

MICHAEL FRANCIS

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Ph.D., Mathematics	Pennsylvania State University	Summer 2021 (expected)
M.Sc., Mathematics	University of Victoria	2014
B.Sc. (Honours), Mathematics	University of Victoria	2011

RESEARCH INTERESTS

Operator algebras, smooth groupoids, foliations

RESEARCH ARTICLES

On certain singular foliations with finitely many leaves (in preparation).

The smooth algebra of a one-dimensional singular foliation (2020).

<https://arxiv.org/abs/2011.08422>

A Dixmier-Malliavin theorem for Lie groupoids (2020).

<https://arxiv.org/abs/2009.13760>

Subgraph-avoiding minimum decycling sets and k -conversion sets in graphs, Francis, M. D.; Mynhardt, C. M.; Wodlinger, J. L., Australas. J. Combin. 74 , 288–304, (2019).

https://ajc.maths.uq.edu.au/pdf/74/ajc_v74_p288.pdf

OTHER WRITINGS

Darboux's theorem and Euler-like vector fields (2018).

<http://personal.psu.edu/mjf5726/DarbouxEuler.pdf>

Introduction to C^ -algebra homology theories* (2018).

<http://personal.psu.edu/mjf5726/CstarHomology.pdf>

Linear Galois theory (2018)

<http://personal.psu.edu/mjf5726/LinearGaloisTheory.pdf>

A first look at geometric group theory (2017).

<http://personal.psu.edu/mjf5726/GeomGrpThry.pdf>

Traces, one-parameter flows and K -theory (M.Sc. Thesis, 2014).

<https://dspace.library.uvic.ca/handle/1828/5649>

Two topological uniqueness theorems for spaces of real numbers (2012).

<https://arxiv.org/abs/1210.1008>

ACADEMIC TALKS

- Tonight's entertainment: holonomy!* 2020
Rude Questions Seminar, Penn State University (Zoom)
- Around the Robertson-Seymour graph minor theorem* 2019
Student Directed Colloquium, Penn State University
- The Dixmier-Malliavin theorem and Lie groupoids* 2019
Noncommutative Geometry Seminar, Penn State University
- Groupoids and algebras of some singular foliations of the circle* 2018
Noncommutative Geometry Seminar, University of Victoria
- Cuntz's proof of Bott periodicity* 2018
K-Theory Learning Seminar, University of Victoria
- Étale groupoids and Cartan subalgebras* 2018
Seminar on UCT and Groupoids, Penn State University
- Groupoids and algebras of singular foliations with finitely many leaves* 2018
Workshop On Computability of K-Theory, Texas A&M University
- The Fejér kernel and the Kaplansky density theorem in operator algebras* 2017
von Neumann Algebra Learning Seminar, Penn State University
- The Betti numbers of a foliation* 2017
Student Geometric Functional Analysis Seminar, Penn State University
- The Group von Neumann algebra and comparison* 2017
von Neumann Algebra Learning Seminar, Penn State University
- Lifting projective representations, parts I and II* 2017
Operator Algebras and Physics Seminar, University of Victoria
- Introduction to harmonic analysis, parts I and II* 2017
Harmonic Analysis Seminar, University of Victoria
- A first look at geometric group theory* 2017
Graduate Student Seminar, Penn State University
- Lifting one-parameter automorphism groups* 2016
Student Geometric Functional Analysis Seminar, Penn State University
- Morita equivalence and imprimitivity theorems* 2015
Student Geometric Functional Analysis Seminar, Penn State University
- The irrational rotation algebra* 2015
Student Geometric Functional Analysis Seminar, Penn State University

<i>Geometry and numbers</i> CMS Math Camp, University of Victoria	2013
<i>M.F. Atiyah's "K-theory" book</i> Summer Graduate Workshop in Algebraic Topology, MSRI	2013
<i>The Bargmann-Wigner theorem and Connes' cocycle lemma</i> Operator Theory Seminar, University of Victoria	2012
<i>A map on odd K-theory induced by a KMS-state</i> Operator Theory Seminar, University of Victoria	2012
<i>Sierpiński's theorem on countable metrizable spaces</i> Graduate Seminar, University of Victoria	2011
<i>Topological uniqueness of the Cantor set</i> Canadian Undergraduate Mathematics Conference, University of Waterloo	2010
CONFERENCES AND SUMMER SCHOOLS	
Micro-Workshop on the Hypoelliptic Laplacian Pennsylvania State University, USA	2019
West Coast Operator Algebra Seminar Seattle University, USA	2018
Young Women in C*-Algebras & Young Mathematicians in C*-Algebras KU Leuven, Belgium	2018
Workshop on Computability of K-Theory for C*-Algebras Texas A&M University, USA	2018
Geometry and Physics XV Conference and Summer School Pennsylvania State University, USA	2017
Noncommutative Geometry: Index theory and its Ramifications in Geometry, Topology and Physics; State of the Art and Future Prospects Fudan University, China	2017
KK-Theory, Gauge Theory and Topological Phases School Lorentz Centre, Netherlands	2017
Cornell-Penn State Joint Symplectic Seminar Penn State University, USA	2017
Summer Graduate Workshop in Algebraic Topology Mathematical Sciences Research Institute, USA	2013

