

Hisham Sati

Mathematics Program
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PERSONAL

Marital status: Married, 3 children.

Citizenship: USA.

EDUCATION

- 1999–2003 University of Michigan, Ann Arbor; PhD in Physics (*Theoretical/Mathematical*)
- Advisor in Physics: *Michael Duff, FRS*
- Thesis title: *Classical and quantum massive fields in Anti de Sitter space*
- Major graduate coursework and research in Mathematics.
- 1997–1999 Texas A&M University, College Station, TX; PhD precandidate in Physics
- 1995–1997 Louisiana Tech University, Ruston, LA; MS in Physics (*Theoretical Physics*)
- 1991–1995 American University of Beirut; BS in Physics.

ACADEMIC APPOINTMENTS

- 2017– Associate Professor of Mathematics, New York University Abu Dhabi (NYUAD).
- *Member, NYUAD Center for Astro, Particle and Planetary Physics (CAP3).*
- 2015–2017 Assistant Professor of Mathematics (*Tenure-track*), NYUAD.
- 2011–2017 Assistant Professor of Mathematics (*Tenure-track*), University of Pittsburgh.
- *Leave of absence 2015-2017*
- *Member of the graduate faculty*
- *Departmental Merit Evaluation: 1.25/1.25 every year*
- *Associate member, Pittsburgh Particle Physics, Astrophysics, & Cosmology Center.*
- 2009–2011 Visiting Assistant Professor of Mathematics, U. of Maryland, College Park.
- *Member of the graduate faculty.*
- 2006–2009 Gibbs Assistant Professor, Department of Mathematics, Yale University.
- 2003–2005 Research Associate, University of Adelaide & Australian National University.
- *Joint appointment in the Mathematics and Physics Departments.*

HONORS, AWARDS, AND ADDRESSES

- 12/2018 90 minute address, *String and M-Theory: The New Geometry of the 21st Century*, Singapore.
- 08/2018 90 minute address, *Symposium Higher Structures in M-Theory*, Durham, UK.
- 2016 *The J. Frank Adams Memorial Lecture* (Topology), Manchester, UK
- 2016– *Advisory board, Journal of Geometry, Topology, & Mathematical Physics (new)*
- 2010 *Junior Oberwolfach Fellowship*, Mathematisches Forschungsinstitut

	Oberwolfach (MFO), Germany
2006–2008	<i>Seggie Brown Fellowship</i> , University of Edinburgh, UK (declined)
2006	<i>Junior Research Fellowship</i> , Erwin Schrödinger Institute for Mathematical Physics, Vienna, Austria
2006	<i>Julian Schwinger Award</i> , Miami 2006 conference on High Energy Physics
2005–2006	<i>Honorary Visiting Research Fellow</i> , University of Adelaide, Australia
2001	<i>The First Behram N. Kursunoglu Prize</i> , Coral Gables Conference on High Energy Physics, Coral Gables, Florida
1991–1994	<i>Hariri Foundation Fellowship</i> , American University of Beirut.

AREA OF RESEARCH

Interdisciplinary Research Area: *Interactions between Mathematics and Physics.*

Fields: *Theoretical and Mathematical Physics, Differential Geometry, and Algebraic Topology.*

Research Focus: *Identification and construction of geometric and topological structures arising from quantum field theory, string theory, and M-theory.*

