FANG-TING TU

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Department of Mathematics, Louisiana State University, Baton Rouge, LA, 70803

EMPLOYMENT RECORD

- Fall 2023 — Present: Associate Professor, Louisiana State University, USA
- Fall 2016 — Summer 2023: Assistant Professor, Louisiana State University, USA
- Jan. 2016 — Feb. 2016: Postdoctoral Fellow, National Center for Theoretical Sciences, Taiwan
- Fall 2105: Semester Program Research Fellow, Institute for Computational and Experimental Research in Mathematics, USA.
- 2013 — 2015: Postdoctoral Fellow, National Center for Theoretical Sciences, Taiwan
- Spring 2012 — Spring 2013: Assistant Professor, Waseda University, Japan
- Summer 2010: Instructor, National Chiao Tung University, Taiwan

EDUCATION

September 2013	**PhD in Applied Mathematics**, National Chiao Tung University, Taiwan Advisor: Yifan Yang.
March 2012	**D. Sc. in Mathematics,** Waseda University, Japan Advisor: Kiichiro Hashimoto.
April 2011~March 2012	The Graduate Students Study Abroad Program sponsored by National Science Council, Taiwan. Department of Pure and Applied Mathematics, School of Fundamental Science and Engineering, Waseda University.
June 2006	**M. Sc. in Applied Mathematics,** National Chiao Tung University, Taiwan Advisor: Yifan Yang.
June 2004	**B.Sc. in Applied Mathematics,** National Chiao Tung University.

RESEARCH GRANTS

1. NSF research grant (DMS #2302531, 2023--2026)
2. SLMath 2023 Summer Research in Mathematics (6/12-6/23/2023). Group Members: Angelica Babei, Manami Roy, Holly Swisher, and Bella Tobin.
3. AWM-NSF Mathematics Mentoring Travel Grants (4/1/2017-6/30/2018)
   Mentor: Wen-Ching Winnie Li

CONFERENCE/WORKSHOP GRANTS

1. NSF Conference Grant (2341365, $35,000): Southern Regional Number Theory Conference (2024--2026)
   PI: Gene Kopp.
2. NSF Conference Grant (1951773, $29,931): Southern Regional Number Theory Conference

(2020--2024) Co-PI: Ling Long

3. NSA Conference Grant (H98230-21-1-0005, $11,220): Southern Regional Number Theory Conference (optional year: 2024) Co-PI: Ling Long

WOMEN IN NUMBERS (WIN)

I have been involved in the WIN research community since the 2013 workshop and participated in research projects at the workshops WIN3 (2014) and WIN5 (2020, virtual).

1. WIN5: co-lead a group project with Holly Swisher. Group Members: Angelica Babei, Lea Beneish, Manami Roy, Bella Tobin.
2. WIN3. Group Members: Alyson Deines, Jenny Fuselier, Ling Long (project leader), Holly Swisher.

