Curriculum Vitae of RUTH LAWRENCE
Summer 2016
BIOGRAPHICAL SKETCH

General

> Born: August 2, 1971   Place: Brighton, UK
>
> Marital status: Married, +4 (ages 10,12,15,16)

Education

1989	D.Phil. University of Oxford (Thesis advisor: M.F. Atiyah)
1986	B.A. Class I (Physics) University of Oxford
1985	B.A. Class I with special commendation (Mathematics) University of Oxford

Academic Appointments

2001—	Associate Professor with tenure (Hebrew University)
1999–2001	Associate Professor without tenure (Hebrew University)
1997–2001	Associate Professor with tenure (University of Michigan, Ann Arbor)
1993–1997	Assistant Professor (University of Michigan, Ann Arbor)
1990–1993	Junior Fellow, Society of Fellows (Harvard University)
1989–1990	Lindemann Fellow of the English Speaking Union (held at Harvard)

Fellowships and Awards

2012	Fellow of American Mathematical Society
2002–2004	Host of Marie Curie Fellow, Florian Deloup, awarded by European Commission
2000–2003	Joint Principal Investigator, BSF grant 9800119 with D. Bar-Natan, M. Hutchings, V. Jones, L. Rozansky
1999–2002	Guastella Fellowship, held at Hebrew University
1997–2000	Faculty Recognition Award (Michigan)
1997	LS&A Excellence in Education Award, University of Michigan College of Literature, Science & Arts
1996–1998	Principal Investigator, NSF grant DMS-9626544 "Holomorphic invariants of 3-manifolds"
1995–1999	Alfred P. Sloan Foundation Research Fellow
1994–1995	Raymond and Beverley Sackler Fellow Institut des Hautes Études Sciéntifique, FRANCE
1994–1997	Faculty Recognition Award (Michigan)
1990–1993	Principal Investigator, NSF grant DMS-9013738 "Topological Knot Theoretic Connections"
1990–1993	Junior Fellowship of the Society of Fellows (Harvard)

1989–1990   Lindemann Research Fellowship (held at Harvard)

Professional responsibilities

— Undergraduate Advisor, Mathematics, Hebrew University 2016–.

— Mathematics representative in Hebrew University International Forum, 2015.

— Member of Appointments Committee, Department of Mathematics, Hebrew University, 2013.

— Member of Teaching Committee, Mathematics, Hebrew University 2008–2016.

— Vice Chair/Director of Studies, Einstein Institute of Mathematics, Hebrew University 2010–2013.

— Member of National Science Foundation panel, USA 2006,2007,2009,2010,2012.

— Member of Scientific Committee for conference "Knots in Poland", summer 2010

— Elected Member of Senate, Hebrew University 2006-2009

— External member of Appointments Committee, Department of Statistics, Hebrew University, 2008,2013

— Member of expert committee/written report for promotion cases in Technion (2), University of North Carolina (2), University of South Florida (1), UCSB (1), Bar Ilan (1)

— Co-chair of organising committee for a conference on "Algebraic Aspects of Quantum Field Theory" held at MSRI Dec 4-8, 2000.

— Associate Editor of 'Journal for Knot Theory and its Ramifications', World Scientific Publishing 1992+.

— Refereed some 62 papers for various assorted other Journals such as 'Topology', 'Commun. Math. Phys.', 'Inventiones', 'Crelle's Journal', 'J. Funct. Analysis', 'Duke Math. J.', 'Canadian Mathematical Bulletin', 'Compositio'.

— Reviewed (outside panels) over 27 grant applications for NSF, NSA, NRC, GIF, BSF, ISF.

— Written published reviews of books and papers for *Mathematical Gazette* and *La Gazette des Mathematicien*.

— Regular reviewer for *Mathematical Reviews* and *Zentralblatt*, including two featured reviews for *Mathematical Reviews*.

— Organised weekly 'Knot Theory' seminar with visitors 1995+ at UM.

— Undergraduate Counsellor 1993/4, 1995/6, 1996/7, Fall 1999 in UM.

— Faculty Advisor to Undergraduate Mathematical Society UM Fall 1998 and Fall 1999.

— Colloquium Chair Fall 1998, Fall 1999 in UM; 2000-2007 in Hebrew University.