EXTENDED INTERNATIONAL RESEARCH ACTIVITIES

Summer 2019	Institute for Advanced Study/Park City Math Institute (PCMI), (<i>three weeks</i>)
Summer 2019	Aspen Center for Physics (ACP), Aspen, Colorado (<i>one month</i>)
Summer 2018	Center for Mathematical Sciences (ICMAT), Madrid, Spain (<i>three weeks</i>)
Summer 2016	Department of Mathematics, Lisbon University, Portugal (<i>one month</i>)
Summer 2016	Institut Henri Poincaré (IHP), Paris, France (<i>one month</i>)
Spring 2016	Rome University, La Sapienza, Italy (<i>one month</i>)
Spring 2013	Institut des Hautes Études Scientifiques (IHES), Paris, France (<i>one month</i>)
Summer 2012	Erwin Schrödinger Institute for Mathematical Physics, Vienna (<i>one month</i>)
Spring 2012	Isaac Newton Institute for Mathematical Sciences, Cambridge (<i>one month</i>)
Summer 2011	IHES, Bures-sur-Yvette, Paris, France (<i>two months</i>)
Winter 2011	The Australian National University, Canberra, Australia (<i>two weeks</i>)
Summer 2010	Max Planck Institute for Mathematics, Bonn, Germany (<i>two months</i>)
Spring 2009	Department of Mathematics, Hamburg University, Germany (<i>two weeks</i>)
Summer 2008	The Hausdorff Institute for Mathematics, Bonn, Germany (<i>three months</i>)
Spring 2006	Erwin Schrödinger Institute for Mathematical Physics, Vienna (<i>two months</i>)
Winter 2006	IHES, Bures-sur-Yvette, Paris, France (<i>one month</i>)
Winter 2006	Mathematical Science Research Institute (MSRI), Berkeley, CA (<i>one month</i>)
Winter 2006	Rutgers University, Mathematics Department, New Brunswick (<i>two weeks</i>)
Fall 2005	Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, New Brunswick (<i>seven weeks</i>)
Fall 2005	Kavli Institute for Theoretical Physics, Santa Barbara, CA (<i>one month</i>)
Fall 2005	Max Planck Institute for Mathematics, Bonn, Germany (<i>one month</i>)
Fall 2005	Theory Division, The European Organization for Nuclear Research (CERN),

Geneva, Switzerland (*one month*)
 2005–2006 The Australian National University, Canberra (*one year*)
 Fall 2004 Shanghai Institute for Advanced Studies, Shanghai, China (*one month*)
 Fall 2004 *Young String Theorists Program*, University of Michigan (*three weeks*)
 1999–2003 Research Assistant, Michigan Center for Theoretical Physics, Ann Arbor, MI
 Summer 1999 Research Assistant, Department of Physics, Texas A&M University, TX.

GRANTS

2019 NYUAD Research Institute funding for conference (\$42,000, PI)
 2018 NYUAD Research Institute funding for conference (\$15,000, PI)
 2017 Mathematics Research Center funding for 2nd workshop at Pitt (\$2000, PI)
 2017 Mathematics Research Center funding for 1st workshop at Pitt (\$4000, PI)
 2014–2016 Central Research Development Fund (CRDF) Grant (\$16,000, PI)
 2013 National Science Foundation (NSF) Conference Grant (\$5,000, PI)
 2013 NSF Travel Grant, PRIMA Conference, Shanghai (\$1,750)
 2013 Institute for Mathematics & its Applications (IMA) Conference Grant (\$5,000)
 2011–2014 NSF research grant PHY-1102218, Mathematical Physics (\$126,000, PI)
 2008–2011 American Institute for Mathematics (AIM) SQuaREs Program *Algebraic Topology and String Theory*; annual full support for 9 participants for 3 years
 2006–2009 Yale Office of the Provost Travel Grant (*four times*)
 2001 Rackham Travel Grant, University of Michigan, Ann Arbor, MI.

TEACHING

NYU Abu Dhabi:

2020 MATH-UH 1010: Foundations of Mathematics (*revised syllabus*)
 2019 MATH-UH 4610: Topology (*revised syllabus*)
 2019 CSTS-UH 1009: Theory of Everything (*Core*), twice, Spring and Fall
 2018 MATH-UH 3621: Differential Geometry (*new course*)
 2018 MATH-UH 4650: Directed Study in Mathematics
 2018 CSTS-UH 1009: Theory of Everything (*Core*)
 2018 MATH-UH 1009J: Integral Calculus (*Shanghai J-term*)
 2017 MATH-AD 110: Research Seminar in Mathematics (*Capstone*)
 2017 MATH-AD 110: Calculus (*proof-based*)
 2017 CORE-AD 065: Theory of Everything
 2017 MATH-AD 112: Multivariable Calculus
 2016 MATH-AD 111: Calculus with Applications (*Science and Engineering*)
 2016 MATH-AD 298: Directed Study in Mathematics
 2016 MATH-AD 400: Capstone Project in Mathematics
 2015 MATH-AD 110: Calculus (*proof-based*)

University of Pittsburgh:

