

CURRICULUM VITAE

Yongbin Ruan

Date of birth: February 14, 1963

Sex: Male

Nationality: Chinese

Address:

Department of Mathematics,
University of Michigan
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USA

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Employment:

2006-present, University of Michigan, Professor
2005-2006, University of Wisconsin-Madison, Van Vleck Professor of Mathematics
1999-2006, University of Wisconsin-Madison, Professor
1995-1999, University of Wisconsin-Madison, Associate Professor
1993-1996 University of Utah, Assistant Professor;
1991-93, Michigan State University, Research Instructor.

Visiting Position

Visiting Professor, MIT, Spring 2008
Clay Senior Scholar, Spring 2006
Ordway Visiting Professor, Minnesota, Oct,2004
Visiting Professor, ETH-Zürich, Aug, 2004
Visiting Professor, Hong Kong University of Science and Technology, 2001-2003
Visiting Member, IHES, (Sep, 2004) and (Aug, 1993)
Visiting Member, Max-Planck-Institute at Bonn, (June-July, 1993)
Visiting Member, Newton Institute, (Dec, 1994)
Visiting Member, MSRI, (Spring, 1994)

Ph.D students

Bohui Chen: Ph.D (2001)
Wanchuan Zhang: Ph.D (2001)
Shengdu Hu: Ph.D (2003)

Mainak Poddar: Ph.D (2001)

Bernado Uribe: Ph.D (2002)

Johann Leida (2004)

Paul Johnson, sixth year

Marc Krawitz, fourth year

Education:

1987-91 University of California, Berkeley, Ph.D. Thesis adviser:

Robion Kirby, Tom Mrowka

1985-86 University of Wisconsin, Madison, Teaching assistant.

1982-85 Sichuan University, Chengdu, P. R. China, M.S. in Mathematics.

1978-82 Sichuan University, B.Sc. in Mathematics.

Professional Activities

1998 Co-organize (with Aaron Bertram) AMS summer geometry conference on quantum cohomology

1999 Initiate (with A. Adem and R. Fintushel) Great Lakes geometry conference series

2001 Co-organize (with A. Adem and J. Morava) Conference on mathematical aspect of orbifold string theory

2001 Co-organize International conference on symplectic geometry in China

2001 Co-organize Hong Kong geometry colloquium

2002 Co-organize ICM satellite conference on stringy orbifolds

2006 Co-chair of program "New topological structure in physics" in MSRI

2009 Co-organize Clay workshop on Geometry and Physics of Landau-Ginzburg model

Fields of interest: Mathematics related to string theory,

Award

Clay Senior Scholar 2006

The Ministry of Education of China Changjiang (Jiangzhuo) Professor, 2000-2005

Distinguished Overseas Young Scientist Awards, National Natural Science Foundation of China, 2000-2003

Vilas associated award 98-2000

ICM98 invited Speaker

Sloan Research Fellowship 95-97

Grant

NSF grant 92-94
NSF grant 94-97
NSF grant 97-2000
NSF grant 2000-2003
NSF grant 2003-2008
NSF grant 2008-2011
Hong Kong RGC grant 2001-2003

Selected Invited Lectures

ICM Invited Lecture, Berlin, 1998
Plenary Lecture on AMS Regional Meeting Plenary (Mar, 2001)
Five Lectures on Summer School on Symplectic Geometry in Paris (July, 2001)
Invited Lecture on Latin American Congress of Mathematicians (June, 2004)

