

## **ABDELHAMID MEZIANI**

Department of Mathematics and Statistics

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### **Education**

- Ph.D. Mathematics (1988), Rutgers University, New Jersey. Advisor François Treves
- Doctorat de 3<sup>rd</sup> cycle, Mathematics (1984), Université de Paris XI, Orsay, France
- Master (DEA) Mathematics (1982), Université de Paris XI, Orsay, France
- B.S. Mathematics (1981), Université d'Alger, Algeria

### **Employment**

- Chair, Department of Mathematics & Statistics, FIU, August 2013 to August 2018
- Professor, Florida International University, 1997 to Present
- Associate Professor, Florida International University, 1993 to 1997
- Assistant Professor, Florida International University, 1988 to 1993
- Visiting Professor, Oak Ridge National Laboratory, 2004
- Teaching Assistant, Rutgers University, 1984 to 1988
- Instructor, Université de Paris XI, 1983 to 1984.

### **Service**

#### **Service to the Department**

- Served on the Ph.D. Program Development Committee (2011-12)
- Human Resources Committee (several years)
- Recruitment Committee (several years)
- Ph.D. Feasibility Committee (2002-2003)
- Graduate Faculty Committee (several years)
- Department review committee (2003)
- Merit Raise Committee (2000-2001)
- Graduate Committee (1992 to 1998)
- Graduate Program Director (1995 to 1998)
- Acting Chair (August 97; August 98; July 99; 1 week in February 2000, 3 weeks in 2008)
- Colloquium Committee (1998-2001)
- Ad Hoc Committees (SACS, Ph.D., Lower Division, Differential Teaching, BA in Math Education)
- Course Coordinator (MAP4401, MAP5317, MAP4401L, MAP3301, MAP3301L)
- Observation of Teaching of Adjunct Faculty (several times)
- Report about the Computer Assisted Teaching of College Algebra through Academic Systems
- Served on several Theses Committees

### **Service to the University**

- Served on G2C (Graduation to Completion) Committee 2014
- Serving on Access Workgroup Committee (Office of Engagement) Fall 2013
- Served on a Thesis Committee for an MS in Physics (August 2003)
- Served on a Dissertation Committee for a PhD in Psychology (2005)
- Committee to review a course proposal from the Mechanical Engineering Department
- Advised students involved in the Gateway Engineering Program (1995 and 1996)
- Served as a member of the review panel for the 2000 Provost's Office Summer Research Competition

### **Service to the profession**

- Serving on the Editorial Board of *Complex Variables and Elliptic Equations*
- Serving as an editor for a special issue of *International Journal of Mathematics and Mathematical Sciences*
- Serving on the *Steering Committee on Book Donations of the American Mathematical Society*
- Serving as Co-Advisor to a PhD student (Camilo Campana ) from University of Sao Paulo Brazil, 2014-Present
- Co editor of “*Geometric Analysis of Several Complex Variables and Related Topics*”, Contemporary Mathematics (Amer. Math. Soc.), Vol 550 (2011)
- Co-organizer of an international conference “*Geometric Analysis of PDEs and related topics*” Marrakesh, Morocco, May 2010
- Co-organizer of a special session of the AMS Meeting at FIU, April 06
- Co-editor “*Geometric Analysis of PDE and Several Complex Variables*”, volume 368 of the series *Contemporary Mathematics*, American Mathematical Society
- Co-organizer of an international conference on PDE and Complex variables, August 2005, in Sao Paulo (Brazil)
- Co-organized an international conference on PDE and Complex variables, August 2003, in Sao Paulo (Brazil).
- Serving since 1994 as a reviewer for Mathematical Reviews (Amer. Math. Soc.)
- Served as a referee for papers submitted to various mathematical journals including *Advances in Mathematics* , *Journal of Differential Equations*, *American Journal of Mathematics*, *Communications in PDE*, *Transactions of the AMS etc.*
- Served as a reviewer for grants submitted to NSF and for a proposal submitted to Temple University.
- Served as a reviewer for a book on CR structures (Cambridge University Press)
- Served as an external reviewer for the promotion to Full Professor of Seid Mohamed (University of Addis Ababa)
- Served as an outside reviewer for the PhD dissertation Hugo Campos, CINVESTAV, MEXICO
- Serving as Co-Advisor to two PhD students (A. Ainouz and K. Boutarene) from the university USTHB, Algiers, Algeria

