 Series of six lectures on Scalar Curvature-type Equations for graduate students