2015 Math 413: Introduction to Theoretical Mathematics

- 2014 Math 240: Calculus III (*two sections*)
- 2014 Math 3761: Index Theory (*graduate topics course*)
- 2013 Math 450: Introduction to Analysis (*honors course*)
- 2013 Math 3760: Generalized Cohomology (*graduate topics course*)
- 2013 Math 2801: Differential Geometry II (*graduate course*)
- 2012 Math 2800: Differential Geometry I (*graduate course*)
- 2012 Math 420: Introduction to the Theory of 1-Variable Calculus
- 2012 Math 2900: Partial Differential Equations I (*graduate course*)
- 2011 Math 220: Analytic Geometry and Calculus I

University of Maryland, College Park:

- 2011 Math 498A: Individual Studies
- 2011 Math 411: Advanced Calculus II
- 2010 Math 111: Introduction to Probability
- 2010 Math 410: Advanced Calculus I
- 2010 Math 406: Number Theory
- 2009 Math 410: Advanced Calculus I

Yale University:

- 2009 Math 112: Calculus of Functions of One Variable
- 2009 Math 545b: Algebraic Topology II (*graduate course*)
- 2008 Math 230: Vector Calculus and Linear Algebra (*year-long rigorous course*)
- 2007 Math 230: Vector Calculus and Linear Algebra
- 2007 Math 921: Instantons, Monopoles, and Duality (*graduate topics course*)
- 2007 Math 246: Ordinary Differential Equations
- 2006 Math 917: Conformal Field Theory (*graduate topics course*)
- 2006 Math 222: Linear Algebra and Applications

The Australian National University:

- 2006 Relativistic Quantum Field Theory (*honors course*)
- 2005 Relativistic Quantum Mechanics (*honors course*)

Shanghai Institute for Advanced Study:

- 2004 Anomalies, Index Theory and K-Theory (*graduate course for university credit*).

CREATING COURSES AND DEVELOPING SYLLABI

All courses come with new syllabi and complete sets of lecture notes.

Graduate Courses:

- Yale Math Two new courses: *Conformal Field Theory* and *Instantons, Monopoles, & Duality*
- Pitt Math Two new courses: *Generalized Cohomology* and *Index Theory*
- Pitt Math Two new syllabi: *Differential Geometry I* and *Differential Geometry II*.

Undergraduate Courses:

- NYUAD Designed new plan and syllabus for *Calculus with Applications* and co-designed a new hybrid *Differential and Integral Calculus*.
- NYUAD Created new course: *Differential geometry*
- NYUAD Created new plan and syllabus for *Topology*.
- NYUAD Created new plan and syllabus for *Foundations of Mathematics*.
- NYUAD Proposed and created a new course *Lie groups and Lie algebras*.

ADVISING PHD STUDENTS

<https://www.genealogy.math.ndsu.nodak.edu/id.php?id=80303>

1. Hyung-bo Shim, University of Pittsburgh, PhD in Mathematics, graduated 2013.
Thesis title: *Indefinite String Structures*.
2. Daniel Grady, University of Pittsburgh, PhD in Mathematics, graduated 2015.
Thesis title: *Massey products in differential cohomology*.
3. Matthew Wheeler, University of Pittsburgh, PhD in Mathematics, graduated 2016.
Thesis title: *Rational structures and fractional differential refinements*.
4. Alexandra Yarosh, University of Pittsburgh, PhD in Mathematics, graduated 2017.
Thesis title: *Computations in twisted Morava K-theory*.

GRADUATE THESIS COMMITTEES

- 2019 PhD Dissertation Committee, Johnny Lim, University of Adelaide, Australia
- 2018 Masters Thesis Committee, Atiqa Naeem Ahmed, Bahrain University
- 2016 PhD Dissertation Committee, Alessandra Capotosti, Math, La Sapienza Rome
- 2016 PhD Dissertation Committee, Junmou Chen, Physics, U. Pittsburgh
- 2014 Masters Thesis Committee, Daniel Gomez, Mathematics, U. Pittsburgh
- 2014 Masters Thesis Committee, Lauren Hennings, Mathematics, U. Pittsburgh
- 2014 PhD Dissertation Committee, Takuya Murata, Mathematics, U. Pittsburgh
- 2013 PhD Dissertation Committee, Chris Kapulkin, Mathematics, U. Pittsburgh
- 2011 PhD Dissertation Committee, Jonathan Holland, Mathematics, U. Pittsburgh
- 2010 PhD Dissertation Committee, Stefan Mendez-Diez, Mathematics, Maryland.

