

Jérôme VÉTOIS

Department of Mathematics and Statistics, McGill University
Burnside Hall, 805 Sherbrooke Street West, Room 914
Montreal, Quebec H3A 0B9, Canada

Tel.: (+1)-514-398-3829

Fax: (+1)-514-398-3899

Email: jerome.vetois@mcgill.ca

Webpage: www.math.mcgill.ca/vetois/

Positions

- 2019 – Associate Professor, McGill University, Montreal, Canada
Member of the CRM Mathematical Analysis Laboratory (International Joint Unit of the CNRS, France)
- 2015 – 2019 Assistant Professor, McGill University, Montreal, Canada
- 2009 – 2015 Maître de conférences (Assistant/Associate Professor), University of Nice Sophia Antipolis, France
- 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 (French nationwide examination for teaching)

Research Areas

- Nonlinear partial differential equations
- Nonlinear analysis on manifolds

Preprints

- [35] B. Premoselli and J. Vétois, *Sign-changing blow-up for the Yamabe equation at the lowest energy level*, arXiv:2206.08770 (2022).
- [34] S. Mazumdar and J. Vétois, *Existence results for the higher-order Q -curvature equation*, arXiv:2007.10180 (2020).

Peer-reviewed Journal Articles

- [33] B. Premoselli et J. Vétois, *Stability and instability results for sign-changing solutions to second-order critical elliptic equations*, Journal de Mathématiques Pures et Appliquées (to appear).
- [32] F. Robert and J. Vétois, *Blowing-up solutions for second-order critical elliptic equations: the impact of the scalar curvature*, International Mathematics Research Notices (to appear). Extended version at arXiv:1912.09376.

- [31] S. Mazumdar and J. Vétois, *Non-synchronized solutions to nonlinear elliptic Schrödinger systems on a closed Riemannian manifold*, Discrete and Continuous Dynamical Systems **42** (2022), no. 11, 5273–5287.
- [30] L. Martinazzi, P.-D. Thizy and J. Vétois, *Sign-changing blow-up for the Moser–Trudinger equation*, Journal of Functional Analysis **282** (2022), no. 2, 109288, 85 p.
- [29] J. Vétois, *Convergence result and blow-up examples for the Guan–Li mean curvature flow on warped product spaces*, Communications in Analysis and Geometry **29** (2021), no. 8, 1917–1935.
- [28] S. Shakerian and J. Vétois, *Sharp pointwise estimates for weighted critical p -Laplace equations*, Nonlinear Analysis: Theory, Methods & Applications **206** (2021), 112236, 18 p.
- [27] 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*, Mathematische Annalen **375** (2019), no. 3–4, 1193–1230.
- [26] B. Premoselli and J. Vétois, *Compactness of sign-changing solutions to scalar curvature-type equations with bounded negative part*, Journal of Differential Equations **266** (2019), no. 11, 7416–7458.
- [25] J. Vétois, *Decay estimates and symmetry of finite energy solutions to elliptic systems in \mathbb{R}^n* , Indiana University Mathematics Journal **68** (2019), no. 3, 663–696.
- [24] J. Vétois and S. Wang, *Infinitely many solutions for cubic nonlinear Schrödinger equations in dimension four*, Advances in Nonlinear Analysis **8** (2019), no. 1, 715–724.
- [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.

