# CURRICULUM VITAE

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## Personal Data

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## Education

Ph. D. University of Toronto, 1998 - 2003.
Thesis: On the moduli space of gauge equivalence classes of flat $G$-connections over a compact nonorientable surface.
Advisor: Lisa C. Jeffrey

M. Sc. National Taiwan University, 1996 - 1999.
Thesis: An estimate for the Gauss curvature of minimal surfaces in $R^m$.
Advisor: Ai-Nung Wang

B. Sc. National Taiwan University, 1992 - 1996.

## Employment

1. **Professor** (2011 - current) Department of Mathematics, National Tsing-Hua University, Taiwan, R.O.C.

2. **Associate Professor** (2009 - 2011) Department of Mathematics, National Tsing-Hua University, Taiwan, R.O.C.

3. **Associate Professor** (2007 - 2009) Department of Mathematics, National Cheng-Kung University, Taiwan, R.O.C.

4. **Assistant Professor** (2003 - 2007) Department of Mathematics, National Cheng-Kung University, Taiwan, R.O.C. (On leave 2004 - 2006)

5. **NSERC Postdoctoral Fellow** (2004 - 2006) Fields Institute for Research in Mathematical Sciences, Toronto, Canada.

## Honors and Awards

1. **JSPS Invitation Fellowship for Research in Japan** (2015) granted by Japan Society for the Promotion of Science, Japan.

2. **National Tsinghua University Research Award** (2011) granted by the National Tsinghua University, Taiwan.

3. **T.-Y. Wu Award** (2009) granted by National Science Council, Taiwan.

4. **Young Theorists Award** (2008) granted by National Center for Theoretical Sciences, Taiwan.

5. **Young Mathematician Award** (2008) granted by the Mathematical Society of the Republic of China, Taiwan.

6. **Young Investigator Merit Award** (2008) granted by National Science Council, Taiwan.

7. **NSERC PDF fellowship** (2004 - 2006) granted by Natural Sciences and Engineering Research Council of Canada.

8. **Ontario Graduate Scholarships** (2002 - 2003) granted by Ontario government, Canada.

9. **Government of Ontario-Israel Halperin Graduate Scholarships in Science and Technology** (1999 - 2000, 2000 - 2001) granted by Ontario government, Canada.

10. **Chow Hong-Ging Scholarship** (1997) granted by Academia Sinica of the Republic of China, Taiwan.

11. **Research Creativity Award** (1996) granted by National Science Council, Taiwan.

## Publications

### I. Published papers:

1. M. Guest and N.-K. Ho, *Kostant, Steinberg, and the Stokes matrices of the tt\*-Toda equations*, Selecta Mathematica (N.S.) **25** (2019 Aug.), no. 3, Art. 50, 43 pp.

2. N.-K. Ho, G. Wilkin, and S. Wu, *Conditions of smoothness of moduli spaces of flat connections and of representation varieties*, Mathematische Zeitschrift, **293(1)**,(2019), 1-23.

3. N.-K. Ho, L. Jeffrey, K.-D. Nguyen, and E. Xia, *The $SU(2)$-character variety of the closed surface of genus 2*, Geom. Dedicata, (2018) **192**, 171-187.

4. M. Guest and N.-K. Ho, *A Lie-theoretic description of the solution space of the tt\*-Toda equations*, Mathematical Physics, Analysis and Geometry, Volume **20**, Issue 4, Dec. 2017.

5. N.-K. Ho, G. Wilkin, and S. Wu, *Hitchin's Equations on a Nonorientable Manifold*, arXiv:1211.0746v3, Comm. Anal. Geom. **26** (2018), no.4, 857-886.

6. N.-K. Ho and C.-C. M. Liu, *Connected Components of Surface Group Representations for Complex reductive Lie groups*, an appendix in *Covering Spaces of Character Varieties* by S. Lawton and D. Ramras, New York Journal of Mathematics, **21** (2015), 383-416.