UNDERGRADUATE MENTORSHIP

- 2019 High School Summer Research with Sara Ansari,
Project title: *Mathematics of the standard model of elementary particles*.
- 2019 Undergraduate Summer Research with Faiq Raees, NYUAD
Project title: *Symplectic vector bundles*.
- 2019 Undergraduate Summer Research with Alonso Lona, NYUAD
Project title: *Chern-Simons classes*.
- 2018-2019 Capstone mentor for Nada Wardi, NYUAD
Project title: *Topology and Economics*.

- 2018-2019 Capstone mentor for Nischal Mainali, NYUAD
Project title: *Mod 2 characteristic classes*.
- 2018 Undergraduate Research (Directed Study), Silviu-Marian Udrescu, NYUAD,
Computations in characteristic classes II.
- 2016-2017 Capstone mentor for Erika Zogla, NYUAD
Project title: *Computations in characteristic classes I*.
- 2010 Undergraduate Summer Research, Jacob Warren, *Elliptic Curves*, UMD.
- 2010 Undergraduate Summer Research, Srinivas Vasudevan, *Modular Forms*, UMD.
- 2009-2011 Undergraduate Mathematics Faculty Advisor, University of Maryland, College Park; advised tens of students with major in Math.
- 2009 Undergraduate Summer Research Mentor, Yale, sophomore Chang Mou Lim
– Topic: *Elliptic Curves and Elliptic Genera*.
– Student won Lewis Prize for Mathematics.
– Student got PhD in Math from the University of Chicago.
- 2009 Program Leader, Research Experience for Undergraduates (REU), Yale,
– Topic: *Nonlinear Algebra and Hyperdeterminants*.
– Led to a journal publication with two freshmen and one sophomore.
– One student, D. Thompson, currently Math graduate student at MIT.
- 2008 Co-organizer of the *Barge and Runk Mathematics Competition*, Yale University
- 2008-2009 *Yale College Sophomore Faculty Adviser* for over hundred undergraduates
- 2007-2009 *Yale College Freshman Faculty Adviser* for over hundred undergraduates
- 2006-2009 *Fellow of Morse College*, Yale University, New Haven, CT
- 2002 Mentor for *Michigan Mentorship Program*, University of Michigan, Ann Arbor.

DEPARTMENTAL/UNIVERSITY COMMITTEE & SERVICE

At NYUAD:

- 2019 Reviewer, science grant applications *Research Enhancement Fund (REF)*, NYUAD.
- 2018-2019 Chair, *Math Hiring Committee* (for junior and senior faculty)
- 2018 Member, *Scientific Committee, 2018 NYUAD Research Conference*
- 2017 Member, *Math Curriculum Committee*
- 2017 Member, *Math Library Committee*
- 2017-2019 Math Representative, *Undergraduate Research Funding Sub-committee*
- 2016-2019 Candidate weekend interviewer for 1-1 conversations (10 times).

At the University of Pittsburgh, Mathematics Department:

- 2016 Member, *Mathematics Research Center Postdoc Position Search Committee*
- 2014 Member, *Mathematics Research Center Postdoc Position Search Committee*
- 2013-2015 Member, *Graduate Committee*
- 2013 Member, *Algebra Tenure-track Position Search Committee*
- 2012 Member, *Algebra Postdoc Position Search Committee*.

At the University of Maryland

- 2010-2011 Faculty member, *Student Affairs Senate Committee*

As a student at the University of Michigan

- 2001–2003 Representative, *Michigan Student Assembly*
2001–2003 Representative, *Rackham (Graduate) Student Government*,
(actively participated in many leadership and diversity programs).

Other activities as a student and postdoc

- 2003–2004 Manager and Captain of MH intramural soccer team, U. of Adelaide, Australia
(*won university championship*)
2002–2003 Manager and Captain of Physics intramural soccer team, U. of Michigan
(*won university intramurals*)

MEMBERSHIPS

- American Mathematical Society (*lifetime member*)
- American Physical Society (*lifetime member*)
- International Association of Mathematical Physics.

