

Date Revised: 2/27/20

WAYNE STATE UNIVERSITY**Professional Record**

JOHN R. KLEIN

Department of Mathematics

College of Liberal Arts and Sciences

AREA OF RESEARCH: Algebraic Topology

OFFICE ADDRESS:	1213 FAB Building Detroit, MI, 48202 (313) 577-2479	HOME ADDRESS:	14021 Balfour Oak Park, MI 48237 (248) 547-5703
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PRESENT RANK & DATE OF RANK: Professor, 08/2003

WSU APPOINTMENT HISTORY

HIRED AS ASSOCIATE PROFESSOR:	1998
YEAR AWARDED TENURE:	2001
YEAR PROMOTED TO FULL PROFESSOR:	2003

CITIZEN OF: U.S.A.

EDUCATION:

B.A. <i>cum laude</i> in Mathematics,	Northwestern University, 1983
Ph.D. in Mathematics	Brandeis University, 1989

PROFESSIONAL SOCIETY MEMBERSHIPS

American Mathematical Society

HONORS/AWARDS

Alexander von Humboldt Fellowship 10/91-5/93
Wayne State University Career Development Chair 2002-2003
Wayne State University College of Science Teaching Award 2003-2004
Lady Davis Fellowship 2009
EURIAS Fellowship 2017-2018

OTHER APPOINTMENTS

Lecturer, Northeastern University, 9/89-9/90
Visiting Professor, Siegen University (Germany), 9/90-9/91
Visiting Associate Professor, Purdue University, 1/97-5/97
Visiting Associate Professor, Brown University, 9/97-12/98
Assistant Professor, Bielefeld University (Germany), 6/93-8/98
Visiting Scholar, Université Catholique de Louvain (Belgium), 11/02-12/02

Signed _____ Date _____

Visiting Scholar, Stanford University, 7/03-8/03
 Visiting Scholar, Stanford University, 7/04-8/04
 Visiting Scholar, Hebrew University (Jerusalem), 1/05-5/05
 Visiting Scholar, University of Münster (Germany), 5/05-6/05
 Visiting Scholar, Stanford University, 7/05
 Visiting Scholar, Mittag-Leffler Institute (Stockholm), 5/06
 Visiting Scholar, University of Bielefeld, 6/06
 Visiting Scholar, Stanford University, 7/06-8/06
 Visiting Scholar, Stanford University, 8/07
 Visiting Scholar, University of Oslo (Norway), 5/08
 Visiting Scholar, Stanford University, 7/08
 Visiting Scholar, University of Bonn (Germany), 6/09
 Visiting Scholar, University of Bonn (Germany), 7/10
 Visiting Scholar, Stanford University, 8/10
 Visiting Researcher, New Mexico Consortium, 6/11
 Visiting Researcher, Los Alamos Center for Nonlinear Studies, 6/12-7/12
 Visiting Researcher, Nagoya University, 3/4/13-3/13/13
 Visiting Professor, University of Copenhagen, 5/24/13-7/24/13
 Visiting Professor, University of Copenhagen, 6/27/14-7/31/14
 Visiting Professor, University of Copenhagen, 5/1/16-6/30/16
 Eurias Fellow, Israel Institute for Advanced Studies, 9/1/17-6/1/18

I. Teaching

A. Years at Wayne State

Professor, 2003–present
 Associate Professor, 1998-2003
 ——— Sabbatical Leave, Fall 2001 ———
 ——— Career Development Chair Leave, Fall 2002 ———
 ——— Sabbatical Leave, Winter 2005 ———
 ——— Sabbatical Leave, Winter 2013 ———
 ——— Sabbatical Leave, Fall 2017 ———

B. Years at Other Colleges/Universities

Northeastern University 9/89-6/90
 Siegen University 9/90-9/91
 Bielefeld University 6/93-1/97, 6/97-8/98
 Purdue University 1/97-5/97
 Brown University 9/97-1/98

C. Courses Taught at Wayne State in Last Five Years

Undergraduate

2015 W MAT 2020 Calculus II
 2015 F MAT 2030 Calculus III
 2016 W MAT 2020 Calculus II
 2016 W MAT 2030 Calculus III
 2016 F MAT 2030 Calculus III