- Helped in Curriculum Development for the PhD program in Mathematics of the University of Addis Ababa, Ethiopia
- Served on the Forum Mathematics in Africa (Abdus Salem Center – ICTP)

### **Service to the community**

- Participated in meeting with Miami-Dade County Public School officials and math teachers 2013-14
- Visits to high schools to meet talk with high school teachers 2013-14
- Served as judge for the NAACP 26<sup>th</sup> National ACT-SO Competition of the NAACP , Miami, July 2003
- Conducted workshops in the History of Math for Dade County Public School Teachers
- Visit to Barbara Coleman High School on Math Collegiate Days (1998 and 1999)

### **Teaching at Florida International University**

#### **Undergraduate Courses**

Calculus I; Calculus II; Multivariable Calculus; Linear Algebra; Differential Equations; Numerical Analysis; College Geometry; Introduction to Analysis; Algebraic Structures; Topology; Advanced Calculus; Advanced Differential Equations; Complex Variables; History of Mathematics; Number Theory; Geometry for Educators; College Algebra; Mathematical Modeling

#### **Graduate Courses**

Real Analysis; Ordinary Differential Equations; Partial Differential Equations; Special Topics in PDE; Complex Analysis; Applied Linear Algebra; Training in Mathematical Expositions.

#### **Graduate Student Supervision**

- Melvin Kollie
- Bruno
- Witny Librun
- Aleksandr Shneyderman
- Roberto Rozsa
- Camilo Campana (PhD Brazil): Serving as Co-Advisor

#### **Postdoc Supervision**

- Giuliano Zugilani
- Paulo Dattori
- Abdelhamid Ainouz (PhD Algeria): Serving as Co-Advisor
- Khaled Boutarene (PhD Algeria): Serving as Co-Advisor

#### **Curriculum Development**

- MHF 3404 - History of Mathematics
- MAP 5316 - Ordinary Differential Equations
- MAP 5326 - Partial Differential Equations

- MAT 5921 - Training in Mathematical Expositions
- MAP4401L - Lab for Advanced Differential Equations
- MAP3103L- Lab for Mathematical Modeling
- Complete set of notes for MAP 4401/5317
- Complete set of notes for MAA 6616
- A complete set of Labs for the QBIC Calculus I and Calculus II

### **Invited Lecturer at Mathematical Conferences**

1. *10<sup>th</sup> Workshop on Geometric Analysis of PDE and Several Complex Variables*, Serra Negra, SP, Brazil, August 2019
2. *11<sup>th</sup> ISAAC Congress (International Society for Analysis and its Applications)* Vaxjo, Sweden, August 2017
3. *9<sup>th</sup> Workshop on Geometric Analysis of PDE and Several Complex Variables*, Serra Negra, SP, Brazil, August 2017
4. *Analysis and Geometry in Several Complex Variables*, Doha, Qatar, January 2015
5. 1103<sup>rd</sup> AMS Meeting, San Francisco, October 2014
6. International Conference on Several Complex Variables, Wuhan China, May 2014
7. Salah Baouendi Memorial Conference, Mediterranean Institute for the Mathematical Sciences, Tunis, Tunisia, March 2014
8. *VII Workshop on Geometric Analysis of PDE and Several Complex Variables*, Serra Negra, Brazil, August 2013
9. RAMA 8 (8<sup>th</sup> Rencontre d'Analyse Mathematiques) Algiers, Algeria November 2012
10. *Complex Analysis and Partial Differential Equations*, Addis Ababa, Ethiopia, June 2012
11. Colloquium, USTHB (University of Algiers), Algeria, June 2011
12. *The  $d$ -bar Newmann Problem: Analysis, Geometry and Potential Theory*, The Schroedinger Institute, Vienna, Austria, December 2010
13. The 8<sup>th</sup> AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, Germany, May 2010
14. Colloquium, USTHB (University of Algiers), Algeria, June 2010
15. *International Workshop on Operator Theory and Applications (IWOTA 2009)*, Guanajuato, Mexico, September 2009
16. *Geometric Analysis of PDE and Several Complex Variables: V workshop*, Serra Negra, Brazil, August 2009
17. *Rencontre Mathematiques de l'Universite de Rouen: Complex Analysis and PDE*, Rouen, France, June 2009
18. *Geometric Analysis of PDE and Several Complex Variables: IV workshop*, Serra Negra, Brazil, August 2007
19. *International Conference in Honor of S. Baouendi*, Notre Dame University, Indiana, April 2007

