

# Curriculum Vitae

Ling Long

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## EDUCATION

- *Pennsylvania State University*, Ph.D. in Mathematics, 2002.  
Thesis: *The modularity of elliptic surfaces*.  
Thesis Advisors: Professor Wen-Ching Winnie Li and Noriko Yui at Queen's University.
- *Tsinghua University*, B.S. in Mathematics, 1997.

## EMPLOYMENT HISTORY

2023-present	Micheal F. and Roberta Nesbit McDonal Professor, Louisiana State University
2015-present	Professor, Louisiana State University.
2013–2015	Associate Professor, Louisiana State University.
2012–2013	Michler Visiting Associate Professor, Cornell University.
2009–2014	Associate Professor, Iowa State University.
2003–2009	Assistant Professor, Iowa State University.
2002–2003	Postdoctoral Associate, Institute for Advanced Study.

## OTHER EXPERIENCE

- Visitor, Academia Sinica, Taiwan, May-June 2023
- Visitor, Max Plank Institute for Mathematics, Bonn Germany, May-June 2019
- Visitor, Hong Kong University, 2017, 2018, 2019, 2023
- Research Fellow, Institute for Comp. & Exp. Research in Math., Brown University, Fall 2015
- National Center for Theoretical Sciences, Taiwan, Summer 2007, 2009, 2011, 2013, 2014
- Michler Visiting Associate Professor, Cornell University, 2012-2013
- Visiting Associate Professor, University of California at Santa Cruz, Spring 2010
- NSF ADVANCE Visiting Scholar, McGill University, March 2009.
- Visitor, Institut des Hautes Études Scientifiques, Paris, France, Summer 2005.
- Visiting Graduate Student, Mathematical Science Research Institute, Fall 2000.
- Visiting Graduate Student, Queen's University Canada, Fall 1999.

## HONORS AND AWARDS

- Fellow of American Mathematical Society, Class of 2023
- Undergraduate Teaching Award, College of Science, LSU, 2023
- 2023 Maryam Mirzakhani Lecture at Joint Mathematics Meeting, Boston
- Association for Women in Mathematics Michler Memorial Prize, 2012-2013.
- Clay Mathematics Institute Liftoff Research Fellowship, 2002.
- Pritchard Dissertation Fellowship, Pennsylvania State University, 2002

## PUBLICATIONS

- (1) A book on "Hypergeometric Functions in Number Theory", (with Holly Swisher, Fang-Ting Tu and Yifan Yang) Cambridge University Press, (by invitation, in preparation)