Signed _____ Date _____

2016 F MAT 1000 Math in Today's World
 2017 W MAT 2020 Calculus II
 2017 W MAT 2150 Differential Equations and Matrix Algebra
 2018 W MAT 2030 Calculus III
 2018 F MAT2210 Elementary Probability and Statistics
 2018 F MAT 2250 Elementary Linear Algebra
 2019 W MAT 2250 Elementary Linear Algebra
 2019 W MAT 2150 Differential Equations and Matrix Algebra
 2019 F MAT 5700 Introduction to Probability Theory

Graduate

2015 W MAT 7500 Topology II
 2015 F MAT 7510 Algebraic Topology I
 2018 W MAT 8000 Kan Seminar
 2019 F MAT 7570 Geometry and Topology: Homological Algebra

D. Directed Studies/Essays/Theses/Dissertations Directed

Current Students

Joshua Turner, Ph.D. student

Ph.D. Dissertations Directed

Mokhtar Aouina,
The moduli space of thickenings, July, 2005
 Lizhen Qin,
Moduli spaces and CW structures arising from Morse theory, July, 2011
 John Peter,
Stabilization and Classification of Poincaré Duality Embeddings, July, 2012
 Michael Catanzaro,
A Topological Study of Stochastic Dynamics on CW Complexes, May, 2016

Directed Studies

Algebraic Topology, Hung Tong Viet, Winter 2007
Algebraic Topology, Lizhen Qin, Fall 2008, Fall 2010,
Algebraic Topology, John Peter, Fall 2009, Winter 2010,
Combinatorics, James Wenson, Winter 2010
Differential Cohomology, Michael Catanzaro, Fall 2012
Group Cohomology, five Ph. D. Students, Fall 2013
Diffeology, Christian Frank, Winter 2015
Knot Theory, Giovanni Santia, Winter 2016

II. Research

D. FUNDED RESEARCH

Spaces of Embeddings
 National Science Foundation,
 8/99-7/02 DMS-9971293. Amount: \$69,000 (Awarded)
 WSU Small Research Grant,

Signed _____ Date _____

Awarded 4/27/00. Amount: \$1,000

Disjunction Statements for Spaces of Embeddings

Wayne State University Research Grant,

Summer 2005. Amount: \$10,000 (Awarded; declined to accept)

Embeddings and Group actions

National Science Foundation,

6/02-5/05 DMS-0201695. Amount: \$96,383 (Awarded)

Career Development Chair Award

WSU Provost, 2002-2003.

Amount: \$19,000

Embeddings, Intersections and Symmetries

National Science Foundation,

4/30/05-4/29/08 DMS-0503658. Amount: \$107,073 (Awarded)

Homotopical Methods in Manifold Theory

National Science Foundation,

4/30/08-4/29/11 DMS-0803363. Amount: \$127,450 (Awarded)

K-theory, Dynamics, and Intersection

National Science Foundation,

7/15/11-6/30/14 DMS-1104355. Amount: \$133,153 (Awarded)

Algebraic Topology, Manifolds and Statistical Mechanics

Simons Foundation,

9/1/14-8/31/19 Award Nr. 317496. Amount: \$35,000 (Awarded)

The Geometry of Poincare Spaces

National Science Foundation,

05/01/15-4/30/18 DMS-1506978. Amount: \$184,880.00 (Not Funded)

RTG: Interactions between Topology and Algebra

(Co-PI) National Science Foundation,

08/17/15-08/16/20 DMS-1502420. Amount: \$1,845,832.00 (Not Funded)

Topological Stochastics

National Science Foundation,

05/01/16-04/30/19 DMS-1607496 Amount: \$172,145 (Not Funded)

The Algebraic Topology of Fluctuations

National Science Foundation,

06/01/18-05/30/21 DMS-1807133 Amount: \$187,483 (Not Funded)

Stochastic dynamics and algebraic topology on manifolds

Simons Foundation,

9/1/19-8/31/24 Identifier 630867. Amount: \$42,000 (Not Funded)

The algebraic topology of fluctuations (LOI)

Simons Foundation,

9/1/19-8/31/24 Identifier 631820. Amount: \$247,140 (Not Funded)

III. Publications

Signed _____ Date _____

D. JOURNAL ARTICLES PUBLISHED

Alphabetical listing of authors is the usual custom in mathematical publications. The order in which the names appear does not necessarily reflect the relative importance of each author's contributions.