Invited Talks at Workshops and Seminars
--

- 2022 Geometric Analysis Seminar, IIT Bombay, Mumbai (online, Nov. 24, 2022)
 International Symposium on PDE and Geometric Analysis, University of Mumbai (online, Mar. 19, 2022)
 Virtual Seminar on Geometric and Functional Inequalities and Applications, co-organized by J. Flynn (University of Connecticut), N. Lam (Memorial University of Newfoundland), J. Li (Brown University) and G. Lu (University of Connecticut) (online, Mar. 7, 2022)
- 2021 Workshop on Nonlinear Elliptic and Parabolic Partial Differential Equations, CIRM, Leviso Terme (hybrid mode, Oct. 12, 2021)
 Canadian Mathematical Society 75th Anniversary Summer Meeting, Geometric Analysis session, University of Ottawa (online, June 8, 2021)
- 2019 Winter Meeting of the Canadian Mathematical Society, Geometric Analysis and Mathematical Relativity Session, Toronto, Canada (Dec. 8, 2019)
 PDE Seminar, Brown University, Providence, US (Dec. 6, 2019)
 Workshop on Nonlinear Geometric PDE, Banff International Research Station, Banff Centre, Canada (May 9, 2019)
- 2018 Analysis and PDE Seminar, Camille Jordan Institute, Claude Bernard University Lyon 1, France (Oct. 9, 2018)
 Differential Geometry, Mathematical Physics and PDE Seminar, University of British Columbia, 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, Banff International Research Station, 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, University of Alberta, 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, ANU Mathematical Sciences Institute, Canberra, Aus-
 tralia (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, Uni-
 versity 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, ANU Mathematical Sciences Institute, Canberra, Aus-
 tralia (Aug. 27, 2013)
- 2012 Seminar of the program Conformal and Kähler Geometry, Henri Poincaré Institute,
 Paris, France (Nov. 14, 2012)
 Workshop on Recent Trends in Geometric and Nonlinear Analysis, Banff International
 Research Station, 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 Centre for Applicable Mathematics, Bangalore, India (Jan. 6, 2012)
- 2011 Differential Geometry Seminar, Élie Cartan Institute, Henri Poincaré University,
 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, ANU Mathematical Sciences Institute, Canberra, Aus-
 tralia (Mar. 22, 2011)
 Nancy Geometric Days, Élie Cartan Institute, Henri Poincaré University, Nancy,
 France (Jan. 18, 2011)
- 2010 Analysis Seminar, Sapienza University of Rome, Italy (Nov. 8, 2010)
 Spectral Theory and Geometry Seminar, Fourier Institute, Joseph Fourier University,
 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)

Organization of Workshops and Seminars

- | | |
|-------------|--|
| Since 2015 | Co-organizer of the Geometric Analysis seminar, McGill University (online since March 2020) |
| 2021 | Co-organizer of the workshop on Nonlinear Potential Theoretic Methods in Partial Differential Equations, Banff International Research Station, Banff Centre, Canada (online, Sept. 6 – 10, 2021) |
| | Co-organizer of the Nonlinear Analysis on Manifolds session at the Canadian Mathematical Society 75th Anniversary Summer Meeting, University of Ottawa (online, June 7 – 11, 2021) |
| 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) |
| | 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 the Geometry and Analysis seminar, University of Nice Sophia Antipolis |

Research Grants

- 2022 – 2027 NSERC Discovery Grant awarded for the project: Analysis and applications of nonlinear problems with lack of compactness; \$21K per year awarded for a period of five years
- 2016 – 2022 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, extended by one year
- 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.

Postdoctoral Mentoring

- 2022 – Joshua Flynn, McGill University (current mentoring)
- 2018 – 2019 Saikat Mazumdar, McGill University (currently Assistant Professor at the Indian Institute of Technology Bombay)
- 2016 – 2018 Rohit Jain, McGill University (currently Data Analyst at the Lawrence Livermore National Laboratory, US)

PhD Students Supervision

- 2020 – Edward Chernysh, McGill University (current supervision)
- 2017 – 2022 Vladimir Sicca Gonçalves, McGill University (current supervision)
- 2015 – 2019 Shaodong Wang, McGill University (currently Postdoctoral Fellow at Shanghai Jiao Tong University)

Master's Students Supervision

- 2022 – Samuel Zeitler, McGill University (current supervision)
- 2020 – 2022 Marc-Andrew Lavigne, McGill University (current supervision)
- 2018 – 2020 Edward Chernysh, McGill University
- 2017 – 2020 Hilton Maurer, McGill University
- Summer 2016 David Michel, ENS Rennes

Undergraduate and Pre-university Students Supervision
--

- Summer and fall 2022 Zehai Wen, McGill University
- Winter and summer 2021 Yuxiu Zhang, McGill University
- Winter 2020 Jack Richter-Powell, McGill University
- Fall 2019 Daniela Breitman, McGill University

Summer 2019	Lydia Mezrag, McGill University
Summer 2019	Huangchen Zhou, McGill University
Winter 2019	Sia Ham and Yanting Zhou, Marianopolis College
Fall 2018	Julian Osorio, McGill University
Summers 2017 and 2018	Samuel Desrochers, McGill University
Summers 2016 and 2017	Edward Chernysh, McGill University