- (2) Lecture notes on “Hypergeometric functions, character sums and applications”, (with Fang-Ting Tu), <https://alozano.clas.uconn.edu/hypergeometric/>
- (3) Traces of Hecke Operators via Hypergeometric Character Sums, with (Jerome W. Hoffman, Wen-Ching Winnie Li, and Fang-Ting Tu), in preparation.
- (4) Hypergeometric functions over finite fields, (with Jenny G. Fuselier, Ravi Ramakrishna, Holly Swisher, and Fang-Ting Tu), *Memoirs of the Amer. Math. Soc.* 280 (1382), (2022).
- (5) A Whipple  ${}_7F_6(1)$  formula revisited, (with Wen-Ching Winnie Li and Fang-Ting Tu), *La Matematica*, 1(2):480–530, (2022).
- (6) Supercongruences for rigid hypergeometric Calabi–Yau threefolds, (with Fang-Ting Tu, Noriko Yui, Wadim Zudilin), *Advances in Math.* 393 No.108058, 49, (2021).
- (7) Some Numeric Hypergeometric Supercongruences, *Proceedings of the Conference on Vertex operator algebras, number theory and related topics*, 139–156, *Contemp. Math.*, 753, Amer. Math. Soc., Providence, RI, (2020).
- (8) Computing Special L-values of Certain Modular Forms with Complex Multiplication, (with Wen-Ching Winnie Li and Fang-Ting Tu), *SIGMA* 14 (2018), 090, 32 pages.
- (9) Potentially  $GL_2$ -type Galois representations associated to noncongruence modular forms, (with Wen-Ching Winnie Li and Tong Liu), *Transactions of the AMS.* 371 (2019), no. 8, 5341–5377.
- (10) Characterization of intersecting families of maximum size in  $PSL(2, q)$ , (with Rafael Plaza, Peter Sin, and Qing Xiang), *Journal of Combinatorial Theory, Series A*, 157 (2018), 461–499.
- (11) Some supercongruences occurring in truncated hypergeometric series, (with Ravi Ramakrishna), *Advances in Math.* 290 (2016), 773–808.
- (12) On a conjecture of Kimoto and Wakayama, (with Robert Osburn, Holly Swisher), *Proceedings of the AMS*, 144 (2016), No. 10, 4319–4327.
- (13) Supercongruences and Complex Multiplication, (with Jonas Kibelbek, Kenvin Moss, Benjamin Sheller, Hao Yuan), *Journal of Number Theory*, 164 (2016), 166–178.
- (14) Preface, (with Jerome Hoffman, Karl Mahlburg, Jorge Morales, Bogdan Oporowski, Robert Perlis, Holly Swisher), *Journal of Number Theory*, 161 (2016), 1–16.
- (15) Hypergeometric series, truncated hypergeometric series, and Gaussian hypergeometric functions, (with Alyson Deines, Jenny G. Fuselier, Holly Swisher, and Fang-Ting Tu), *Directions in Number Theory*, Springer, (2016), 125–160.
- (16) Generalized Legendre curves and Quaternionic Multiplication, (with Alyson Deines, Jenny G. Fuselier, Holly Swisher, and Fang-Ting Tu), *Journal of Number Theory*, 161 (2016), 175–203.
- (17) Atkin and Swinnerton-Dyer congruences and noncongruence modular forms, (with Wen-Ching Winnie Li), *RIMS Kokyuroku Bessatsu*, B51 (2014), 269–299.
- (18) Galois representations with quaternion multiplications associated to noncongruence modular forms, (with A.O.L. Atkin, Wen-Ching Winnie Li, and Tong Liu), *Transactions of the AMS* 365 (2013), 6217–6242.
- (19)  $p$ -adic analogues of Ramanujan type formulas for 1 over Pi, (with Sarah Chisholm, Alyson Deines, Gabriele Nebe, and Holly Swisher), *Mathematics*, vol 1, (2013), 9–31.
- (20) On  $l$ -adic representations for a space of noncongruence cuspforms, (with Jerome William Hoffman and Helena Verrill), *Proceedings of the AMS*, 140 (2012), 1569–1584.
- (21) Fourier coefficients of noncongruence cuspforms, (with Wen-Ching Winnie Li), *Bull. London Math. Soc.* (2012), 591–598.
- (22) Hypergeometric evaluation identities and supercongruences, *Pacific Journal of Math.*, 249-2 (2011), 405–418.