Refereed Journals

1. J.R. Klein
Coordinate free Morse theory, *Manuscripta Math.* **71** (1991), 283–294.
2. J.R. Klein and A.I. Suciuc
Inequivalent fibred knots whose homotopy Seifert pairings are isometric, *Math. Ann.* **289** (1991), 683–701.
3. J.R. Klein
A functional relation in stable knot theory, *Math. Ann.* **292** (1992), 103–109.
4. J.R. Klein
Higher Franz-Reidemeister torsion: low-dimensional applications, *Contemp. Math.* **150** (1993), 195–204.
5. J.R. Klein
Higher Reidemeister torsion and parametrized Morse theory, *Rend. Circ. Mat. Palermo (2) Suppl. No. 30* (1993), 15–20.
6. K. Igusa and J.R. Klein
The Borel regulator map on pictures. II. An example from Morse theory. *K-Theory* **7** (1993), 225–267.
7. J.R. Klein
On the homotopy embeddability of complexes in Euclidean space. I. The weak thickening theorem, *Math. Z.* **213** (1993), 145–161.
8. J.R. Klein
On two results about fibrations, *Manuscripta Math.* **92** (1997), 77–86.
9. J.R. Klein and J. Rognes
The fiber of the linearization map $A(*) \rightarrow K(\mathbf{Z})$, *Topology* **36** (1997), 829–848.
10. J.R. Klein, R. Schwänzl and R.M. Vogt
Comultiplication and suspension, *Topology Appl.* **77** (1997), 1–18.
11. J.R. Klein
Structure theorems for homotopy pushouts. I. Contractible pushouts, *Math. Proc. Cambridge Philos. Soc.* **123** (1998), 301–324.
12. M. Golasinski and J.R. Klein
On maps into a co- H -space, *Hiroshima Math. J.* **28** (1998), 321–327.
13. J.R. Klein
Poincaré duality embeddings and fiberwise homotopy theory, *Topology*, **38** (1999), 597–620.
14. J.R. Klein
Poincaré Immersions, *Forum Math.*, **11** (1999), 717–734.
15. J.R. Klein

- Poincaré duality spaces, in *Surveys on Surgery Theory: Volume 1. Papers Dedicated to C.T.C. Wall*, *Ann. of Math. Studies* **145** (2000), 135–165.
16. J.R. Klein
Poincaré embeddings of spheres, *Contemp. Math.* **258** (2000), 263–274.
 17. T. Goodwillie, J.R. Klein and M. Weiss
Spaces of smooth embeddings, disjunction and surgery, *Surveys on Surgery Theory: Volume 2. Papers Dedicated to C.T.C. Wall*, *Ann. of Math. Studies.* **145** (2001), 221–284.
 18. J.R. Klein
The dualizing spectrum of a topological group, *Math. Annalen* **319** (2001), 421–456.
 19. T. Hüttemann, J.R. Klein, F. Waldhausen and B. Williams
The “fundamental theorem” for the algebraic K -theory of spaces I, *J. Pure Appl. Algebra*, **160** (2001), 21–52.
 20. T. Hüttemann, J.R. Klein, F. Waldhausen and B. Williams
The “fundamental theorem” for the algebraic K -theory of spaces: II. The canonical involution, *J. Pure Appl. Algebra* **167** (2002), 53–82.
 21. J.R. Klein
Axioms for generalized Farrell-Tate cohomology,
J. Pure. Appl. Alg. **172** (2002), 225–238.
 22. J.R. Klein
Poincaré embeddings and fiberwise homotopy theory, II,
Quart. Jour. Math. Oxford **53** (2002), 319–335.
 23. J.R. Klein
Embedding, compression and fiberwise homotopy theory,
Algebraic & Geometric Topology **2** (2002), 311–336.
 24. J.R. Klein and J. Rognes
A chain rule in the calculus of homotopy functors,
Geometry & Topology **6** (2002), 853–857.
 25. T. Goodwillie, J.R. Klein and M. Weiss
A Haefliger style description of the embedding calculus tower,
Topology **42** (2003), 509–524.
 26. J.R. Klein
On the derivative of the stable homotopy of mapping spaces,
Homology, Homotopy and Applications **5** (2003) 601–612.
 27. J.R. Klein
Moduli of suspension spectra,
Trans. Amer. Math. Soc., **357** (2005), 489–507.
 28. M. Aouina and J.R. Klein
On the homotopy invariance of configuration spaces,
Alg. & Geom. Topology **4** (2004), 813–827.