20. *Geometric Analysis of PDE and Several Complex Variables: III workshop*, Serra Negra, Brazil, August 2005
21. *Celebration of the mathematics and 75 birthday of Francois Treves*, Rutgers University, NJ, April 05
22. *Geometric Analysis of PDE and Several Complex Variables: II workshop*, Serra Negra, Brazil, August 03
23. *Analysis Colloquium*, University of Wisconsin, Madison, March 2002
24. *Geometric Analysis of PDE and Several Complex Variables: I workshop*, Serra Negra, Brazil, August 2001
25. *Colloquium Federal University of Sao Carlos*, Sao Carlos, Brazil, July 2001
26. *Rencontre 2000 des mathematically Algériens*, Algiers, Algeria, May 2000
27. *Special Session of the AMS*, Notre Dame, Indiana, April 2000
28. *Forum on Mathematics in Africa*, ICTP Trieste, Italy, October 1999
29. *PDE and Complex Variables*, IMPA Rio de Janeiro, Brazil, July 1999
30. *Special Session of the AMS*, Philadelphia, PA, April 1998
31. *Meeting of the Math Society at FIU (MAA)*, March 1998
32. *Institute for Advanced Study, Analysis Seminar*, Princeton NJ, December 1997
33. *Analysis Seminar*, Temple University, Philadelphia, PA, December 1997
34. *Complex Analysis and its Applications*, Banach Center, Warsaw (Poland), July 1997
35. *Special Session of the AMS*, Memphis TN, March 1997
36. *Special Session of the AMS*, Orlando, FL, January 1996
37. *Gateway Engineering, Humanities & Science Seminar*, FIU, February 1996
38. *Multidimensional Complex Analysis and PDE*, Brazil-USA Conference, Sao Carlos, Brazil, July 1995
39. *Analysis Seminar*, Temple University, Philadelphia, PA, November 1994
40. *Special Session of the AMS*, Manhattan, Kansas, March 1994
41. *Meeting of the Math Society at FIU (MAA)*, October 1993
42. *Special Session of the AMS*, Philadelphia, PA, October 1991
43. *Rutgers University Analysis Seminar*, New Brunswick, NJ, February 1990
44. *Conference Lelong-Dolbeaut-Skoda*, Paris, France, April 1984

## **Publications**

### **Refereed Publications**

1. (joint work with P. Dattori) *A Gevrey differential complex on the Torus*, J. Fourier Analysis and Appl. 26 (2020), no. 1
2. (joint work G. Zugliani), *Class of hypocomplex structures on the two-dimensional torus*, Proc. Amer. Math. Soc. 147 (2019), no 9, 3937–3946.
3. *A class of planar hypocomplex vector fields: solvability and boundary value problems*, Mathematical analysis and applications—plenary lectures, 83–107, Springer Proc. Math. Stat., 262 (2018)