7. N.-K. Ho and L. C. Jeffrey, *Intersection Cohomology of the Universal Imploded Cross-section of SU(3)*, Pure and Applied Mathematics Quarterly. **10** (2014), no. 4, 675-683.

8. N.-K. Ho and C.-C. M. Liu, *Antiperfect Morse Stratification*, Selecta Mathematica. **17** (2011), no.2 , 505-532.

9. N.-K. Ho, C.-C. M. Liu, and D. Ramras, *Orientability in Yang-Mills Theory Over Nonorientable Surfaces*, Comm. Anal. Geom. **17** (2009), no.5, 903-953.

10. N.-K. Ho and C.-C. M. Liu, *Yang-Mills connections on orientable and nonorientable surfaces*, Memoirs of the American Mathematical Society. **202** (2009), no.948, 1-98.

11. N.-K. Ho and C.-C. M. Liu, *Yang-Mills connections on nonorientable surfaces*, Comm. Anal. Geom. **16** (2008), no.3, 617–679.

12. N.-K. Ho, *On the moduli space of flat connections over a compact surface*, Proceeding of the 4th International Congress of Chinese Mathematicians, Vol II (2007), 339-349.

13. N.-K. Ho and L. C. Jeffrey, *The volume of the moduli space of flat connections of a non-orientable 2-manifold*, Commun. Math. Phys. **256** (2005), 539–564.

14. N.-K. Ho and C.-C. M. Liu, *Connected components of the space of surface group representations II*, Intern. Math. Res. Notices, **16** (2005), 959–979.

15. N.-K. Ho and C.-C. M. Liu, *On the connectedness of the spaces of surface group representations*, Noncommutative Geometry and Physics, World Sci. Publ. Hackensack, NJ (2005), 199–214.

16. N.-K. Ho and L. C. Jeffrey, *Representations of fundamental groups of nonorientable 2-manifolds*, CRM Proceedings and Lecture Notes. Algebraic Structures and Moduli Spaces. **38** (2004), 139–147.

17. N.-K. Ho, *The real locus of an involution map on the moduli space of flat connections on a Riemann surface*, Intern. Math. Res. Notices, **61** (2004), 3263–3285.

18. N.-K. Ho and C.-C. M. Liu, *On the connectedness of moduli spaces of flat connections over compact surfaces*, Canad. J. Math. **56(6)** (2004), 1228–1236.

19. N.-K. Ho and C.-C. M. Liu, *Connected components of the space of surface group representations*, Intern. Math. Res. Notices, **44** (2003), 2359–2372.

20. N.-K. Ho and N.-C. Wong, *Space-filling curves and Hausdorff dimensions*, Southeast Asian Bulletin of Mathematics, **21** (1997), 105–111.

**II. Preprints:**

1. N.-K. Ho, L. C. Jeffrey, P. Selick, and E. Xia, Flat connections and the commutator map for SU(2). Submitted.

**Professional Activities**

1. Co-organizing *First Japan Taiwan Joint Conference on Differential Geometry & 7th TIMS-OCAMI-WASEDA Joint International Workshop on Differential Geometry and Geometric Analysis*, December 2016, Waseda University, Japan. The organizers were Martin Guest, Miyuki Koiso,Yoshihiro Ohnita, Sumio Yamada, Shu-Cheng Chang, River Chiang, Mao-Pei Tsui, and myself.

2. Co-organizing *2015 NCTS Conference on Geometry, Topology and Physics*, December 2015, N.C.T.S. (Hsinchu). The organizers were Siye Wu and myself.

3. Co-organizing *Japan-Taiwan workshop on Moduli spaces of flat connections on surfaces and related topics*, November 2014, Waseda University, Japan. The organizers were Martin Guest, Yoshihiro Ohnita and myself.

4. Co-organizing *Interdisciplinary Workshop between Mathematics and Theoretical Physics: Geometry and Symmetry in Mathematics and Fundamental Physics*, December 2013, N.C.T.S. (Hsinchu). The organizers were Chong-Sun Chu and myself.