29. J.R. Klein
Poincaré submersions,
Alg. & Geom. Topology **5** (2005), 23–29.
30. J.R. Klein
On embeddings in the sphere,
Proc. Amer. Math. Soc., **133** (2005), 2783–2793.
31. J.R. Klein
Fiber products, Poincaré duality and A_∞ -ring spectra,
Proc. Amer. Math. Soc., **134** (2006), 1825–1833.
32. M. Aouina and J.R. Klein
On C.T.C. Wall’s suspension theorem,
Forum Mathematicum, **18** (2006) 829–837.
33. J.R. Klein
The dualizing spectrum, II.,
Alg. & Geom. Topology **7** (2007), 109–133.
34. J. R. Klein and B. Williams
Homotopical intersection theory, I.,
Geometry & Topology **11** (2007), 939–977.
35. J. R. Klein
Poincaré complex diagonals
Math. Zeit., **258** (2008), 587–607.
36. J. Grunewald, J.R. Klein and T. Macko
Operations on A -theoretic nil-terms
Jour. of Topology **1** (2008), 317–341.
37. J. R. Klein and B. Williams
The “fundamental theorem” in the algebraic K -theory of spaces III: the nil-term
Proc. Amer. Math. Soc. **136** (2008), 3025–3033.
38. R. Cohen, J. R. Klein and D. Sullivan
On the homotopy invariance of the string topology loop product and string bracket
Journal of Topology **1** (2008), 391–408
39. T.G. Goodwillie and J.R. Klein
Multiple disjunction for spaces of Poincaré embeddings
Jour. of Topology **1** (2008), 761–803
40. R. Cohen and J. R. Klein
Umkehr Maps
Homology Homotopy Appl. **11** (2009), 17–33
41. J. R. Klein, C. Schochet and S. Smith
Continuous trace C^* -algebras, gauge groups and rationalization
Jour. of Topology and Analysis **1** (2009), 261–288
42. J. R. Klein and B. Williams
The refined transfer, bundle structures and algebraic K -theory

- Jour. of Topology* **2** (2009) 321–345
43. J. R. Klein and B. Williams
Homotopical intersection theory, II: Equivariance
Math Zeit. **264** (2010) 849–880
 44. J. R. Klein and W. Richter
Poincaré duality and periodicity, II. James periodicity
Geom. Dedicata **148** (2010), 291-302
 45. J. R. Klein, C. Schochet and S. Smith
From rational homotopy to K-theory for continuous trace algebras. Superstrings, geometry, topology, and C^* -algebras, 165-171,
Proc. Sympos. Pure Math. **81**, Amer. Math. Soc., Providence, RI, 2010
 46. B. Badzioch, W. Dorabiala, J.R. Klein and B. Williams
Equivalence of higher torsion invariants
Advances in Math. **81**, (2011) 2192–2232
 47. J. R. Klein and W. Richter
Poincaré Duality and Periodicity
Alg. & Geom. Topology **11** (2011), 1961-1985
 48. V.Y. Chernyak, J.R. Klein and N.A. Sinitsyn
Quantization and Fractional Quantization of Currents in Periodically Driven Stochastic Systems I: Average Currents
Jour. Chem. Phys. **136**, 154107 (2012)
 49. V.Y. Chernyak, J.R. Klein and N.A. Sinitsyn
Quantization and Fractional Quantization of Currents in Periodically Driven Stochastic Systems II: full counting statistics
Jour. Chem. Phys. **136**, 154108 (2012)
 50. V. Y. Chernyak, and J. R. Klein and N. A. Sinitsyn
Algebraic Topology and the Quantization of Fluctuating Currents
Adv. Math. **244** (2013), 791–822
 51. J.R. Klein and J.W. Peter
Fake Wedges
Trans. Amer. Math. Soc. **366** (2014), 3771–3786
 52. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
On Kirchhoff’s theorems with coefficients in a line bundle
Homology, Homotopy and Appl. **15** (2013) 267–280
 53. J.R. Klein and J.W. Peter
Charged Spaces
Forum Math. **27** (2015), 2661–2689
 54. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
Kirchhoff’s theorems in higher dimensions and Reidemeister torsion
Homology, Homotopy and Appl. **17** (2015), 165–189
 55. T. G. Goodwillie and J. R. Klein
Multiple disjunction for space of smooth embeddings
Jour. Topol. **8** (2015), 651–674