EDITORIAL ACTIVITIES

- 2016– *Invited member of the Advisory Board, Journal of Geometry, Topology, and Mathematical Physics* (launched in 2017)
2015 *Invited editor, The Graduate Journal of Mathematics* (launched in 2017)
2012– *Invited editor, Journal of Modern Physics*
2010 *Co-editor of Proc. Symp. Pure Math. volume Mathematical Foundations of Quantum Field and Perturbative String Theory, American Mathematical Society 2011*
2007– *Invited editor, Advanced Studies in Theoretical Physics.*

ORGANIZATION OF SCIENTIFIC MEETINGS

At NYUAD:

- 2020 Organizer, Workshop *Super Physmatics III*,
2020 Organizer, Workshop *Geometry, Topology & Physics III*,
2020 Organizer, NYUAD Research Institute Conference *M-theory and Mathematics*,
2019 Co-organizer, Workshop *Super Physmatics II*, May 3
2018 Organizer, Research Institute Regional Collaborative Conference *Geometry, Topology & Physics at NYUAD II*
2018 Organizer, Workshop *Geometry, Topology & Physics I*,
2018 Organizer, Workshop *Super Physmatics I*,
2017 Organizer, Mini-Workshop *Higher Structures in Geometry, Topology & Physics*,
2016 Scientific Committee, *UAE Math Day*, March 12.

At the University of Pittsburgh:

- 2017 Organizer, *Cohomology Theories, Categories, & Appl.* Workshop, March 25-26,
2015 Lead Organizer, Spring Semester Program on *Applications of Category Theory*,
2015 Organizer, *Spring School on Differential and Generalized Cohomology*, May 2015,
2015 Co-organizer, *Workshop on Moduli Spaces*, April 11,

- 2015 Organizer, *Higher Structures and Cohomology Theories Workshop*, March 28–29,
 2014 Organizer (with J. DeBlois), *Geometry, Topology & Physics Workshop*, May 14-15,
 2013 Organizer (with M. Stieneau and P. Xu), *GAP Summer School*, Aug. 19-23,
 2013 Organizer (with Jason DeBlois), *Chern-Simons Theory Workshop*, May 4-6,
 2012 Co-organizer, *Topology/Geometry + Physics Workshop*, June 28-29,
 2012 Organizer, *Topology/Geometry + Analysis Workshop*, March 16-17.

At other venues:

- 2019 Scientific Committee, *2nd International Sharjah Spring school in Mathematics*,
 March 24-25, 2019
 2018 Organizing Committee, Program: *String and M-Theory: The New Geometry of the
 21st Century*, Singapore, Dec. 9-14, 2018
 2018 Co-Organizer, *New Trends in Topology and Geometry, Tunisia, July 4-6, 2018*
 2008–2010 Organizer of **three** annual American Institute of Mathematics (AIM) SQuaREs
 Programs: *Algebraic Topology and String Theory*
 2000 Organizer, Poster Session, *Strings 2000 Conference*, July 10–15, Ann Arbor, MI.

ORGANIZATION OF SEMINARS AND COLLOQUA

- 2018– Organizer, *Geometry, Topology and Physics Seminar*, NYUAD
 2012–2017 Organizer (with Jason DeBlois), *Geometry, Topology and Physics Seminar*
 2010 Organizer (with Jonathan Rosenberg) of Research Interactions in Teams (mostly
graduate students) on *Geometry and Physics*, University of Maryland
<http://www-users.math.umd.edu/~jmr/geomphysRIT.html>
 2008–2009 *Colloquium Chair*, Mathematics Department, Yale University
 2007–2008 Organizer of *Geometry, Symmetry and Physics Seminar*, Yale University
 1999–2003 Organizer, *Graduate Geometry and Physics Seminar*, University of Michigan.

EXTERNAL REVIEW

- 2014 External Reviewer, *Tenure case*, US Math Department (Geometry/Topology)
 2013– External Reviewer, King Fahd University of Petroleum & Minerals, Saudi Arabia
 2005– Referee for journals and series:
 – *Contemporary Mathematics*, AMS,
 – *Journal of the London Mathematical Society*,
 – *Physics Letters B*,
 – *Birkhäuser Progress in Mathematics series*,
 – *Proceedings of Symposia in Pure Mathematics*,
 – *Advances in Mathematics*,
 – *Journal of Pure and Applied Algebra*,
 – *Communications in Mathematical Physics*,
 – *Journal of High Energy Physics*,
 – *Journal of Mathematical Physics*,
 – *Journal of Geometry and Physics*,
 – *Symmetry and Integrability Geometric Methods and Applications (SIGMA)*,
 – *Advances in Theoretical and Mathematical Physics*.
- 2002– Reviewer for *Mathematical Reviews*, American Math Society (55 reviews).

LOCAL AND INVITED EXPOSITORY LECTURE (SERIES)

Summer 2018	<i>Twisted generalized cohomology and applications</i> , lectures at MIMS Summer school: New Trends in Topology and Geometry, Tunisia
Spring 2014	<i>Twisted spectra and twisted topological structures</i> , Pittsburgh (2 lectures)
Fall 2013	<i>Topological Quantum Field Theories & higher categories</i> , Pittsburgh (2 lectures)
August 2013	<i>Higher categories via geometry and topology</i> , Pittsburgh (6 hours)
Spring 2013	<i>Topology of Lie groups</i> , Pittsburgh (2 lectures)
Winter 2011	<i>Higher Spin structures in quantum gravity</i> , IST, Lisbon (2 lectures)
Fall 2010	<i>Supersymmetric Yang-Mills Theory</i> , University of Maryland, College Park
Fall 2007 07/2007	<i>Quantum Field Theory</i> , Infinite-Dimensional Algebraic Geom. Seminar, Yale In <i>The Geometric Langlands Conjecture</i> , Canberra, Australia (2 lectures)
Fall 2006	<i>Gauge theory and the Geometric Langlands Program</i> , Lectures, Yale
Winter 05	<i>Differential cohomology</i> , Journal Club Series, Canberra, Australia (2 lectures)
Fall 2005	<i>Membranes and automorphic forms</i> , Invited Lectures, Yale
Fall 2005 05/2005	<i>Generalized complex geometry</i> , Journal Club Series, Canberra, Australia In <i>Groups and Algebras in M-theory</i> workshop (3 lectures), Rutgers University
2003-2004	<i>String theory for mathematicians</i> , Adelaide, Australia (15 lectures)
Winter 01 2000-2002	<i>String Theory and Calabi-Yau manifolds</i> , University of Michigan (4 lectures) <i>Geometry and Physics graduate seminar</i> , University of Michigan (6 lectures).

INVITED CONFERENCE LECTURES

06/2019	<i>Index Theory, Duality and Related Fields</i> Chern Institute, Tianjin, China.
05/2019	<i>International Symposium on Wen-Tsun Wu's Academic Thought</i> , Beijing.
03/2019	<i>UAE Math Day</i> , American University of Sharjah.
12/2018	<i>String and M-Theory: The New Geometry of the 21st Century</i> , Singapore.
08/2018	<i>Symposium Higher Structures in M-Theory</i> , Durham, UK.
04/2018	<i>Workshop Geometry, Topology & Physics</i> , NYUAD, Abu Dhabi, UAE.
04/2018	<i>Workshop Super Physicsmatics I</i> , NYUAD, Abu Dhabi, UAE.
08/2017	<i>Mini-symposium on Lie superalgebras</i> , Ghent, Belgium.
04/2017	<i>Interdisciplinary Workshop on the Mathematics & Philosophy of Physics</i> , NYUAD.
04/2017	<i>Mini-Workshop Higher Structures in Geometry, Topology & Physics</i> , NYUAD.
10/2016	<i>American Mathematical Society Sectional Meeting</i> , Minneapolis
09/2016	<i>Transpennine Topology Tirangle</i> , Manchester, UK
08/2016	<i>Singular spaces in M-theory and string theory</i> , Fields Institute, Toronto
02/2016	<i>Colloquium on Geometry and Mathematical Physics</i> , NYUAD
12/2015	<i>Higher structures in string theory and quantum field theory</i> , ESI, Vienna
06/2015	<i>AMS Joint International Meeting</i> , Porto, Portugal
08/2014	<i>CUNY workshop on differential cohomologies</i> , New York
07/2014	<i>String Geometry and Loop Spaces</i> , Greifswald, Germany