Master's and PhD Students Evaluation

2021	Chair and external examiner for the PhD thesis of Hussein Mesmar, Élie Cartan Institute, University of Lorraine, Nancy, France (Dec. 2021)
2021	Internal Examiner for the PhD thesis of Fengrui Yang, Department of Mathematics and Statistics, McGill University (Apr. 2021)
2020	Internal Examiner for the Master's thesis of Bartosz Syroka, Department of Mathematics and Statistics, McGill University (Sept. 2020)
2020	Internal Examiner for the Master's thesis of Peter Yuen, Department of Mathematics and Statistics, McGill University (Mar. 2020)
2019	Member of the PhD thesis committee for Mahdi Ammar, Department of Mathematics, Université du Québec à Montreal (Jun. 2019)
2017 – 2018	Chair of the PhD preliminary oral examinations, Department of Mathematics and Statistics, McGill University (14 examinations between Jan. 2017 and Jun. 2018)
2018	Pro-Dean on the doctoral defence of Vanessa Bao, Department of Educational and Counselling Psychology, McGill University (Jun. 2018)
2018	Internal Examiner for the PhD thesis of Mikhail Karpukhin, Department of Mathematics and Statistics, McGill University (May 2018)
2018	Internal Examiner for the PhD thesis of Janine Bachrachas, Department of Mathematics and Statistics, McGill University (Jun. 2018)
2015	Member of the PhD thesis committee for Alexandra Tchong, Department of Mathematics and Statistics, McGill University (Sept. 2015)

Service Activities at the Department of Mathematics and Statistics of McGill University
--

2022 –	Graduate Program Director
2019 – 2021	Member of the Committee on Undergraduate Affairs
2017 – 2019	Member of the Committee on Graduate Affairs
2016 – 2018	Member of the Nominating and Procedures Committee
2015 – 2017	Member of the Committee on Undergraduate Affairs

Other Service Activities

- 2020 – Disciplinary Officer, Faculty of Science, McGill University
- 2015 – Chair of a Baccalaureate Committee (French secondary school diploma), Lycée Parc Impérial, Nice, France (Jul. 6 and 9, 2015)

Refereeing Activities

- **Referee for international journals, including the following:** Advances in Calculus of Variations, Advanced Nonlinear Studies, Advances in Differential Equations, Advances in Nonlinear Analysis, Advances in Mathematics, Analysis & PDE, Annales de l'Institut Henri Poincaré, Annali di Matematica Pura ed Applicata, Calculus of Variations and Partial Differential Equations, Canadian Journal of Mathematics, Communications in Contemporary Mathematics, Complex Variables and Elliptic Equations, Differential Equations & Applications, Differential Geometry and its Applications, Discrete and Continuous Dynamical Systems, Duke Mathematical Journal, Indiana University Mathematics Journal, International Mathematics Research Notices, Journal de Mathématiques Pures et Appliquées, Journal of Differential Equations, Journal of Functional Analysis, Journal of Geometric Analysis, Journal of Mathematical Analysis and Applications, Journal of Nonlinear Science, Journal of the London Mathematical Society, Mathematical Methods in the Applied Sciences, Mathematische Annalen, Nonlinear Analysis, Nonlinear Differential Equations and Applications (NoDEA), Pacific Journal of Mathematics, Potential Analysis, Proceedings of the American Mathematical Society, Proceedings of the Edinburgh Mathematical Society, Publications Mathématiques de l'IHÉS, Pure and Applied Mathematics Quarterly, SIAM Journal on Mathematical Analysis, Transactions of the American Mathematical Society, Tunisian Journal of Mathematics
- **Referee for grant applications to the following organizations:** Canadian Natural Sciences and Engineering Research Council (NSERC), Chilean National Science and Technology Commission (CONICYT), Sapienza University of Rome

Teaching Experience

At McGill University, Montreal, Canada

Fall 2022	MATH 564: Advanced Real Analysis 1 (graduate level)
Winter 2022	MATH 455: Honours Analysis 4
Winter 2021	MATH 222: Calculus 3
Fall 2020	MATH 264: Advanced Calculus for Engineers
Falls 2019 and 2020	MATH 454: Honours Analysis 3
Wintesr 2016 and 2019	MATH 249: Honours Complex Variables
Winters 2018 and 2019	MATH 455: Honours Analysis 4
Falls 2017 to 2019	MATH 242: Analysis 1
Fall 2016	MATH 254: Honours Analysis 1

Falls 2015 and 2016 MATH 580: Partial Differential Equations (graduate level)

At the University of Nice Sophia Antipolis, France

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, 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 the TIFR Centre for Applicable Mathematics, Bangalore, India

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