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Employment

Assistant Professor, Texas A& M University San-Antonio, 2023 -
Faculty, Eastern Illinois University, USA 2021-2023
Research Associate, Imperial College London, UK, 2016 - 2019

Education

Ph.D. Mathematics, Washington University in St. Louis, USA, 2012-2016
Thesis title: *On the limiting behavior of variations of Hodge structures.*
Advisor: Matt Kerr
M.A. Mathematics, Washington University in St. Louis, USA, 2014
B.S. Mathematics, Universidade Federal do Piaui, Brazil, 2012
Major GPA: 9/10, finishing the 4 years degree in 3 years.

Research Interests

Complex Algebraic Geometry

I'm interested in Algebraic cycles and its connections. Topics include cycle class maps, normal functions, Hodge-D and Hodge conjectures, higher Chow groups, real regulators and related topics.

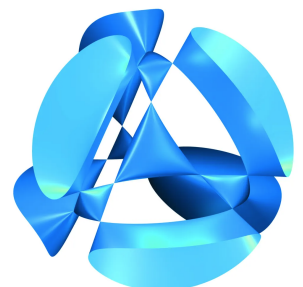
Analysis of Partial Differential Equations

I'm interested in non-linear Elliptic/Parabolic PDEs and free boundary problems. Topics include existence and regularity of solutions/free boundary

Publications

Journal Articles & Preprints

1. (with M. Kerr, G. Pearlstein) Arithmetic of degenerating principal variations of Hodge structure: examples arising from mirror symmetry and middle convolution.
Canadian J. Math. 68
2. On the arithmetic of Landau-Ginzburg model of a certain class of threefolds.
Communications in Number Theory and Physics Vol. 13, No. 1, 2019



3. Surfaces with exceptional monodromy.
Israel Journal of Mathematics, 2022
4. Notes on the Hodge conjecture for Fermat varieties
Experimental Results, Vol. 2, 2021
5. (with T. Coates, A. Corti) On the topology of Fano smoothings.
Interactions with Lattice Polytopes, Springer, 2022
6. (with James Lewis) The Chow Motive of a Fano Variety of k -planes
Communications in Algebra , 2023
7. (with James Lewis) The Complexity of Higher Chow Groups
Canadian Math. Bull. , 2023
8. (with James Lewis, Karim Mansour and Alex Ghitza) The Hodge- \mathcal{D} conjecture for a product of elliptic curves
Preprint – available online
9. Lyapunov Exponents for G_2 Variations of Hodge Structures
Preprint – available online
10. Known cases of the Hodge conjecture
Preprint – available online

Teaching Experience

College Algebra, Texas A&M, Fall 2023
Differential Equations, Eastern Illinois University, Spring 2023
Calculus I, Eastern Illinois University, Spring 2023
Finite Mathematics, Eastern Illinois University, Spring 2023
Brief Calculus, Eastern Illinois University, Fall 2022
College Algebra, Eastern Illinois University, Fall 2022
Mathematics: A Human Endeavor, Eastern Illinois University, Fall 2022
Calculus I, Eastern Illinois University, Spring 2022
College Algebra, Eastern Illinois University, Spring 2022
Mathematics: A Human Endeavor, Eastern Illinois University, Spring 2022
College Algebra, Eastern Illinois University, Fall 2021
Finite Mathematics, Eastern Illinois University, Fall 2021
Mathematics: A Human Endeavor, Eastern Illinois University, Fall 2021
Algebraic geometry, Imperial College London, Spring 2019
Smooth Manifolds, Imperial College London, Fall 2017
Calculus II, Washington University, Spring 2015
Calculus I, Washington University, Fall 2013
Calculus for Economics II , UFPI, Brazil, Spring 2012

Advising

Undergraduate Research Projects

James Lawrence (2018-2019), Imperial College London

Project: *The mirror map and its applications.*

Guillermo Ayuso (2018-2019), Imperial College London

Project: *Hodge theory applications in Mirror symmetry.*

Gabriel Kassayie (2018-2019), Imperial College London

Project: *Lefschetz theorem on algebraic cycles.*

Tanuj Gomez (2017-2018), Imperial College London

Project: *Complex Manifolds and Sheaf Cohomology.*

Selected Invited talks

"The Hodge Conjecture: a million dollar problem!", EIU Mathematics Colloquium, US.

"On the complexity of Higher Chow Groups", WUSTL Algebraic Geometry Seminar, US.

"Hodge Conjecture For Fermat Varieties", WUSTL Algebraic Geometry Seminar, US.

"On the geometry of Elliptic surfaces", Brazilian Algebraic Geometry Seminar.

"Surfaces with Exceptional monodromy", Cambridge-Oxford-Warwick seminar, UK.

"Mirror symmetry and CY variations", Nottingham, UK.

"On the arithmetic of Landau-Ginzburg models of a certain class of threefolds", Imperial College London, UK.

"Surfaces with Exceptional monodromy", FRG workshop, Stony Brook, US.

"LG-models, regulators and normal functions", Workshop on "Arithmetic and Geometry of Algebraic Varieties", Fields Institute, Toronto, Canada.

"Math circle", *Coloring graphs, part II*, Washington University, US.

"Math circle", *Coloring graphs*, Washington University, US.

"On the Hodge conjecture for Abelian varieties", Washington University, US.

"A survey of Monodromy", Undergraduate Colloquium, Universidade Federal do Piauí, Brazil.

"The Hopf-Fibration", Seminar, Universidade Federal do Piauí, Brazil.

"Yoneda's lemma", Seminar, Universidade Federal do Piauí, Brazil.

Awards & Grants

Student Academic Choice Award nomination for Best Teaching for Undergraduates, Imperial College, 2018

Washington University Graduate Fellowship, 2012-2016

Science without borders grant, around \$120.000, Brazilian National Science Foundation, 2012-2016

REUNI UROP grant, \$3600, Universidade Federal do Piaui, Brazil, 2012

Milenio Young scientist grant, IMPA, Brazil, 2009-2010

1st place out of >300 at B.S. Mathematics selection process, Universidade Federal do Piaui, 2008.

Computer Code

Algorithmic proof of the Hodge conjecture for Fermat varieties satisfying a numerical condition.

[Github]

Automated way of computing the Betti Numbers of Fano Toric 3-folds

[Github]

Graph after monodromy on the base space of a family of elliptic curves degenerating

[Github]

Programming languages

Advanced: **Python**, Sage, Magma

Familiar: Macaulay2, Maple, Javascript, C#

Languages

Native: Portuguese

Fluent: English, Spanish

Reading: French