Recent Invited Lectures, colloquiums and seminars

Adelaide University, Australia (Jan, 1999). Midwest topology seminar (Feb, 1999), Courant (Mar, 1999), IAS(April, 1999), Cortona, Italy(June, 1999), Seoul, South Korea (July, 1999). U. of Penn, (Sep, 1999), Midwest geometry conference (Nov, 1999), Columbia University (Nov, 1999), Caltech (Mar-May, 2000), UCLA (Mar, 2000), UC-Irvine (April, 2000), UC-Santa Babara (April 2000). Northwestern (Oct, 2000), MIT (Oct, 2000), UC-Irvine (Mar, 2001), Summer geometric Institute (Aug, 2001), Peking Univ. (Nov, 2001), Academica Sinica (Nov, 2001), Caltech (Feb, 2002), Institute of Advanced studied (Mar, 2002), Princeton (Mar, 2002), MSRI (Mar, 2002), Zhejiang Univ (April, 2002), ICM Satellite conference on stringy orbifold (Aug, 2002), Workshop on derived category(Jan, 2003 at Zhuhuai), Nankai Univ (Mar, 2003), University of Science and Technology (Mar, 2003), Missouri (Sep, 2003), Princeton (Nov, 2003), HKUST (Mar,2004), Symplectic geometry workshop at MSRI (Mar,2004), Clifford workshop at Tulane (Mar, 2004), Utah (April, 2004), UICI (April, 2004), Michigan State (April, 2004), Minnesota (May, 2004), ETH-Zurich (Aug, 2004), Minnesota (Oct, 2004), Montreal (Nov, 2004), Waterloo (Nov, 2004), Irvine (Nov, 2004), Princeton (Dec, 2004), Berkeley (Jan 2005), Chicago (Jan, 2005), Michigan (Feb, 2005), Nanjin (June, 2005), Hua Dong Normal Univ (June, 2005), Summer Algebraic Geometry Institute at Seattle (July, 2005), UBC (Aug, 2005), Mexico (Jan, 2006), Berkeley (May, 2006), Academy Sinica (Aug, 2006), Univ. Of Science and Technology (Aug, 2006). Yamabe Conference (Sep, 2006), Michigan State (Sep, 2006), String Topology Conference (Oct, 2006), UW-Madison (Oct, 2006), Princeton (Dec, 2006), IAS (Dec, 2006), Courant (Dec, 2006), Workshop on quantum cohomology of stack (Henri Poincare institute, Feb 2007), Imperial College (Feb, 2006), HKUST (April, 2007), Suzhou Univ (April, 2007), HongKong Univ (April, 2006), Sichuan Univ (May, 2007), Workshop on quantum cohomology at Tengchong (May, 2007), Conference on lower dimensional topology at Beijing (June, 2007), Chinese Academy (June, 2007), Workshop on algebraic geometry, symplectic geometry and physics at Laussane, Zurich (Aug-Sep, 2007), Utah (Oct, 2007), UBC(Nov, 2007), MIT (Feb, 2008), Harvard (Feb, 2008), FRG workshop at

Stony Brook (Feb, 2008), HKU (March, 2008), Hokkado (lecture series, April, 2008), Harvard (April, 2008), MIT (April, 2008), BU (April, 2008), Chinese Academy (July, 2008), Fudan Univ (July, 2008), Tsinghua Univ (July, 2008), Missouri (Oct, 2008), Northwestern (Oct, 2008).

Book

Orbifolds and stringy topology (joint with A. Adem and J. Leida), Cambridge Tracts in Mathematics, 171. Cambridge University Press, Cambridge, 2007