— Member of Executive Committee of UM Department of Mathematics 1996/7.

— KCP host during Winter '96: contact with groups from public schools in Detroit.

PUBLICATIONS

Articles in journals and proceedings volumes

[1] **"A formula for topology/deformations and its significance"**
— joint with Dennis Sullivan, Fundamenta Mathematicae **225**(2014) 229-242

[2] **"Artin covers of the braid group"**
— joint with Meirav Amram and Uzi Vishne J. Knot Th. Ramif. **21(7)** (2012) 1250061/1-44

[3] **"On Habiro's cyclotomic expansions of the Ohtsuki invariant"**
— joint with Ofer Ron, arXiv:math.GT/0501549, J. Knot Th. Ramif. **15(6)** (2006) 661-680

[4] **"Some computations of Ohtsuki series"**
— joint with Nori Jacoby, *NATO-PIMS Advanced Research Workshop,*
'Advances in Topological Field Theory' (Calgary 2001) 53-70, NATO Sci. Ser. II
Math. Phys. Chem., 179, Kluwer Acad. Publ., Dordrecht, 2004

[5] **"A rational surgery formula for the LMO invariant"**
— joint with Dror Bar-Natan, *Israel Journal of Mathematics***140** (2004) 29–60

[6] **"The $PSU(3)$ invariant of the Poincaré homology sphere"**
— *Topology and its Applications* **127** (2003) 153–168

[7] **"Modular forms and quantum invariants of 3-manifolds"**
— joint with Don Zagier *Asian J. Math.* **3** (1999) 93–107.
Special volume dedicated to Sir Michael Atiyah on the occasion of his 70th birthday.

[8] **"On Ohtsuki's invariants of 3-manifolds"**
— *J. Knot Th. Ramif.* **8** (1999) 1049–1063.

[9] **"Witten-Reshetikhin-Turaev invariants of Seifert manifolds"**
— joint with Lev Rozansky *Commun. Math. Phys.* **205** (1999) 287–314.

[10] **"Yang-Baxter type equations and posets of maximal chains"**
— *J. Comb. Th. A***79** (1997) 68–104.

[11] **"Witten-Reshetikhin-Turaev invariants of 3-manifolds as holomorphic functions"**
— in *'Geometry and Physics'*
Eds. J.E. Andersen, J. Dupont, H. Pedersen, A. Swann
Lecture notes in Pure and Applied Mathematics publ. Marcel Dekker **184** (1996) 363-377

[12] **"Braid group representations associated with $\mathfrak{sl}_m$"**
— *J. Knot Th. Ramif.* **5** (1996) 637–660.

[13] **"An Introduction to Topological Field Theory"**
— *Proc. Symp. Appl. Math.* **51** (1996) 89–128.

[14] **"Algebras and triangle relations"**
— *J. Pure Appl. Alg.* **100** (1995) 43–72.

[15] **"Asymptotic expansions of Witten-Reshetikhin-Turaev invariants for some simple 3–manifolds"**
— *J. Math. Phys.* **36** (1995) 6106–6129.
Invited contribution for the Special Issue on *Quantum geometry and diffeomorphism invariant quantum field theory.*

[16] **"Triangulations, categories and extended topological field theories"**
— in *Quantum Topology*, a collection of papers,
Ed. R. Baadhio and L.H. Kauffman, publ. World Scientific (1993) 191–208.

[17] **"A functorial approach to the one-variable Jones Polynomial"**
— *J. Diff. Geom.* **37** (1993) 689–710.

[18] **"Fluorescent transfer of light in dyed materials"**
— joint paper with S.D. Howison,
SIAM J. Appl. Math. **53** (1993) 447–458.

[19] **"On algebras and triangle relations"**
— in *'Proc. 2nd. Int. Conf. on Topological and Geometric Methods in Field Theory, Turku, Finland, 26th. May–1st. June, 1991.'*
Ed. J. Mickelsson, O. Pekonen, publ. World Scientific (1992) 429–447.

[20] **"Connections between CFT and Topology via Knot Theory"**
— in *Lecture Notes in Physics* **375** (1991) 245–254.