Spring Institute on Noncommutative Geometry and Operator Algebras: Index Theory and K-Theory Vanderbilt University, USA	2013
West Coast Operator Algebra Symposium University of Oregon, USA	2012
Summer School on Operator Algebras and Noncommutative Geometry University of Victoria, Canada	2010
Front Propagation in Heterogeneous Media: Mathematical, Numerical and Statistical Issues in Modeling a Forest Fire Front. Banff International Research Station, Canada	2010
MITACS/GEOIDE Summer School on Mathematical and Statistical Descriptions of Forest Fire Spread: Spatial Statistics and Level Set Methods Hinton Training Centre, Canada	2009
Workshop on Fire Spotting Fields Institute and University of Toronto, Canada	2009

SCHOLARSHIPS AND AWARDS

PhD

NSERC Postgraduate Scholarship (PGS-D)	2015-2018
Pennsylvania State University Teaching Assistantship	2015-Present
Robert W. and Ann M. Emery Endowed Scholarship	2019-2021
Jack and Eleanor Pettit Scholarship in Science	2018-2019

Masters

Univ. of Victoria Graduate Award	2011-2014
JJEM Graduate Award in Mathematics	2012

Undergraduate

NSERC Undergraduate Student Research Award (USRA)	2010
Univ. of Victoria President's Scholarship	2009-2010
Paul Smith Memorial Prize	2008-2010
Univ. of Victoria Faculty of Science Undergraduate Research Award (SURA)	2009
Bob Harrison Memorial Scholarship	2009-2010
Stephen A. Jennings Scholarship	2009-2010
Mark E. Mooney Memorial Scholarship	2008
Greater Victoria CUPE Entrance Scholarship	2008

Awards Declined:

Pennsylvania State University Graduate Fellowship	2015
University of Otago Doctoral Scholarship	2015

TEACHING

Sessional Lecturer:

Math 232 (Vector Calculus), 2 hours/week	Penn State University	Fall 2020
Math 230 (Vector Calculus), 4 hours/week	Penn State University	Fall 2020
Math 230 (Vector Calculus), 4 hours/week	Penn State University	Fall 2019
Math 230 (Vector Calculus), 8 hours/week	Penn State University	Spring 2019
Math 26 (Trigonometry), 6 hours/week	Penn State University	Fall 2018
Math 26 (Trigonometry), 3 hours/week	Penn State University	Fall 2017
Math 101 (Calculus 2), 3 hours/week	University of Victoria	Spring 2014

Tutorial Instructor:

Math 200 (Vector Calculus), 3 hours/week	University of Victoria	Fall 2013
Math 110 (Linear Algebra), 3 hours/week	University of Victoria	Fall 2013
Math 100 (Calculus 1), 5 hours/week	University of Victoria	Fall 2012
Math 100 (Calculus 1), 3 hours/week	University of Victoria	Fall 2011

Professional Development:

Graduate Teaching Seminar, 1 hour/week (directed by Dr. Aleksey Zelenberg)	Penn State University	Fall 2015
Math Teaching Workshop, 3 hours/week (directed by Dr. Alfonso Gracia-Saz)	University of Victoria, Learning and Teaching Centre	Summer 2012
Tutor	Camosun College, School of Access, MathLab	2014-2015
Tutor	University of Victoria, Math Assistance Centre	2008-2013
Grader (Calculus, Discrete Math, Galois Theory, Topology, Measure Theory)	University of Victoria	2009-2013
Tutor	University of Victoria, Resource Centre for Students with a Disability	2011-2012

OTHER WORK EXPERIENCE

Research Assistant (USRA, operator algebras)	University of Victoria	Summer 2010
Research Assistant (SURA, forest fire modeling)	University of Victoria	Summer 2009

OTHER ACTIVITIES

Co-Organizer: Climate and Diversity Workshop Penn State University	Fall 2017
Organizer: von Neumann Algebra Learning Seminar Penn State University, weekly	Fall 2017
Organizer: Student Geometric Functional Analysis Seminar Penn State University, weekly	Fall 2017
Explore: French Language Immersion Program École Internationale de Français de l'UQTR	Summer 2016

MISCELLANEOUS

Citizenship:
Canadian

Programming Experience:
Java, MATLAB, Maple, R, LaTeX