- (23) Jacobsthal identity for  $\mathbb{Q}(\sqrt{-2})$ , (with Ki-Ichiro Hashimoto and Yifan Yang), *Forum Mathematicum*, Volume 24, Issue 6, (2012), 1225–1238.
- (24) Zeros of classical Eisenstein series and recent developments, (with Sharon Garthwaite, Holly Swisher, Stephanie Treneer), *Fields Communications Volume 60, WIN - Women In Numbers, Proceedings of the WIN Workshop*, (2011), 251–263.
- (25) A cubic analogue of the Jacobsthal identity, (with Heng-Huat Chang and Yifan Yang), *Math. Monthly*, 118:4 (2010), 316–326.
- (26) A supercongruence motivated by the Legendre family of elliptic curves, (with Heng-Huat Chang and Wadim Zudilin) *Mathematical Notes*, Vol. 88, No. 4, (2010), 599–602.
- (27) Catalan loops, (with Jonathan D. H. Smith), *Mathematical Proceedings of Cambridge Philosophical Society*, Vol. 149, (2010), 445–453.
- (28) Zeros of some level 2 Eisenstein series, (with Sharon Garthwaite, Holly Swisher, Stephanie Treneer), *Proceedings of the AMS*, 138 (2010), 467–480.
- (29) On modular forms for some noncongruence subgroups of the modular group II, (with Chris Kurth), *Bull. London Math. Soc.* Vol. 41 (2009), 589–598.
- (30) On Atkin and Swinnerton-Dyer congruence relations (3), *Journal of Number Theory*, Vol. 128 No. 8, (2008), 2413–2429.
- (31) Computations with finite index subgroups of  $\mathrm{PSL}_2(\mathbb{Z})$  using Farey Symbols, (with Chris Kurth), *Advances in Algebra and Combinatorics, Proceedings of the Second International Congress in Algebra and Combinatorics*, World Scientific, (2008), 225–242.
- (32) On modular forms for some noncongruence subgroups of the modular group, (with Chris Kurth), *Journal of Number Theory*, Vol. 128 No. 7 (2008), 1989–2009.
- (33) Finite index subgroups of the modular group and their modular forms, *Modular Forms and String Duality*, *Fields Institute Communications*, Vol. 54, (2008), 83–102
- (34) On Atkin and Swinnerton-Dyer congruence relations (2), (with A.O.L. Atkin and Wenching Winnie Li), *Mathematische Annalen*, Vol. 340, No.2 (2008), 335–358.
- (35) Reciprocity for Stirling and multi-restricted numbers, (with Ji Young Choi, Siu-Hung Ng and Jonathan Smith), *Journal of Comb. Theory, Series A*, Vol.113 (2006), 1050–1060.
- (36) A short proof of Milne’s formulae for sums of integer squares, (with Yifan Yang), *International Journal of Number Theory*, Vol. 1 No. 4 (2005), 533–551.
- (37) On Atkin and Swinnerton-Dyer congruence relations, (with Wen-Ching W.Li and Zifeng Yang), *Journal of Number Theory*, Vol. 113, No.1 (2005), 117–148.
- (38) Modular forms for noncongruence subgroups, (with Wen-Ching W. Li and Zifeng Yang), *Quarterly Journal of Pure and Applied Mathematics*, Vol. 1, No.1, (2005), 205–221.
- (39) On Shioda-Inose structures of one parameter families of K3 surfaces, *Journal of Number Theory*, 2004, Vol.109, No.2 (2004), 299–318.
- (40)  $L$ -series of certain elliptic surfaces, *Canadian Math. Bulletin*, Vol. 46, No.4 (2003), 546–558.
- (41) On a Shioda-Inose structure of a family of K3 surfaces, *Calabi-Yau Varieties and Mirror Symmetry*, *Fields Institute Communications* 38, AMS Providence RI (2003), 201–207.

## EDITORIAL SERVICES

- Editor, *Proceedings of American Mathematical Society*, 2022-2026.
- Editorial board member of the proceedings for the Third Trimester of “Triangle Groups, Belyi Uniformization, and Modularity” at BP Pune, India, (2022-).
- Co-Editor of “Special Issue on Modular Forms and String Theory in Honor of Noriko Yui” by *Symmetry, Integrability and Geometry: Methods and Applications*, (2018).

- Co-Editor of “Automorphic forms and its applications in number theory and combinatorics”, a special issue of Journal of Number Theory dedicated to Professor Wen-Ching Winnie Li, (2016).
- Co-Editor of “Directions in Number Theory”, Proceedings of the 2014 WIN3 Workshop, ISBN 978-3-319-30976-7, (2016).

#### AMS COMMITTEE

- Fan Fund committee (2020–2022), committee chair (2021–2022)
- JMM Program Committee (2024-2025)
- Award for Impact on Teaching and Learning of Mathematics Selection Committee (2024-2026)

#### PROFESSIONAL MEMBERSHIPS

- American Mathematical Society (AMS).
- Association for Women in Mathematics (AWM).

#### RESEARCH SUPPORT

- Simons Foundation: Travel Support for Mathematicians, **PI**, 2023-2028
- NSF DMS 1951773, **co-PI**, 2020-2023, *Southern Regional Number Theory Conference Series*
- NSA grant #H89230-21-1-0005, **co-PI**, 2020-2023, *Southern Regional Number Theory Conference Series*
- NSF DMS 1602047, **PI**, 2016-2021, *The arithmetic of hypergeometric varieties and noncongruence modular forms*
- NSF DMS 1642598, **PI**, 2016-2017. *Hypergeometric motives and Calabi-Yau differential equations Conference*
- NSF DMS 1363265, **PI**, 2014-2015. *Applications of Automorphic Forms in Number Theory and Combinatorics Conference*
- NSF DMS 1303292, **PI**, 2013-2016. *Noncongruence Modular Forms and Supercongruences*
- NSF DMS 1001332, **PI**, 2010-2014 *Modular Forms for Noncongruence Subgroups*
- NSA, **PI**, 2008-2010, *The Arithmetic of Noncongruence Modular Forms*
- AWM-NSF Mentoring Travel Grant, 2005-2006