5. Co-organizing *NCTS (Taiwan)-CPT(France) Joint Workshop on Symplectic Geometry and Quantum Symmetries in Mathematical Physics*, February 2011, N.C.T.S. (Hsinchu). The organizers were Robert Coquereaux and myself.

6. Co-organizing *Taiwan Geometry Symposium*, two to three times per year. The organizers are River Chiang and Yng-Ing Lee, Mao-Pei Tsui, and myself.

7. Colloquium chair, Fall 2009 - Spring 2010, National Tsing-Hua University.

8. Co-organizing *East Asian Symplectic Conference 2009*, May 2009, Academia Sinica. The organizers were River Chiang, Jih-Hsin Cheng, Chun-Chung Hsieh, Manabu Akaho, Cheol-Hyun Cho and myself.

9. Colloquium chair, Fall 2007 - Spring 2008, National Cheng-Kung University.

10. Organizer, Geometry session, December 2013, December 2007, Taiwan Mathematical Society Annual Meeting.

**Invited Talks**

1. Poisson 2018, Fields Institute, Canada, July 16-20, 2018.

2. Colloquium, National Chiao-Tung University, Taiwan, May 29, 2018.

3. Colloquium, Academia Sinica, Taiwan, March 1, 2018.

4. Session on Symplectic geometry and topology, the Third Pacific Rim Mathematical Association (PRIMA) Congress, Aug 14-18, 2017.

5. Seminar, Penn States University, USA, July 25. 2017.

6. Workshop on Symplectic/Contact Geometry, Academia Sinica, Nov 26-27, 2016.

7. Intense Lecture Series, National Seoul University, Korea, Nov 14-17, 2016.

8. Seminar (Groupe de travail Operateur de Dirac), University Paris-Sud, France, January 2016.

9. Japan-Taiwan workshop on Moduli spaces of flat connections on surfaces and related topics, Waseda University, Japan, November 2014

10. International Workshop on Geometry and Representation Theory, the University of Hong Kong, November 2013

11. Taiwan Mathematical Society Annual Meeting, Geometry session 50-mins invited talk, December 2012

12. THU and NTHU joint Geometry workshop, Tsinghua University, China, July 2012

13. 2012 Workshop on Geometric Partial Differential Equations, National Center for Theoretical Sciences, Taiwan, June 2012

14. Classical and Quantum Aspects of Symplectic Geometry (including the Hong Kong Geometry Colloquium), the University of Hong Kong, March 2012

15. CEB Programme "Geometry and analysis of surface group representations", Institut Henri Poincaré, France, January 2012

