

# MICHAEL FRANCIS

Last Update: August 2018

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## EDUCATION

Ph.D., Mathematics	Pennsylvania State University	In progress
M.Sc., Mathematics	University of Victoria	2014
B.Sc. (Honours), Mathematics	University of Victoria	2011

## RESEARCH INTERESTS

Operator algebras, smooth groupoids, foliations

## SCHOLARSHIPS AND AWARDS

NSERC Postgraduate Scholarship (PGS-D)	2015-2018
Pennsylvania State University Teaching Assistantship	2015-Present
Univ. of Victoria Graduate Award	2011-2014
JJEM Graduate Award in Mathematics	2012
NSERC Undergraduate Student Research Award (USRA)	2010
Univ. of Victoria Faculty of Science Undergraduate Research Award (SURA)	2009
Paul Smith Memorial Prize	2008-2010
Bob Harrison Memorial Scholarship	2009-2010
Univ. of Victoria President's Scholarship	2009-2010
Stephen A. Jennings Scholarship	2009-2010
Mark E. Mooney Memorial Scholarship	2008
Greater Victoria CUPE Entrance Scholarship	2008

### *Awards Declined:*

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

## WRITINGS

*Subgraph-avoiding minimum decycling sets in regular graphs* (submitted) 2018  
With C.M. Mynhardt and J.L. Wodlinger

*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

*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 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

*Geometry and Numbers* 2013  
CMS Math Camp, University of Victoria

<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
<b>CONFERENCES AND SUMMER SCHOOLS</b>	
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

## 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

## TEACHING

### *Sessional Lecturer:*

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
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Math Teaching Workshop, 3 hours/week (directed by Dr. Alfonso Gracia-Saz)	University of Victoria, Learning and Teaching Centre	Summer 2012
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### **OTHER WORK EXPERIENCE**

Tutor	Camosun College, School of Access, MathLab	2014-2015
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Tutor	University of Victoria, Math Assistance Centre	2008-2013
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Grader (Calculus, Discrete Math, Galois Theory, Topology, Measure Theory)	University of Victoria	2009-2013
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Tutor	University of Victoria, Resource Centre for Students with a Disability	2011-2012
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Research Assistant (USRA, operator algebras)	University of Victoria	Summer 2010
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Research Assistant (SURA, forest fire modeling)	University of Victoria	Summer 2009
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### **MISCELLANEOUS**

*Citizenship:*  
Canadian

*Programming Experience:*  
Java, MATLAB, Maple, R, Latex