PUBLICATIONS

1. Angelica Babei, Manami Roy, Holly Swisher, Bella Tobin, and Fang-Ting Tu, *Supercongruences arising from Ramanujan-Sato Series*. arXiv: 2408.08844
2. Jerome William Hoffman and Fang-Ting Tu, *QM abelian varieties, hypergeometric character sums and modular form*. arXiv: 2408.06562
3. Jerome William Hoffman, Wen-Ching Winnie Li, Ling Long, and Fang-Ting Tu, *Traces of Hecke Operators Via Hypergeometric Character Sums*. arXiv: 2408.02918 (submitted)
4. Michael Allen, Brian Grove, Ling Long, and Fang-Ting Tu, *The Explicit Hypergeometric-Modularity Method I*. arXiv: 2404.00711 (submitted)
5. Jerome William Hoffman and Fang-Ting Tu, *Transformations of Hypergeometric Motives*. arXiv: 2003.05031
6. Angelica Babei, Lea Beneish, Manami Roy, Holly Swisher, Bella Tobin, and Fang-Ting Tu, *Generalized Ramanujan-Sato Series arising from Modular Forms.* Research Directions in Number Theory: Women in Numbers V, 87-131, 2024. arXiv: 2202.13253
7. Wen-Ching Winnie Li, Ling Long, and Fang-Ting Tu, A Whipple ${}_7F_6$ *formula revisited*. La Matematica, 1-51, 2022.
8. Jenny G. Fuselier, Ling Long, Ravi Ramakrishna, Holly Swisher, Fang-Ting Tu. *Hypergeometric Functions over Finite Fields.* Mem. Amer. Math. Soc. 280, no. 1382, 2022.
9. Ling Long, Fang-Ting Tu, Noriko Yui and Wadim Zudilin, *Supercongruences for Rigid Hypergeometric Calabi-Yau Threefolds.* Adv. Math., 393: Paper N. 108058, 49, 2021
10. Wen-Ching Winnie Li, Ling Long, and Fang-Ting Tu, Computing Special L-values of Certain Modular Forms with Complex Multiplication. SIGMA 14, 090, 32 pages, 2018
11. Fang-Ting Tu and Yifan Yang, *Evaluation of Certain Hypergeometric Functions over Finite Field*s. SIGMA 14, 050, 18 pages, 2018.

12. Sharon Frechette, Holly Swisher, Fang-Ting Tu. *A Cubic Transformation Formula for Appell-Lauricella Hypergeometric Functions over Finite Fields.* Res. in Number Theory 2018 4:27.
13. Alyson Deines, Jenny G. Fuselier, Ling Long, Holly Swisher, Fang-Ting Tu. *Hypergeometric series, truncated hypergeometric series, and Gaussian hypergeometric functions.* Directions in Number Theory, Proceedings for Women in Numbers 3, AWM series, 125-159, 2016.
14. Alyson Deines, Jenny G. Fuselier, Ling Long, Holly Swisher, Fang-Ting Tu. *Generalized Legendre Curves and Quaternionic Multiplication*. J. Number Theory, 161, 175-203, 2016.
15. Yi-Shuan Lin and Fang-Ting Tu. *Twisted Kloosterman Sums.* J. Number Theory 147, 666-690, 2015.
16. Fang-Ting Tu, *Schwarzian differential equations associated to Shimura curves of genus zero.* Pacific J. Math. 269, no. 2, 453–489, 2014.
17. Fang-Ting Tu. *Algebraic transformations of hypergeometric functions arising from theory of Shimura curves.* RIMS Kôkyûroku Bessatsu B44, 223-245, *Res. Inst. Math. Sci. (RIMS), Kyoto,* 2013.
18. Fang-Ting Tu and Yifan Yang, *Algebraic transformations of hypergeometric functions and automorphic forms on Shimura curves.* Trans. Amer. Math. Soc. **365**, 6697-6729, 2013.
19. Fang-Ting Tu and Yifan Yang, *Lattice packing from quaternion algebras.* RIMS Kôkyûroku Bessatsu, B32, *Res. Inst. Math. Sci. (RIMS), Kyoto,* 2012.
20. Kiichiro Hashimoto and Fang-Ting Tu. *Genus two lifts of Q-curves witch are of GL_2-type with $\sqrt{-2}$- multiplication.* 2012 Waseda University Number Theory Conference Proceeding (in Japanese)
21. Fang-Ting Tu, *On orders of M(2,K) over a non-archimedean local field*. Int. J. Number Theory, 7(5):1137-1149, 2011.
22. Fang-Ting Tu and Yifan Yang, *Defining equations of $X_0(2^{2n})$,* Vol.46, No.1:105-113, Osaka J. Math, 2009.

Preprints in Progress:

1. Michael Allen, Brian Grove, Ling Long, and Fang-Ting Tu. *The Explicit Hypergeometric-Modularity Method II* .

Lecture Note:

2. Ling Long, Holly Swisher, Fang-Ting Tu, and Yifan Yang. Hypergeometric Functions, Character Sums, and Applications. (In progress)
   Link to a primitive version, provided by Ling Long's mini lectures given at University of Connecticut in 2021.