16. The 2nd East Asian Symplectic Conference, KIAS, South Korea, June 2011

17. Programme "Moduli spaces", Isaac Newton Institute, England, March 2011

18. Colloquium, National Chiao-Tung University, Taiwan, May 2010

19. Seminaire "Groupes de Lie et espaces des modules", University of Geneva, Switzerland, May 2010

20. Geometry seminar, the University of Hong Kong, Hong Kong, March 2010

21. The 2nd TIMS-OCAMI Joint International Workshop on Differential Geometry and Geometric Analysis, Taiwan, March 2010

22. Colloquium, Academia Sinica, Taiwan, February 2010

23. Seminar on Mathematical Physics, N.C.T.S., Taiwan, October 2009

24. Geometry seminar, National Taiwan University, Taiwan, October 2008

25. Symplectic and Complex Geometry workshop, the University of Hong Kong, Hong Kong, May 2008

26. Workshop on Symplectic and Complex Geometry, N.C.T.S., Taiwan, March 2008

27. International Congress of Chinese Mathematicians 2007, 45-minutes invited talk, China, December 2007

28. Colloquium, National Tsing-Hua University, Taiwan, November 2007

29. Ontario Topology seminar, Fields Institute, Canada, July 2007

30. CMS-MITACS joint conference 2007, Canada, May 2007

31. Colloquium, National Taiwan University, Taiwan, January 2007

32. School on Poisson Geometry and Related Topics (part of Poisson 2006), Japan, May 2006

33. Geometry and Topology seminar, Centre interuniversitaire de recherches en geometrie et topologie, Canada, April 2006

34. Geometry and Topology seminar, McMaster University, Canada, January 2006

35. Geometry/Physics seminar, Northwestern University, USA, November 2005

36. Differential Geometry seminar, Massachusetts Institute of Technology, USA, April 2005

37. Working seminars on the moduli space of flat connections, University of Toronto, Canada, March 2005

38. Symplectic Geometry seminar, University of Toronto, Canada, January 2005

39. Noncommutative Geometry and Physics Conference, Keio University, Japan, February 2004

40. Colloquium, Providence University, Taiwan, May 2004

41. Symplectic Geometry Workshop, Academia Sinica, Taiwan, March, 2004

42. Colloquium, National Chiao-Tung University, Taiwan, February 2004

43. Colloquium, National Cheng-Kung University, Taiwan, December 2003

44. Colloquium, National Sun Yat-sen University, Taiwan, November 2003

45. Colloquium, National Taiwan normal University, Taiwan, November 2003

46. Colloquium, National Taiwan University, Taiwan, October 2003

47. Colloquium, Academia Sinica, Taiwan, October 2003

48. Symplectic Geometry seminar, University of Toronto, March 2003

49. Seminars in Functional Analysis, National Sun Yat-sen University, Taiwan, December 2001.

50. Workshop on Combinatorics, May 25, 1996, National Central University, Taiwan, May 1996.

**Teaching experiences**

**I. Undergraduate course:**

1. Calculus (Instructor), Spring 2019, Fall 2018, Spring 2015, Spring 2014, Fall 2013, Fall 2012, Spring 2012, Fall 2011, Fall 2010, Fall 2009, National Tsing-Hua University

2. Differential Geometry on Surfaces (Instructor), Spring 2015, Fall 2014, Fall 2009, National Tsing-Hua University.

3. Mathematical and Scientific thinking (Instructor, one of the four), Spring 2011, National Tsing-Hua University.

4. Calculus (Instructor), Fall 2008, Spring 2009, Fall 2007, Spring 2008, Fall 2006, Spring 2007, Fall 2003, Spring 2004, National Cheng-Kung University.

5. Topology (Instructor), Spring 2007, National Cheng-Kung University.

6. Differential Geometry on Surfaces (Instructor), Fall 2006, National Cheng-Kung University.

7. Course Assistant (Tutor) of Several Variables Calculus, Fall 1999-2002, Spring 2000-2003, University of Toronto.

8. Course Assistant (Tutor) of Linear Algebra, Fall 1998-2001, Spring 1999-2002, University of Toronto.

9. Course Assistant (Tutor) of Calculus, Fall 1999-2002, Spring 2000-2003, University of Toronto.

**II. Graduate course:**

1. Topics in Symplectic Geometry (Instructor), Fall 2018, National Tsing-Hua University.

2. Introduction to moduli spaces (Instructor), Spring 2016, National Tsing-Hua University.

3. Topics in Geometry: moduli spaces (Instructor), Fall 2012, National Tsing-Hua University.

4. Introduction to Symplectic Geometry (Instructor), Spring 2018, Fall 2010, National Tsing-Hua University.

5. Modern Geometry (Instructor), Fall, 2013, Spring 2012, National Tsing-Hua University.

6. Differential Geometry I (Instructor), Fall 2017, Fall 2016, Fall 2015, National Tsing-Hua University.

7. Differential Geometry II (Instructor), Spring 2018, Spring 2016, National Tsing-Hua University.

8. Introduction to Differential Geometry (Instructor), Fall 2008, Fall 2003, National Cheng-Kung University.

9. Riemannian Geometry (Instructor), Spring 2004, National Cheng-Kung University.

10. Riemannian Geometry (Course Assistant), Spring 2002, University of Toronto.