

# Mehdi Lejmi

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Department of Mathematics and Computer Science,  
Bronx Community College of City University of New York,  
CP 315, 2155 University Avenue,  
Bronx, NY 10453, USA.

## Experience:

- **Doctoral Faculty, Graduate Center of City University of New York, New York City, USA.** September 2020-Present.
- **Associate professor, Bronx Community College of City University of New York, Bronx, USA.** September 2019-Present.
- **Assistant professor, Bronx Community College of City University of New York, Bronx, USA.** January 2016-August 2019.
- **Visiting assistant professor, Université de Québec à Montréal, Montreal, Canada.** September 2015-December 2015.
- **Post-Doctoral researcher, Université Libre de Bruxelles, Brussels, Belgium.** September 2013-August 2015.
- **Visiting researcher, Notre Dame University, South Bend, USA.** January-August 2013.
- **Visiting researcher, Florida International University, Miami, USA.** September-December 2012.
- **Visiting assistant professor, University of Minnesota, Minneapolis, USA.** September 2011-August 2012.
- **Assistant professor, Vanderbilt University, Nashville, USA.** September 2010-August 2011.

## Education:

- **Ph.D. in Mathematics (July 2010), Université de Québec à Montréal, Montreal, Canada.** Thesis supervisor: Prof. Vestislav Apostolov.
- **M.Sc. in Mathematics (2007), Université de Québec à Montréal.**
- **B.Sc. in Mathematics (2006), Université de Québec à Montréal.**

**Awards:**

- **The Simons Foundation Collaboration Grant for Mathematicians** award #636075, 2019-2024.
- **PSC-CUNY**<sup>1</sup> award #62380-00 50, Summer 2019.
- **Enhanced PSC-CUNY** award #61768-00 49 (co-PI), 2018-2019.
- **PSC-CUNY** award #60053-00 48, Summer 2017.
- **University of Turin “Analysis on manifolds” Fellowship**, Turin, Italy, 2015-2016.
- **FQRNT**<sup>2</sup> **Postdoctoral Research Fellowship**, 2010-2012.
- **Institut des Sciences Mathématiques Fellowship**, Montreal, Canada. 2009-2010.
- **NSERC**<sup>3</sup> **Canada Graduate Scholarship**, 2006-2009.
- **FQRNT** **Quebec Graduate Scholarship**, 2006-2009.
- **Université de Québec à Montréal Excellence Fellowship**, 2005.
- **Institut des Sciences Mathématiques Fellowship**, Montreal, Canada. 2004-2005.
- **Institut des Sciences Mathématiques Undergraduate Summer Research Fellowship**, Montreal, Canada. 2004.
- **CIRGET**<sup>4</sup> **Undergraduate Summer Research Fellowship**, Montreal, Canada. 2003.

**Research interests:**

Differential geometry, Kähler geometry, Hermitian geometry, Hypercomplex geometry, Sasakian geometry.

**Publications and Preprints:**

- **[01] On the invariant and anti-invariant cohomologies of hypercomplex manifolds**, with Nicoletta Tardini; preprint (2023).

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<sup>1</sup>The Professional Staff Congress of City University of New York

<sup>2</sup>Fonds de Recherche du Québec Nature et technologies, Quebec, Canada.

<sup>3</sup>Natural Sciences and Engineering Research Council.

<sup>4</sup>Centre Interuniversitaire de Recherche en Géométrie et Topologie, Montreal.

