

# Thái Hoàng Lê

## Curriculum Vitae

Department of Mathematics,  
The University of Mississippi,  
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### Employment

- 2015–present **Assistant professor**, *University of Mississippi*, University, MS.  
2014–2015 **Sophie Germain postdoctoral fellow**, *Ecole Polytechnique*, