

## Jérôme VÉTOIS

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### Positions

- 2015 – Assistant Professor, McGill University, Member of the CRM Mathematical Analysis Laboratory, International Joint Unit of the CNRS, France
- 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 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

- [27] F. C. Cirstea, F. Robert and J. Vétois, *Examples of sharp asymptotic profiles of singular solutions to an elliptic equation with a sign-changing non-linearity*. Preprint on arXiv:1801.00367.
- [26] J. Vétois, *Convergence result and blow-up examples for the Guan–Li mean curvature flow on warped product spaces*. Preprint on arXiv:1705.10839.

Peer-reviewed journal articles
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- [25] 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. 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] J. Vétois and S. Wang, *Infinitely many solutions for cubic nonlinear Schrödinger equations in dimension four*, Advances in Nonlinear Analysis. To appear.
- [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 Differential Geometry, Mathematical Physics and PDE Seminar, UBC, Vancouver (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 (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 (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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| 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, Montréal (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)   |
| 2015 –      | Co-organizer of a Geometric Analysis seminar, McGill University   |
| 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 supervision</b>
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| 2018 – | Edward Chernysh: Master's thesis                    |
| 2018   | Samuel Desrochers: undergraduate project            |
| 2017 – | Vladmir Sicca: PhD thesis                           |
| 2017 – | Hilton Maurer: Master's thesis                      |
| 2017   | Edward Chernysh: undergraduate project              |
| 2017   | Samuel Desrochers: undergraduate project            |
| 2016 – | Rohit Jain: Postdoctoral position                   |
| 2016   | Edward Chernysh: undergraduate project              |
| 2016   | David Michel (ENS Rennes, France): Master's project |
| 2015 – | Shaodong Wang: PhD thesis                           |

<b>Committee memberships</b>
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2018	Pro-Dean for the PhD oral 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 –	Chair of the PhD preliminary oral examinations, Department of Mathematics and Statistics, McGill University
2017 – 2019	Member of the Committee on Graduate Affairs, Department of Mathematics and Statistics, McGill University
2017	Examiner for the PhD preliminary oral examination of Shaodong Wang, Department of Mathematics and Statistics, McGill University (January 13, 2017)
2016 – 2018	Member of the Nominating and Procedures Committee, Department of Mathematics and Statistics, McGill University
2016	Examiner for the PhD preliminary oral examination of Mikhail Karpukhin, Department of Mathematics and Statistics, McGill University (July 5, 2016)
2015 – 2017	Member of the Committee on Undergraduate Affairs, Department of Mathematics and Statistics, McGill University
2015	Member of the PhD thesis committee for Alexandra Tchong, Department of Mathematics and Statistics, McGill University (Sept. 10, 2015)
2015	Chair of a Baccalauréat committee (French national secondary school diploma), Lycée Parc Impérial, Nice, France (Jul. 6 and 9, 2015)

<b>Refereeing activities</b>
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I served as a referee for several journals including the following:

Advanced Nonlinear Studies, Advances in Differential Equations, Advances in Nonlinear Analysis, Advances in Mathematics, Analysis & PDE, 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, Nonlinear Analysis, Pacific Journal of Mathematics, Potential Analysis, Publications Mathématiques de l'IHES, Transactions of the AMS

<b>Teaching experience</b>
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**At McGill University**

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

**At the University of Nice Sophia Antipolis**

Winters 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)  
 Falls 2011 and 2012 Prerequisites in Analysis (graduate level)  
 Falls 2009 to 2011    Analysis (main lectures and class work sessions)  
 Falls 2009 and 2010   Statistics (class work sessions)

**At the University of Cergy-Pontoise**

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