- [02] **Canonical almost-Kähler metrics dual to general plane-fronted wave Lorentzian metrics**, with Xi Sisi Shen; *Mathematische Zeitschrift* 303 (2023), no. 4, Paper No. 94, 15 pp.
- [03] **Second-Chern-Einstein metrics on 4-dimensional almost-Hermitian manifolds**, with Giuseppe Barbaro; *Complex Manifolds* 10 (2023), no. 1, Paper No. 20220150, 24 pp.
- [04] **Hermitian metrics of constant Chern scalar curvature on ruled surfaces**, with Caner Koca; *Kodai Mathematical Journal* 43 (2020), no. 3, 409–430.
- [05] **Einstein–Maxwell equations on 4-dimensional Lie algebras**, with Caner Koca; *Canadian Mathematical Bulletin* 62 (2019), no. 4, 822–840.
- [06] **4-dimensional almost-Kähler Lie algebras of constant Hermitian holomorphic sectional curvature are Kähler**, with Luigi Vezzoni; *Journal of Lie Theory*, 29 (2019), No. 1, 181–190.
- [07] **Closed almost-Kähler 4-manifolds of constant non negative Hermitian holomorphic sectional curvature are Kähler**, with Markus Upmeyer; *Tohoku Mathematical Journal* (2) 72 (2020), no. 4, 581–594.
- [08] **On the Chern–Yamabe flow**, with Ali Maalaoui; *Journal of Geometric Analysis*, 28 (2018) No. 3, 2692–2706.
- [09] **Integrability theorems and conformally constant Chern scalar curvature in almost Hermitian geometry**, with Markus Upmeyer; *Communications in Analysis and Geometry* 28 (2020), no. 7, 1603–1645.
- [10] **Lower bounds on the  $L^2$ -norm of the Hermitian scalar curvature**, with Julien Keller; *Journal of Symplectic Geometry* 18 (2020), no. 2, 537–558.
- [11] **Cohomologies on hypercomplex manifolds**, with Patrick Weber; *Springer INdAM Series*, Vol. 21 (2017), 107–121, Springer, Cham., 2017.
- [12] **Quaternionic Bott–Chern cohomology and existence of HKT metrics**, with Patrick Weber; *The Quarterly Journal of Mathematics*, Volume 68 (2017), Issue 3, 705–728.
- [13] **Seiberg–Witten invariants on manifolds with Riemannian foliations of codimension 4**, with Patrick Weber and Yuri Kordyukov; *Journal of Geometry & Physics*, 107 (2016), 114–135.
- [14] **Existence of HKT metrics on hypercomplex manifolds of real dimension 8**, with Gueo Grantcharov and Misha Verbitsky, *Advances in*

Mathematics, 320 (2017), 1135–1157.

- [15] **Extremal K-contact metrics**, with Markus Upmeyer, *Matimatische Zeitschrift*, 281 (2015), No 3-4, pp. 673–687.
- [16] **The J-flow and stability**, with Gábor Székelyhidi, *Advances in Mathematics*, 274 (2015), 404–431.
- [17] **Stability under deformations of Hermitian-Einstein almost-Kähler metrics**, *Annales de l’institut Fourier*, 64 (2014), No. 6, pp. 2251–2263.
- [18] **Stability under deformations of extremal almost-Kähler metrics in dimension 4**, *Math. Research Letters*, 17 (2010), No. 04, pp. 601–612.
- [19] **Extremal almost-Kähler metrics**, *International Journal of Mathematics*, 21 (2010), No. 12, pp. 1639–1662.
- [20] **Strictly nearly Kähler 6-manifolds are not compatible with symplectic forms**, *Comptes Rendus Math. Académie Sciences Paris*, **343** (2006), No. 11-12, pp. 759–762.

**Teaching as instructor:**

- **Bronx Community College of CUNY**, 2016-Present.
- **Université de Québec à Montréal**, Fall 2015, Fall 2009.
- **University of Minnesota**, Spring 2012.
- **Vanderbilt University**, 2010-2011.

**Selected invited Talks:**

- **Informal Geometric Analysis seminar, University of Maryland.** April 2023.
- **Informal Complex Geometry and PDE Seminar, Columbia University.** April 2023.
- **Conference Special metrics in Complex Geometry, University of Texas at Dallas.** May 2022.
- **Topology and Geometric Group Theory Seminar, Ohio State University.** November 2021.
- **Geometry Seminar, Vanderbilt University.** April 2021.