56. J. R. Klein
 Embeddings, Normal Invariants and Functor Calculus
Nagoya Math. J. **225** (2017), 152–184
57. J. R. Klein and S. Tilson
 On the moduli space of A_∞ structures
 Manifolds and K-Theory, Contemporary Mathematics vol. 682, pp. 141–160, 2017
58. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
 Stochastic dynamics of extended objects in driven systems: I. Higher-dimensional currents in the continuous setting.
Chemical Physics, **481**, (2016), Pages 5–18
59. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
 Stochastic dynamics of extended objects in driven systems II: Current quantization in the low-temperature limit
Chemical Physics, **481**, (2016), Pages 19–27
60. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
 A higher Boltzmann Distribution
J. Appl. Comp. Topol. **1**, (2017), 215–240
61. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
 Exciton scattering via algebraic topology
J. Topol. Anal. (2018) 1–22
62. J. R. Klein and Cary Malkiewich
 The transfer is functorial
Adv. Math. **338** (2018), 1119–1140.
63. J. R. Klein and B. Williams
 Homotopical Intersection Theory, III: multi-relative intersection problems.
Alg. & Geom. Topol. *Algebr. Geom. Topol.* **19** (2019),v1079–1134.

Refereed Journals - Accepted

Refereed Journals - Submitted

64. M. J. Catanzaro, V. Y. Chernyak, and J. R. Klein
 On fluctuations of cycles in a finite CW complex.
 Submitted to *Foundations of Computational Mathematics*
65. J. R. Klein, L. Qin, and Y. Su
 On the various notions of Poincaré duality space.
 Submitted to *Trans. Amer. Math. Soc.*
- M. INVITED SEMINARS OR LECTURES PRESENTED IN THE LAST FIVE YEARS
Unlinked Embeddings and Functor Calculus
 CUNY Topology Seminar (February 4, 2015)
Embedding and Disjunction
 Topology and Geometry Seminar, CIRGET Montreal (April 28, 2015)
Stochastic fluctuations of integer cycles in a finite CW complex
 Topology Seminar, University of Copenhagen (May 26, 2016)
Higher homotopical intersection theory

Topology Seminar, University of Muenster (June 6, 2016)

On the Kirchhoff and Boltzmann distributions in higher dimensions

Workshop on Non-Equilibrium Statistical Physics, Telluride (Plenary Talk, July 6, 2016)

Applications of Higher Dimensional Spanning Trees

CUNY Topology Seminar (January 31, 2017)

On Higher Dimensional Spanning Trees

Colloquium, University of Florida (March, 13 2017)

Hypercurrents

Topology and Dynamics Seminar, University of Florida (March 14, 2017)

Variations on a duet of Kirchhoff and Boltzmann

Colloquium, University of Haifa (November 14, 2017)

Algebraic Topology and Fluctuations

Colloquium, Hebrew University (November 16, 2017)

Algebraic Topology and Fluctuations

Colloquium, Technion Institute of Technology (November 20, 2017)

Periodicity and Duality

Geometry and Topology Seminar, University of Haifa (November 22, 2017)

Exciting Intersections

Geometry and Topology Seminar, Technion Institute of Technology (November 23, 2017)

Poincaré Calculus

Workshop on Functor Calculus (plenary talk), Ohio State (March 16, 2019)

Hypercurrents

CUNY Topology Seminar (February 19, 2020)