THESES

1. Fang-Ting Tu, *Automorphic Forms on Shimura Curves,* D. Sci. thesis, National Chiao Tung University, 2013.

2. Fang-Ting Tu, *On the Arithmetic of Quaternion Orders and Its Applications,* D. Sci. thesis, Waseda University, 2012.
3. Fang-Ting Tu, *Modular Parameterization of Rational Elliptic Curves,* M. Sci. thesis, National Chiao Tung University, 2006.

SERVICE AND ORGANIZATIONAL ACTIVITIES

1. SERVICE AT LOUISIANA STATE UNIVERSITY:

SCHOLAR SPONSOR

Ph.D. Students:

- Koustav Mondal (jointly supervise with Gene Kopp, 2024 Spring --)
- Esme Rosen (jointly supervise with Ling Long, 2023 Fall --)
- Brian Grove (joint advising with Ling Long, 2021 Fall-)
- Bao Pham (joint advised with Ling Long, Ph.D. 2021)
- Shashika Petta Mestrige (joint advised with Karl Mahlburg, Ph.D. 2021)

Undergraduate Students:

- August (Ricky) LeBlanc (2017 Summer, 2018 Spring-2019 Spring)

SEMINAR CHAIR

- LSU Algebra and Number Theory Seminar, 2017 Fall – 2022 Fall; co-organizer 2022 Fall –

2. CONFERENCE ORGANIZED

a. 2025 JMM AMS Special Session on Modular Forms, Hypergeometric Functions, and Related Topics. January 8-11, 2025. (Seattle)
b. Southern Regional Number Theory Conference 2024: Celebrating 10 Years, March 9-11, 2024 (LSU)
c. 35th Automorphic Forms Workshop, May 22-26, 2023 (LSU)
d. The 6th TX-LA Undergraduate Mathematics Conference, March 25-26, 2023. (LSU)
e. 2023 JMM AMS Special Session on Quadratic Forms, Modular Forms, and Applications. January 4-7, 2023. (Boston, chief organizer)
f. Southern Regional Number Theory Conference. March 12-13, 2022. (LSU, chief organizer)
g. Workshop on Calabi-Yan Manifolds. Summer 2020 (Taiwan, cancelled)
h. Southern Regional Number Theory Conference. March 20-21, 2020. (LSU, cancelled due to COVID-19, chief organizer)
i. Southern Regional Number Theory Conference. April 13-14, 2019. (LSU, chief organizer)
j. Southern Regional Number Theory Conference. In honor of Robert Perlis on his retirement. April 8-9, 2017. (LSU)

3. PANELIST

a. National Research and Development Agency, CHILE
b. National Science Foundation, USA.

4. ANONYMOUS REFEREEING

Acta Arithmetica, Adv. Math, American Mathematical Monthly, AMS Contemporary Mathematics Proceedings, Electronic Research Archive, Expositiones Mathematicae, Indian Journal of Pure and Applied Mathematics, Integral Transforms and Special Functions, Proceedings of the AMS, Journal of Contemporary Mathematics (Universal Wiser, Singapore), Journal of Mathematical Analysis and Applications, Journal of Combinatorial Theory, Journal of Difference Equations and Applications, Journal of Number Theory, Monatshefte für Mathematik, Publicationes Mathematicae, The Ramanujan Journal, Research in Number Theory, RIMS Kôkyûroku Bessatsu, Rocky Mountain Journal of Mathematics, SIGMA, Taiwanese Journal of Mathematics, Transactions of the AMS.

5. OTHER SERVICE

- Reviewer for MathSciNet since 2017.
- Mentoring (together with graduate student Bao Pham) middle school students to work on Science Fair projects

PUBLIC TALKS

1. (Cancelled) Zero to Shero: A Chance for Girls to Fall in Love with Math. (Parallel Event of the NGO CSW64 Forum, sponsored by International Network of Women Engineers and Scientists (INWES)), New York, USA, March 11, 2020. (All the events were cancelled due to the threat posed by the coronavirus (COVID-19).)