- **Geometry Seminar, Clark University.** April 2021.
- **Differential Geometry and Complex Analysis Seminar, University of Florence.** Italy. November 2020.
- **Geometry Seminar, Florida International University.** November 2020.
- **The Colloquium, University of Rutgers, Newark.** February 2020.
- **Analysis Seminar, University of Giessen.** Germany. January 2020.
- **PDE and Differential Geometry Seminar, University of Connecticut.** September 2019.
- **Differential Geometry Seminar, Princeton University.** September 2018.
- **Shanks Workshop on Complex Differential Geometry, Vanderbilt University.** March 2018.
- **Differential Geometry Seminar, Stony Brook University.** November 2017.
- **Differential Geometry Seminar, University of Missouri.** September 2017.
- **Differential Geometry Seminar, University of Augsburg.** Germany. July 2017.
- **Differential Geometry Seminar, University of Turin.** Italy. June 2017.
- **Winter Conference on Geometry, Topology and Applications, Florida International University.** January 2017.
- **INdAM Meeting on Complex and Symplectic Geometry, Cortona, Italy.** June 2016.
- **Mathematics Colloquium, City College of New York.** May 2016.
- **Differential Geometry seminar, CUNY Graduate Center.** March 2016.
- **Centre Interuniversitaire de Recherche en Géométrie et Topologie, Montreal.** Canada. November 2015.

- **DyGeSt WP3 Geometry, quantization and operator algebras, University of Luxembourg.** Luxembourg. June 2015.
- **Séminaire de géométrie, Université de Nantes.** France. Avril 2015.
- **Séminaire d'algèbre et géométries, Institut Fourier, Grenoble.** France. March 2015.
- **Séminaire de géométrie et topologie, Université de Bretagne Occidentale.** France. Février 2015.
- **Oberseminar Geometrie, Topologie und Analysis, University of Cologne.** Germany. November 2014.
- **Séminaire Géométrie, Dynamique et Topologie, Institut de mathématiques de Marseille.** France. November 2014.
- **Séminaire d'analyse et de géométrie, Institut de mathématiques de Jussieu.** France. October 2014.
- **Geometry days in Sofia, International conference Mathematics days in Sofia.** Bulgaria. July 2014.
- **Centre Interuniversitaire de Recherche en Géométrie et Topologie, Montreal.** Canada. March 2014.
- **Séminaire de géométrie différentielle, Institut de Mathématiques de Toulouse.** France. January 2014.
- **Differential Geometry Seminar, Université Libre de Bruxelles.** Belgium. October 2013.
- **Seminar on geometric structures, Laboratory of algebraic geometry and its applications, High School of Economics, Moscow.** Russia. May 2013.
- **Differential Geometry Seminar, Notre Dame University.** April 2013.
- **Mathematics seminar, Florida International University.** September 2012.
- **Differential Geometry Seminar, University of Michigan.** 2012.
- **Differential Geometry and Symplectic Topology Seminar, University of Minnesota.** 2011.

- **Kähler and Differential Geometry, Shanks Workshop, Vanderbilt University. 2010.**
- **Algebraic Geometry Seminar, Université de Québec à Montréal. Canada. 2009.**
- **Special Session “Symplectic, Contact and Complex Structures on Manifolds”, Sectional AMS Meeting, Pennsylvania. 2009.**

**Synergistic activities:**

- Co-organizer of the Differential Geometry, Topology, and Special Structures seminar at CUNY Graduate Center.
- Co-organizer of the CUNY Kähler Geometry Workshop, Brooklyn, January 2019.
- Co-organizer of the American Mathematical Society special session “Hermitian Geometry” for the Spring 2018 Meeting at Vanderbilt University.
- American Mathematical Society reviewer.
- Supervisor of undergraduate students under the CUNY Research Scholars Program, LSAMP program, PTS3 program and Honors contract program.