Hypercurrents

SUNY Binghamton Geometry and Topology Seminar (March 12, 2020)

IV. Service

C. COMMITTEE ASSIGNMENTS

University

1999 Global Grant Review Committee

2000 Global Grant Review Committee

2001 Global Grant Review Committee

2003 General Education Implementation Committee

2003 General Education Math Competency Subcommittee

2010 Internal evaluator for the WSU Dept. of Economics APR

Signed _____ Date _____

2011-12 CLAS Dean's Search Committee
College

1999 College of Science Retreat
— Recruitment and Student Outreach Committee

College Faculty Council 2002-2013, 2015-2019

CLAS Curriculum Committee 2013-2014, 2015-2016

Research/Ranking Strategic Planning Committee 2004

Dean's appointee to evaluate Mathematics Department Chair 2003-2004

CLAS Research and Scholarship Committee 2006-07

CLAS Dean's Advisory Committees for:

1. Implementing Technology Instruction Fees 2006-07
2. Centers and Institutes 2005-07, 2019-20

Department

Attended Commencement, F 2000

Graduate Committee, 2000-F12, F2013-W2019 (Chair 03-05,06-11)

Graduate Recruitment Committee, 2001-2002, F12, W2013-W2020 (Chair 17-20)

Planning and Advisory Board 2018-20

Personnel Committee, 2002-03, 2007-08, F08, F11

Salary Committee, 2002-04, 2007-08

German Language Examiner 2003-2013

Colloquium Cochair 1999-00, 2005-06

Topology Seminar Chair 1999-02, 2005-06, F07, 2013-2014

G. JOURNAL/EDITORIAL ACTIVITY

1. Editorships

Editor for the Bruce Williams Sixtieth Birthday Festschrift (*Geometriae Dedicata* **148** (2010), 1-2.).

Editor for the *Manifold Atlas* project (www.map.mpim-bonn.mpg.de)

Editor for *Homology, Homotopy and Applications*

3. Referee/Review activities:

Books:

Annals of Mathematics Studies.

Journals:

Topology (2005)

Annals of Mathematics (2005, 2009)

K-theory (2005, 2006, 2007)

J. Pure Appl. Algebra. (2007)

Proc. AMS (2003, 2005)

Ann. Sci. École Norm. Sup. (2002)
Forum Mathematicum
Glasgow Mathematical Journal (2002-2003, 2016-2017)
Math. Zeitschrift (2002, 2003, 2005, 2007, 2008, 2010, 2012)
Geometry & Topology (2003, 2007-08)
Algebraic & Geometric Topology (2008)
Adv. Math. (2003)
Jour. of London Math. Soc. (2006, 2010)
Proc. of Edinburgh Math. Soc. (2006)
Jour. of Topology (2007, 2008, 2009)
Jour. of Edinburgh Math. Soc. (2012, 2014-15)
Jour. of Pure and Appl. Alg. (2015)
Homol. Homotopy. Appl. (2015, 2018)

Conferences:

Organizer of Midwest Topology Seminar (April 28-29, 2007, October 23, 2010)
 Organizer of AIM Workshop on Higher Reidemeister Torsion (October, 2009)
 Scientific Organizer of WCATSS 2012 (July, 2012)

H. OTHER PROFESSIONALLY RELATED SERVICE

Dissertation committee served

Dept. of Mechanical Engineering, April, 2000, Ph.D. Candidate: Joon-Ho Yoo

Dept. of Computer Science, October, 2002, Ph.D. Candidate: Milos Besta

Dept. of Physics, August 2009, Ph.D. Candidate: Nagesh Kulkarni

Dept. of Chemistry (2009), Ph.D. Candidate: Chao Wu

Dept. of Mathematics (2017), Ph.D. Candidate: Gabriel Angellini-Knoll

Proposal Evaluator for German Academic Exchange Service (DAAD), 2004-2011, 2013-2017, 2020

NSF Topology Panel Reviewer 2006, 2007, 2010

Mathematics Curriculum Consultant, Akiva Hebrew Day School, 2004-07

Mathematics liaison for Hillel Day School 2010-2015 (Farmington, MI)

Mathematics consultant for Frankel Jewish Academy 2016 (West Bloomfield, MI)