10/2013 *Twisted Cohomology*, Münster, Germany
07/2013 *Mathematics of String Theory*, Hangzhou, China
06/2013 *Mathematics of String Theory*, PRIMA Congress, Shanghai, China
01/2012 *Mathematical Aspects of String and M-theory*, Newton Institute, Cambridge
11/2011 *Mathematical Methods in General Relativity*, Pittsburgh
02/2011 *Higher Gauge Theory, TQFT and Quantum Gravity*, Lisbon, Portugal
06/2010 *Geometry, Quantum Fields, and Strings*, Oberwolfach, Germany
05/2009 *Topology, C^* -Algebras, and String Duality*, Fort Worth, TX
04/2009 *Homotopical Algebra with Applications to Mathematical Physics*, Raleigh, NC
12/2008 *Miami 2008: High Energy Physics*, Fort Lauderdale, FL
10/2008 *Topology session, AMS regional conference*, Middletown, CT
12/2006 *Miami 2006: High Energy Physics*, Fort Lauderdale, FL
05/2006 *Gerbes, Groupoids and Quantum Field Theory*, ESI, Vienna, Austria
08/2005 *Gerbes, Twisted K-theory & Conformal Field Theory*, Oberwolfach, Germany
12/2004 *Mathematical Physics and Lie Theory*, Brisbane, Australia
10/2004 *Noncommutative Geometry and String Theory*, Adelaide, Australia
03/2004 *Strings and Mathematics 2004*, Adelaide, Australia
12/2003 *High Energy Physics & Cosmology*, Coral Gables, FL
05/2003 *Strings and Mathematics 2003* (2 talks), Adelaide, Australia
12/2001 *High Energy Physics & Cosmology*, Coral Gables, FL (Kursunoglu Prize).

INVITED SEMINARS

05/2018 *CAMS Seminar*, American University of Beirut, Lebanon
05/2018 *Differential Geometry Seminar*, ICMAT, Madrid, Spain
06/2018 *Algebra, Geometry, and Topology Seminar*, University of Malaga, Spain
06/2016 *Topological Quantum Field Theory Seminar*, Lisbon University (2 separate talks)
04/2016 *Geometry Seminar*, University of Rome 3, La Sapienza, Italy
02/2015 *Geometric Analysis and Topology Seminar*, Courant Institute, New York
12/2014 *Mathematics Seminar*, New York University Abu Dhabi, UAE
12/2014 *Mathematics Seminar*, American University of Sharjah, UAE
03/2014 *Algebra Seminar*, Temple University, Philadelphia
12/2013 *Center for Advanced Mathematical Sciences Seminar*, American U. of Beirut
12/2013 *Colloquium*, Notre Dame University, Lebanon
08/2012 *Center for Advanced Mathematical Sciences Seminar*, American U. of Beirut
03/2012 *Laboratory for Axiomatics Seminar*, University of Pittsburgh
11/2011 *Laboratory for Axiomatics Seminar*, University of Pittsburgh
10/2011 *Geometry Seminar*, Pennsylvania State University, State College, PA
10/2011 *Algebra, Geometry & Combinatorics Seminar*, University of Pittsburgh (twice)
02/2011 *Topology Seminar*, University of Illinois at Urbana-Champaign, IL

01/2011 *Mathematics Colloquium*, University of Pittsburgh

01/2011 *Topology and Geometry Seminar*, National University of Singapore

01/2011 *Mathematics Colloquium*, The Australian National University, Canberra

11/2010 *Mathematics Colloquium*, Rutgers University, New Brunswick

10/2010 *Geometry and Topology Seminar*, University of Southern California, CA

07/2010 *Topology Seminar*, Max Planck Institute for Mathematics, Bonn, Germany

02/2010 *Algebra/Number Theory Seminar*, University of Maryland, College Park

02/2010 *Differential Geometry Seminar*, University of Notre Dame, IN

10/2009 *Geometry/Topology Seminar*, University of Maryland, College Park

06/2009 *Special Geometry/Topology Seminar*, University of Maryland, College Park

06/2009 *Special Colloquium*, University of Sheffield, UK

05/2009 *Topology Seminar*, University of Copenhagen, Denmark

10/2008 *Deformation Theory Seminar*, University of Pennsylvania, Philadelphia, PA

10/2008 *Geometry and Physics Seminar*, University of Michigan, Ann Arbor

04/2007 *Topology Seminar*, Wesleyan University, Middletown, CT

03/2007 *BCDE Seminar*, University of Illinois at Urbana-Champaign, IL

10/2006 *Geometry, Symmetry, and Physics Seminar*, Yale University, New Haven

05/2006 *String Theory Seminar*, LPTENS, École Normale Supérieure, Paris, France

04/2006 *String Theory Seminar*, CPHT, École Polytechnique, Paris, France

04/2006 *CAMS Seminar*, American University of Beirut, Lebanon

12/2005 *Algebra/Quantum Mathematics Seminar*, Rutgers University, NJ

11/2005 *Elementary Particle Theory seminar*, University of Maryland, College Park