CONFERENCE TALKS

1. Hypergeometric Functions over Finite Fields and a Whipple Formula, the 10th Pan Asia Number Theory Conference, RIMS, Japan, December 8, 2021. (Virtual)

2. A Whipple ${}_7F_6$ −Formula Revisited, Fall Southeastern Sectional Meeting: Experimental Mathematics in Number Theory and Combinatorics, November 21, 2021. (Virtual)

3. A Geometric Interpretation of a Whipple's ${}_7F_6$ −Formula, 2020 CMS Winter Meeting: Computations with Arithmetic Groups, December 8, 2020. (Virtual)

4. Hypergeometric Systems, Fall Southeastern Sectional Meeting at Gainesville: Experimental Mathematics in Number Theory and Combinatorics, Florida, USA, November 2, 2019.

5. Computing Special L-Values of Certain Modular Forms with Complex Multiplication, Spring Central and Western Joint Sectional Meeting at Honolulu, Arithmetic and Transcendence of Special Functions and Special Values, Hawaii, USA, March 23, 2019
6. Computing Special L-Values of Certain Modular Forms with Complex Multiplication, Spring Southeastern Sectional Meeting at Auburn, Experimental Mathematics in Number Theory, Analysis, Combinatorics, Alabama, USA, March 16, 2019
7. Computing Special L-Values of Certain Modular Forms with Complex Multiplication, 2019 Joint Mathematics Meetings, Baltimore, USA, January 18, 2019
8. Supercongruences for Rigid Hypergeometric Calabi–Yau Threefolds, Aspects of Automorphic Forms and Applications, Hong Kong, July 11, 2017.
9. Supercongruences Occurred to Rigid Hypergeometric Type Calabi–Yau Threefolds, Winter 2017 Workshop on Algebraic Varieties, Hodge Theory and Motives, Toronto, March 10, 2017.
10. Supercongruences Occurred to Rigid Hypergeometric Type Calabi–Yau Threefolds, MATRIX program: Hypergeometric Motives and Calabi-Yau Differential Equations, Australia, January 17, 2017.
11. Generalized Legendre Curves and Quaternionic Multiplication, 2017 Joint Mathematics Meetings, USA, January 7, 2017.
12. Hypergeometric Functions and Hypergeometric and Hypergeometric Abelian Varieties, BIRS Workshop: Modular Forms in String Theory, Canada, September 29, 2016.
13. Hypergeometric Series and Gaussian Hypergeometric Functions, LSU Mini-Workshop on Algebraic Varieties, Hypergeometric Series, and Modular Forms, USA, April 14, 2015
14. Generalized Legendre Curves and Quaternionic Multiplication, LSU Mini-Workshop on Algebraic Varieties, Hypergeometric Series, and Modular Forms, USA, April 7, 2015
15. Generalized Legendre Curves and Quaternionic Multiplication, The Annual meeting of the Taiwan Mathematica Society, Taiwan, December 6, 2014.
16. Automorphic Forms on Shimura Curves of Genus Zero, 2014 NCTS Conference on the Impact of Computation on Number Theory, Taiwan, August 3, 2014
17. Automorphic Forms on Shimura Curves of Genus Zero, Women in Numbers 3, Canada, April 24, 2014
18. Automorphic Forms on Shimura Curves, 4th East Asia Number Theory Conference, Taiwan, January 21, 2014
19. Automorphic Forms on Shimura Curves (I)(II), TIMS 2013 Summer School on Algebra and Number Theory, Taiwan, August 29,30, 2013
20. Schwarzian differential equations associated to Shimura curves of genus zero, Workshop on Algebra and Geometry 2013, Taiwan, April 28, 2013.
21. Schwarzian differential equations associated to Shimura curves of genus zero, 2013 NCTS Minimal Workshop on Shimura Curves, Taiwan, March 20, 2013.