4. (joint work with C. Campana and P. Dattori) *A class of planar vector fields with homogeneous singular points: solvability and boundary value problems*. J. Differential Equations 265 (2018), n0.10, 5297–5314.
5. *Solvability of planar complex vector fields with homogeneous singularities*. Complex Var. Elliptic Equ. 62 (2017), no. 10, 1447–1473.
6. *Normalization and solvability of vector fields near trapped orbits*. Trans. Amer. Math. Soc. 369 (2017), no 5, 3325–3354.
7. (joint work with C. Campana and P. Dattori) *Properties of solutions of a class of hypocomplex vector fields*. Analysis and geometry in several complex variables, 29–50, Contemp. Math. Amer. Math. Soc., Providence, RI, 2017.
8. (Joint work with P. Dattori) *Cohomology relative to a system of closed forms on the torus*. Math. Nachr. 289 (2016), no. 17-18, 2147–2158.
9. (joint work with C. Campana) *Boundary value problems for a class of planar complex vector fields*. J. Differential Equations 261 (2016), no 10, 5609–5636.
10. (joint wor with C. Campana and P. Dattori) *Riemann-Hilbert problem for a class of hypocomplex vector fields*. Complex Var. Elliptic Equ. 61 (2016), no. 12, 1656–1667.
11. *Pseudoconvex Mizohata structures on compact manifolds*. Analysis and geometry, 241–266, Springer Proc. Math. Stat. 127 (2015).
12. (joint work with A. Ainouz and K. Boutarene) *The Riemann-Hilbert problem for elliptic vector fields with degeneracies*, Complex Var. Elliptic Equ. 59 (2014), no 6, 751-768
13. (joint work A.Bergamasco and P. Dattori) *Solvability of a first order differential operator on the two-torus*. J. Math. Anal. Appl. 416 (2014), no. 1, 166-180
14. *On the hypoellipticity of differential forms with isolated singularities*, Journal of Geometric Analysis, no. 3, 1236-1256 (2013)
15. *Nonrigidity of a class of two dimensional surfaces with positive curvature and planar points*, Proceedings of the Amer. Math. Soc. 141, no. 6, 2137-2143 (2013)
16. *Behavior of a class of Second-order Planar Elliptic Equations with Degeneracies*, In Recent Progress in Operator Theory and Its Applications, (Operator theory and applications),vol 220, 227-239, (2012), Birkhauser,
17. *On first and second order planar elliptic equations with degeneracies*, Memoirs of the Amer. Math. Soc. 217 (2012)
18. *Global solvability of real analytic complex vector fields in two variables*, J. Differential Equations, 251 No. 1, 2896-2931 (2011)
19. *On the hypoellipticity of differential forms with isolated singularities*, Journal of Geometric Analysis, December 2011, 1-21
20. *Solvability of planar vector fields with application to deformation of surfaces*, in Complex Analysis, several complex variables and connections with PDE Theory and geometry, Birkhauser (trends in mathematics series), 263-278, (2010)

21. (joint work with P. Dattori) *Properties of solutions of a class of planar elliptic operators with degeneracies*, Proceedings of the AMS, Vol. 139, No. 11, 3937-3949 (2011)
22. (joint work with V. Kravchenko) *On the two-dimensional stationary Schrödinger equation with a singular potential*, J. Math. Analysis and Appl. 377, no.1, 420-427 (2011)
23. *Properties of solutions of a planar second order elliptic equation with a singularity*, Complex Variables and Elliptic Equations, 54, no. 7, 677-688, (2009)
24. *Representation of solutions of a Cauchy-Riemann equation with a singularity*, Complex Variables, **53** (12), 1111-1130, (2008)
  
25. *Infinitesimal Bendings of High Orders for Homogeneous Surfaces with Positive Curvature and a Flat Point*, Journal of Differential Equations, 239, 16-37 (2007)
26. *Bending of Surfaces and Complex Vector Fields*, Contemporary Mathematics (AMS), 400, 189-202, (2006)
27. *Elliptic planar vector fields with degeneracies*, Transactions of the American Mathematical Society, **357**, 4225-4248 (2006)
28. *Geometric Analysis of PDE and Several Complex Variables*, volume 368 of the series *Contemporary Mathematics*, American Mathematical Society
29. *Solvability near the characteristic set for a class of planar vector fields of infinite type* (joint work with A. Bergamasco), Annales de l'Institut Fourier, **55**, 77-112 (2005)
30. *Representation of solutions of planar elliptic vector fields with degeneracies*, Contemporary Mathematics (AMS), **368**, 357-371 (2005)
31. *Infinitesimal bendings of homogeneous surfaces with nonnegative curvature*, Communications in Analysis and Geometry, **11**, 697-719 (2003)
32. *Generalized CR equations with a singularity*, Complex Variables, **48** (9), 739-752 (2003)
33. *Generalized CR equations with a punctual singularity: The model case*, Complex Variables, **48** (6), 495-512 (2003)
34. *Hypoellipticity of nonsingular closed 1-forms on compact manifolds*, Communications in PDE, **27**, 1255-1269 (2002)
35. *On planar elliptic structures with infinite type degeneracy*, Journal of Functional Analysis, **179**, 333-373, (2001)
36. *Semiglobal solvability of a class of vector fields of infinite type*, (joint work with A. Bergamasco) Mat. Contemp., **18**, 31-43, (2000) (Soc. Bra. Mat)
37. *On the similarity principle for planar vector fields: Applications to second order PDE*, Journal of Differential Equations, **157**, 1-19, (1999)
38. *On real analytic planar vector fields*, Contemporary Mathematics (AMS), **251**, 429-438, (2000)
39. *On the integrability of Mizohata structures on the sphere*, The Journal of Geometric Analysis, **9**, 301-315, (1999)
40. *Mizohata structures on the sphere: Automorphisms and standardness*, Contemporary Mathematics (AMS), **205**, 235-246, (1997)
41. *Global properties of a class of vector fields of infinite type*, (joint work with S. Berhanu) Communications in PDE, **22**, 99-142, (1997)