11/2005 *Differential Geometry Seminar*, University of California Santa Barbara, CA

11/2005 *Theoretical High Energy Physics seminar*, University of Southern California,

11/2005 *Theoretical Elementary Particle Physics seminar*, UCLA, Los Angeles, CA

10/2005 *Gauge Theory Seminar*, Max Planck Institute for Mathematics, Bonn

10/2005 *String Theory Seminar*, Theory Division, CERN, Geneva, Switzerland

09/2005 *String Theory Seminar*, Duke University/University of North Carolina, NC

05/2005 *High Energy Theory Seminar*, Caltech, Los Angeles, CA

05/2005 *Theory Group Seminar*, Enrico Fermi Institute, University of Chicago

05/2005 *High Energy Theory Seminar*, MCTP, University of Michigan, Ann Arbor

02/2005 *Geometry and String Theory Seminar*, University of Texas at Austin, TX

02/2005 *Math/Physics Research Group Seminar*, University of Pennsylvania, PA

02/2005 *BCDE seminar*, University of Illinois at Urbana-Champaign, IL

11/2004 *Differential Geometry Seminar*, Fudan University, Shanghai, China

11/2004 *Physics Colloquium*, University of Science and Technology of China, Hefei.

PUBLICATIONS

ResearchGate Profile
Papers on Inspire database
Scopus Profile

Google Scholar Profile
Papers on Mathematical Reviews
E-prints on arXiv

Authors appear in alphabetical order, and collaborative publications contain equal contributions from each author.

(i) Refereed Research Publications

1. *Twisted Morava K-theory and connected covers of Lie groups*, (with Aliaksandra Yarosh), conditionally accepted in Algebraic and Geometric Topology, [arXiv:1711.05389] [math.AT].
2. *A higher categorical analogue of T-duality for sphere bundles* (with John Lind and Craig Westerland), accepted in Annals of K-theory, [arXiv:1601.06285] [math.AT].
3. *Gauge enhancement of super M-branes via parametrized stable homotopy theory* (with Vincent Braunack-Mayer and Urs Schreiber), Communications in Mathematical Physics 2019, pp. 1-69, DOI: 10.1007/s00220-019-03441-4, [arXiv:1806.01115] [hep-th].
4. *Real ADE-equivariant (co)homotopy and Super M-branes* (with John Huerta and Urs Schreiber), Communications in Mathematical Physics 2019, pp. 1-100, DOI:10.1007/s00220-019-03442-3, [arXiv:1805.05987] [hep-th].
5. *The Rational Higher Structure of M-theory*, (with Domenico Fiorenza and Urs Schreiber), Fortschritte der Physik, May 2019, DOI:10.1002/prop.201910017
6. *Twisted differential generalized cohomology theories and their Atiyah-Hirzebruch spectral sequence* (with Daniel Grady), accepted in Algebraic and Geometric Topology 2019 [arXiv:1711.06650] [math.AT].
7. *String structures associated to indefinite Lie groups*, (with Hyung-bo Shim), J. Geometry and Physics **140** (2019) 246-264, DOI: 10.1016/j.geomphys.2019.02.002, [arXiv:1504.02088].
8. *Topological actions via gauge variations of higher structures* (with Matthew Wheeler), Phys. Lett. **B 789** (2019), 114-118, arXiv:1810.05349.
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70. *Twisted Cohomotopy implies level quantization of the full 6d Wess-Zumino term of the M5-brane*, (with Domenico Fiorenza and Urs Schreiber), 21 pages, [arXiv:1906.07417] [hep-th]
71. *Twisted differential KO-theory*, (with Daniel Grady), 34 pages, [arXiv:1905.09085] [math.AT]
72. *Twisted Cohomotopy implies M-Theory anomaly cancellation*, (with Domenico Fiorenza and Urs Schreiber), 63 pages, [arXiv:1904.10207] [hep-th]
73. *Ramond-Ramond fields and twisted differential K-theory* (with Daniel Grady), 41 pages, [arXiv:1903.08843] [hep-th]
74. *The image of the Burnside ring in the Representation ring for binary Platonic groups*, (with Simon Burton and Urs Schreiber), 44 pages, [arXiv:1812.09679] [math.RT].
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76. *Higher T-duality of super M-branes*, (with Domenico Fiorenza and Urs Schreiber), 56 pages, [arXiv:1803.05634] [hep-th].
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