22. Genus two lifts of Q-curves witch are of GL_2-type with $\sqrt{-2}$-multiplication, 2012 NCTS Japan-Taiwan Joint Conference on Number Theory, Taiwan, August 31, 2012.

23. Genus two lifts of Q-curves witch are of GL_2-type with $\sqrt{-2}$-multiplication, The 16th Number Theory Meeting at Waseda University, Japan, March 21, 2012

24. Algebraic Transformations of Hypergeometric Functions and Automorphic Forms on Shimura Curves, Program of RIMS Workshop "Algebraic Number Theory and Related Topics", Japan, November 28, 2011.

25. Algebraic transformations of hypergeometric functions and automorphic forms on Shimura curves, PMI-NCTS Number Theory Workshop, Korea, July 25, 2011.

26. On orders of M(2,K) over a non-Archimedean local field, Taiwan-Korea Workshop on Number Theory, Taiwan, July 5, 2010.

27. On orders of M(2,K) over a non-Archimedean local field, Joint Workshop on Number Theory between Japan and Taiwan, Japan, March , 2010.

28. Defining equations of $X_0(2^{2n})$, XXVth Journées Arithmétiques, Edinburgh, July 5, 2007.

Colloquium and Seminar Talks

1. Traces of Hecke Operators via Hypergeometric Character Sums, Algebra and Number Theory Seminar, Oregon State University, October 24, 2023.
2. Hypergeometric Functions over Finite Fields, Number Theory Seminar at Institute of Mathematics, Academia Sinica, Taiwan, July 12, 2023.
3. Hypergeometric Character Sums II: A Whipple Formula Revisited, A Series of Trimester Programs on Triangle Groups, Belyi Uniformization, and Modularity, Bhaskaracharya Pratishthana, Pune, India, June 30, 2022 (Virtual)
4. Hypergeometric Character Sums I: Supercongruences for Rigid Hypergeometric Calabi–Yau Threefolds , A Series of Trimester Programs on Triangle Groups, Belyi Uniformization, and Modularity, Bhaskaracharya Pratishthana, Pune, India, June 23, 2022 (Virtual)
5. Hypergeometric Functions over Finite Fields and a Whipple Formula Revisited, Organ State University Number Theory Seminar, January 18, 2022. (Virtual)
6. A Whipple Formula Revisited, University of Rochester, Algebra and Number Theory (Virtual) Seminar, April 29, 2021
7. A Whipple ${}_7F_6$-Formula Revisited, Heilbronn Number Theory (Virtual) Seminar, April 28, 2021
8. Hypergeometric Functions over Finite Fields, University of Manitoba, Virtual Colloquium, November 26, 2020. (Rescheduled)
9. Hypergeometric Functions, Oregon State University, REU Virtual Colloquium, July 13, 2020.
10. Supercongruences for Rigid Hypergeometric Calabi–Yau Threefolds, University of Wisconsin, Madison, Number Theory Seminar, March 22, 2018.
11. Supercongruences for Rigid Hypergeometric Calabi–Yau Threefolds, Pennsylvania State University

Algebra and Number Theory Seminar, August 10, 2017.