42. *The Mizohata Complex*, Transactions of the American Mathematical Society, **349**, 1029-1062, (1997)
43. *On rotationally invariant vector fields in the plane*, (joint work with S. Berhanu), Manuscripta Mathematica, **89**, 355-371, (1996)
44. *On the realizability of Lewy structures*, Proceedings of the American Mathematical Society, **124**, 2767-2772, (1996)
45. *Classification of germs of Mizohata structures*, Communications in PDE, **20**, 499-539, (1995)
46. *Perturbation of a class of CR structures of codimension larger than one*, Journal of Functional Analysis, **116**, 225-244, (1993)
47. *Topological Invariance of the solvability of complex-valued vector fields in the plane*, Duke Mathematical Journal, **71**, 609-628, (1993)
48. *Condition P for singular real analytic differential forms in the plane*, The Journal of Geometric Analysis, **2**, 157-182, (1992)
49. *Cohomology relative to the germ of an exact form*, Contemporary Mathematics (AMS), **140**, 157-182, (1992)
50. *On the integrals of singular real analytic differential forms*, Transactions of the American Mathematical Society, **321**, 583-594, (1990)
51. *On the integrability of singular differential forms in two complex variables*, Transactions of the American Mathematical Society, **321**, 595-620, (1990)
52. *Topological rationalization of a class of meromorphic functions*, Proceedings of the American Mathematical Society, **109**, 699-707, (1990)
53. *Perturbation des structures de Cauchy-Riemann*, Lecture Notes in Mathematics, Springer-Verlag, **1198**, 191-195, (1986)

#### **Papers Submitted for Publication**

- (Joint work A. Bergamasco and P. Dattori) *Solvability of a first order differential operator on the two-torus*
- *Solvability of vector fields with homogeneous singularities*

#### **Volumes Edited**

- *Geometric Analysis of PDE and Several Complex Variables*, Contemporary Mathematics (AMS), **368** (2005)
- *Geometric Analysis of Several Complex Variables and Related Topics*, Contemporary Mathematics (AMS), 550 (2011)

#### **Monograph**

- *On first and second order planar elliptic equations with degeneracies*, Memoirs of the Amer. Math. Soc. 217 (2012)

#### **Nonrefereed Publications**

- *Omar Khayyam*, Encyclopedia of Mathematicians, Publ. Marshal Cavendish, 403-406, (1998)



## Professional Society

- *American Mathematical Society* (member since 1984)
- *Algerian Mathematical Association* (member since 2000)

## Awards

- PI: US-Morocco Workshop on Geometric Analysis, NSF 2010-2014
- Co-PI of a Department of Education Grant *Student Equity and Achievement in Mathematics and Science*, \$300,000, Fall 05-Summer 08 (PI: G. Alacaci, Co-PI: L. Kramer )
- PI of NSF grant U.S.-Brazil Workshop on PDE and Complex Variables, July 2005,
- Summer support from DOE to visit and collaborate at Oak Ridge National Laboratory May-June 2004
- Co Principal Investigator, *Educational Innovations in Science, Engineering and Mathematics, with a Comprehensive Student Pipeline*, A multi-department award, ONR,
- Travel grants to participate in conferences: IMPA, Brazil (95, 99, 01, 03); Banach Center, Poland (97); Rencontre 2000, Algeria (00); ICTP, Italy (99).
- Outstanding Achievement and Performance Award, FIU, (1991).