#### PH.D. STUDENTS

- (1) Joohyung Kim, Mathematics, (co-major, Ph.D. 2005, Iowa State University).
- (2) Chris Kurth, Mathematics, (PH.D. 2009, Iowa State University).
- (3) Liem Nguyen, Mathematics, (PH.D. 2021, Louisiana State University)
- (4) Bao Pham, Mathematics, (co-major, PH.D. 2021, Louisiana State University)
- (5) Emma Lien, Mathematics, (2019-)
- (6) Brian Grove, Mathematics, (co-major, 2021-)
- (7) Paresh Arora, Mathematics, (2023-)
- (8) Esme Rosen, Mathematics, (co-major, 2023-)

## POSTDOCS

- (1) Tim Huber, 2007-2009, Associate Professor, University of Texas Rio Grande Valley
- (2) Jonas Kibelbek, 2011-2012, Applied Research Mathematician, National Security Agency
- (3) Luca Candelori, 2014 -2017, Assistant Professor, Wayne State University
- (4) Michael Allen, 2022-, Postdoc Fellow, Louisiana State University

## WOMEN IN NUMBER THEORY (WIN)

- *Member* of Steering committee for WIN since 2015
- *Group leader*, WIN1, BIRS 2008 workshop.
- *Group leader*, WIN2, BIRS 2011 workshop.
- So far I have mentored 9 junior female number theorists:
  - Holly Swisher, Full Professor at Oregon State University.
  - Jenny Fuselier, Sharon Garthwaite, Stephanie Treneer: Associate Professors.
  - Fang-Ting Tu Assistant Professor at Louisiana State University
  - Alyson Deines is a Postdoc at Center for Communication Research La Jolla.
  - Sarah Chisholm is a Precepto at Harvard University.
  - Liem Nguyen (PH.D. 2021) and Emma Lien (current) are two graduate students at Louisiana State University

## LECTURE SERIES

- A Lecture Series on Hypergeometric Functions, University of Connecticut, 2021

## INVITED TALKS SINCE 2019

- Invited Speaker, HKU Number Theory Days 2023, Hong Kong University, 2023
- Invited Speaker, Number Theory Day, Institute of Mathematics, Academia Sinica, Taiwan 2023
- 2023 Maryam Mirzakhani Lecture at Joint Mathematics Meeting, Boston
- Invited Speaker, the year-long program on “Triangle Groups, Belyi Uniformization, and Modularity” at Bhaskaracharya Pratishthana Pune, India, 2021-2022.
- Invited Speaker, BIRS Lattices and Cohomology of Arithmetic Groups, October 2021
- Invited Speaker, Number theory, strings, and quantum physics, IPUM, Japan, June 2021
- Seminar Speaker, Vanderbilt University, March 2021
- Colloquium Speaker, Tulane University, October 2019
- Plenary Speaker, Taiwan National Center for Theoretical Sciences International Conference on Arithmetic of Function Fields and Diophantine Geometry Conference, May 2019
- Plenary Speaker, UpState Number Theory Conference, Ithaca, April 2019

## CONFERENCES ORGANIZED

- *Co-Organizer* of the following AMS special sessions:
  - JMM 2023 at Boston, JMM 2015 at San Antonio, JMM 2008 at San Diego
  - AMS Sectional Meeting at Iowa City in 2011
- *Co-Organizer* of the *Southern Regional Number Theory Conferences*, 2023, 2022, 2019, 2017
- *Chief-Organizer* of the following “Crossroad between Modular Forms and Physics” workshops.

- Banff International Research Station (BIRS)-IAS 22w5189, *Modular Forms in Number Theory and Physics*, October 2022.
- BIRS 16w5009, *Modular Forms in String Theory*, September, 2016.
- *Co-Organizer*, *Hypergeometric motives and Calabi-Yau differential equations*, a 3-week program, the MATRIX Institute, Melbourne Australia, January 2017.
- *Chief Organizer*, *Applications of Automorphic Forms in Number Theory and Combinatorics in Honor of Professor Wen-Ching Li*, LSU, April, 2014, with more than 100 participants.
- *Co-Organizer*, BIRS 14w5009, *WIN 3*, April, 2014.
- *Chief Organizer*, *Noncongruence modular forms and modularity*, American Institute for Mathematics Workshop, August 2009.

External Reviewer for Ph.D. thesis:

- Indian Institute of Technology Guwahati (2020)