[21] **"Homological representations of the Hecke algebra"**
— *Commun. Math. Phys.* **135** (1990) 141–191.

[22] **"Topological approach to the Iwahori-Hecke algebra"**
— *Int. J. Mod. Phys. A* **5** (1990) 3213–3219.

[23] **"A universal link invariant"**
— in *'Proceedings of the IMA conference on Mathematics-Particle Physics Interface, Oxford, England, 12th.–14th. September, 1988.'*
Ed. D.G. Quillen, G.B. Segal, Tsou S.T., publ. Oxford University Press (1990) 151–156.

[24] **"Homology representations of braid groups"**
— Oxford D.Phil. thesis June 1989.

[25] **"Universal Link Invariants using Quantum Groups"**
— in *'Proceedings of the XVII Int. Conf. on Differential Geometric Methods in Theoretical Physics, Chester, England, 15th.–19th. August, 1988.'*
Ed. A. Solomon, publ. World Scientific (1989) 55–63.

Chapters in books
[26] **"The Tait Conjectures"**
— in 'The Changing Shape of Geometry',
Ed. C. Pritchard, publ. Cambridge University Press (2003)

[27] Appendix to **"Elliptic Curves"**
— in *Graduate Texts in Mathematics No. 111*, by *Dale Hüsemoller*,
Publ. Springer-Verlag (1986), Second Edition (2004).

Book and article reviews
[28] **"Hyper-Kähler geometry and invariants of three-manifolds"**
by L. Rozansky and E. Witten *Selecta Mathematica* **3**(1997) 401–458.
— Specially featured review in *Mathematical Reviews* MR 98m:57041

[29] **"Temperley-Lieb Recoupling Theory and Invariants of 3–Manifolds"**
by L. Kauffman and S. Lins Princeton University Press (1994)
— Review in *La Gazette des Mathematicien* 1995

[30] **"Higher algebraic structures and quantisation"**
by D.S. Freed *Commun. Math. Phys.* **159**(1994) 343–398.
— Specially featured review in *Mathematical Reviews* MR 95c:58034

[31] **"Coxeter graphs and towers of algebras"**
by F.M. Goodman, P. de la Harpe and V.F.R. Jones Publ. Springer-Verlag (1989)
— Review in *The Mathematical Gazette* **75** (1991) 259–260.

Teaching books (Hebrew)
[32] **"Advanced Calculus (2) - Lecture notes"**, Akademon (2006)

[33] **"Mathematics for Physicists (1) - Lecture notes"**
— Akademon (2009), third edition (2010) (around 200 pages)

[34] **"Mathematics for Physicists (1) - Exercises and solutions"**
— Akademon (2009), third edition (2011) (around 300 pages)

[35] **"Mathematics for Physicists (2) - Lecture notes"**
— third edition (2012) (around 200 pages)

[36] **"Mathematics for Physicists (2) - Exercises and solutions"**
— second edition (2012) (around 300 pages)

[37] **"Mathematics for Physicists (1) - Extended material"**
— available online at `http://www.ma.huji.ac.il/m̃atap` (2009)
(around 700 pages in English, partially translated into Hebrew)

Supervision of students

Doctoral students:
Jeffrey Sink (1999) 'Asymptotic Expansions of Quantum Invariants and a zeta-function of a knot'
Ofer Ron (2007) 'On the Ohtsuki invariant of rational homology 3-spheres'
Ronen Katz (2015) 'Topological Quantum Field Theory and Tangle Invariants'

Masters students:
Nori Jacoby (2001)'Computation of Ohtsuki series for surgery on 2-strand knots'
Ofer Ron (2002)'A new construction of braid representations'
Eli Mitrani (2006)'The Virsoro algebra on spheres with holes'
Micha Breakstone (2006)'A categorical setting for a (2+1)-dimensional TFT with corners'
Chana Glasner (2012)'Categorification and the Jones polynomial'

Amirim (undergraduate research) projects:
Micha Breakstone (2003)'Exploring a 2+1-d Topological Field Theory'
Nir Gadish (2011)'A free differential Lie algebra model of the 2-cell'
Itay Griniasty (2013) 'Finding points in a free differential Lie algebra of the interval'
Matan Seidel (2015) 'Automorphism Groups of Simple DGLA models'