Publications

- (1) On the cardinality of a topology, Proc. AMS 102 (1988)686-689
- (2) A universal constraint on Donaldson invariants, Jour. Diff. Geom. 35(1992) 711-722
- (3) Torsion classes and a universal constraint on Donaldson invariants for odd manifolds, (joint work with S. Akbulut, T. Mrowka) AMS Transaction vol 347 no 1(1995) 63-76
- (4) Reducible connections on nonsimply connected 4-manifolds, Topology, Geometry and Field Theory, World Scientific.
- (5) Topological sigma model and Donaldson type invariants in Gromov theory, Duke Math. Jour. vol 83, no2(1996), 63-98
- (6) Symplectic topology and algebraic 3-folds, Jour Diff Geom. vol 39, no 1(1)
- (7) Symplectic topology and extremal rays, Geom. Funct. Analysis, vol 3. No 4(1993) 395-430
- (8) Symplectic Topology and complex surfaces, Geometry and Analysis on complex manifolds, World Scientific
- (9) A Mathematical Theory of Quantum Cohomology (joint work with Gang Tian), Journ Diff Geom. vol 42. No 2(1995) 259-367
- (10) Bott-type symplectic Floer cohomology and its multiplication structures (joint work with Gang Tian), Math. Res. Lett. No1(1995)
- (11) Higher genus symplectic invariant and sigma model coupled with gravity (joint work with Gang Tian), Invent. Math. 130(1997)455-516
- (12) Quantum cohomology of projective bundles over \mathbf{P}^n (joint work with Zhenbo Qin), Trans. Amer. Math. Soc. 350 (1998), no. 9, 3615–3638
- (13) Enumeration of nodal genus-2 plane curves with fixed complex structure (joint work with Sheldon Katz and Zhenbo Qin), J. Algebraic Geometry 7(1998)569-587
- (14) Virtual neighborhood and monopole equation, . Topics in symplectic 4-manifolds (Irvine, CA, 1996), 101–116, First Int. Press Lect. Ser., I
- (15) Virtual neighborhood and pseudo-holomorphic curves, Turkish Jour. of Math. 1(1999), 161-231.
- (16) Seiberg-Witten invariants and double cover of 4-manifolds(joint work with S. Wang), Comm. Anal. Geom. 8 (2000), no. 3, 477–515.

- (17) Symplectic Surgery and Gromov-Witten invariants of Calabi-Yau 3-folds (joint work with An-Min Li), *Invent. Math.* 145 (2001), no. 1, 151–218.
- (18) Quantum cohomology and its applications, Lecture at ICM98, *Doc. Math* (1998) Extra Vol II 411-420.
- (19) Surgery, quantum cohomology and birational geometry, Northern California Symplectic Geometry Seminar, 183–198, *Amer. Math. Soc. Transl. Ser. 2*, 196
- (20) A new cohomology theory of orbifolds (joint work with W. Chen), *Comm. Math. Phys* 248,1-31(2004)
- (21) Orbifold quantum cohomology (joint work with W. Chen), *Cont. Math.* vol 310, 25-85
- (22) Discrete torsion and twisted orbifold cohomology, *Journal of Symplectic Geometry*, vol 2, no 1, 1-24,2003
- (23) Orbifold K-theory (joint work with A. Adem), *Comm. Math. Phys.* 237,533-556(2003)
- (24) Orbifold Gromov-Witten theory (joint work with W. Chen), *Cont. Math.* 310, 25-86
- (25) Stringy geometry and Topology of Orbifolds, *Cont. Math.* 312, 187-234
- (26) Cohomology ring of crepant resolution of orbifolds, preprint. *Cont. Math.* Vol 403, 117-126
- (27) Stringy orbifolds, *Cont. Math.* 310, 259-300
- (28) Geometry and analysis of spin equation (joint with H. Fan, T. Jarvis), *Comm. Pure Appl. Math.* 61 (2008), no. 6, 745–788
- (29) The moduli space of regular stable maps (joint with J. Robbin and D. Salamon), *Math. Z.* 259 (2008), no. 3, 525–574.
- (30) Gerbe and twisted orbifold quantum cohomology, *Sci. China Ser. A* 51 (2008), no. 6, 995–1016.
- (31) A stringy product on twisted orbifold K-theory (joint with A. Adem and B. Zhang), [math.AT/0605534](#)
- (32) Birational cobordism invariants of uniruled symplectic manifolds (joint with Jianxun Hu and Tianjun Li), *Invent. Math.* 172 (2008), no. 2, 231–275.
- (33) Quantum cohomology and crepant resolution, a conjecture (joint with Tom Coates), [arXiv:0710.5901](#)
- (34) Uniruled symplectic divisors (joint with Tian-Jun Li), [arXiv:0712.4021](#)
- (35) The Witten equation, mirror symmetry and quantum singularity theory (joint with Huijun Fan and Tyler J. Jarvis), [arXiv:0712.4021](#)
- (36) The Witten equation and its virtual fundamental cycle (joint with Huijun Fan and Tyler Jarvis), [arXiv:0712.4025](#)
- (37) Positive divisors in symplectic geometry (joint with Jianxun Hu), [arXiv:0802.0590](#)