12. Supercongruences for Rigid Hypergeometric Calabi–Yau Threefolds, National Center for Theoretical Sciences (NCTS) Number Theory Seminar, June 28, 2017.
13. Hypergeometric Functions over Finite Fields, Texas A&M Number Theory Seminar, October 26, 2016.
14. Hypergeometric Functions over Finite Fields and Their Applications, LSU Algebra and Number Theory Seminar, October 4, 2016.
15. Modular Forms on Shimura Curves and Hypergeometric Functions, Colloquium, LSU, USA, February 15, 2016.
16. Counting Number Fields of Low Degree, NCTS Seminar on Number Theory, Taiwan, November 5, 2014.
17. Composition Laws (I), (II), NCTS Seminar on Number Theory, Taiwan, October 15 & 29, 2014.
18. Automorphic Forms on Shimura Curves of Genus Zero, LSU Seminar on Number Theory, USA, April 27, 2014.
19. Evaluation of Certain Hypergeometric Functions over Finite Fields, NCTS Seminar on Number Theory, Taiwan, January 8, 2014.
20. Twisted Kloosterman Sums, NCTS Seminar on Number Theory, Taiwan, November 27, 2013.
21. Some Results in the Theory of Modular Curves and Shimura Curves, Department of Mathematics , National Kaohsiung Normal University, Taiwan, April 15, 2013.
22. Some Results in the Theory of Modular Curves and Shimura Curves, Department of Mathematics , National Central University, Taiwan, March 19, 2013.
23. Genus two lifts of Q-curves witch are of GL_2-type with $\sqrt{-2}$-multiplication, Waseda University Seminar on Number Theory, Japan, October 5, 2012.
24. Equation of Shimura Curves (I) and (II), NCTS Seminar on Number Theory, Taiwan, March 14, 2012
25. On Orders of M(2,K) over a Non-Archimedean Local Field, Waseda University Seminar on Number Theory, Japan, May 20, 2011.
26. Equations of Shimura Curves of Genus One, NCTS Seminar on Number Theory, Taiwan, March 9, 2011.
27. Algebraic Transformations of Hypergeometric Functions and Automorphic Forms on Shimura Curves. NCTS Seminar on Number Theory, Taiwan, December 15, 2010.
28. Lattice Packings from Quaternion Algebras, NCTS Working/ Student Seminar on Number Theory, Taiwan, August 5, September 7, 2010.
29. Finite Graph and Orders in M(2, K) over Local Fields, NCTS Seminar on Number Theory, Taiwan, March 24, 2010.

AWARDS RECEIVED

1. NCTU Outstanding Teaching Assistant (2009, Abstract Algebra)

COURSES TAUGHT AT LSU:

Graduate Courses:

1. Math 7230, Topic in Number Theory
   - The Arithmetic of CM Elliptic Curves and Modular Forms, Fall 2024
   - Modular Forms, Spring 2024 (co-teach with Michael Allen)
   - Introduction to Modern Number Theory, Spring 2023
   - Arithmetic of Quaternion Algebras in Number Theory, Spring 2022
   - Hypergeometric Functions, Fall 2020
   - Elliptic Curves and Modular Forms, Spring 2020
   - Modular Forms, Fall 2017
2. Math 7210, Algebra (I)
3. Math 7999, Selected Readings in Mathematics

Undergraduate Courses:

4. Math 4999, Selected Readings in Mathematics
5. Math 4181, Elementary Number Theory (Communication-Intensive course)
6. Math 4153, Finite Dimensional Vector Spaces
7. Math 2085, Linear Algebra
8. Math 1552, Analytic Geometry and Calculus II
9. Math 1550, Analytic Geometry and Calculus I

OTHER TEACHING EXPERIENCES:

Lecturer:

1. Introduction to Galois Cohomology, 2014, NCTS Spring Short Course on Number Theory
2. Representation Theory of Finite Groups, 2013, NCTS Summer Program on Number Theory
3. Foundation Modern Mathematics, Recitation, 2012 Fall (WU)
4. Science and Engineering Laboratory (Physics), 2012, Spring and Fall
5. Foundations of Algebra, Fall 2012 (WU, International course, English)
6. Advanced Algebra, Fall 2012 (WU, International course, English)
7. Calculus (I), summer course, 2010 (NCTU)

Teaching Assistant: (at NCTU)

a. 2005 Calculus (I),(II)
b. 2006 Linear Algebra (I), Elementary Number Theory
c. 2007Abstract Algebra (I),(II)
d. 2008 Abstract Algebra (I), Linear Algebra (II)
e. 2009Abstract Algebra (I),(II)

f. 2010Abstract Algebra (I),(II)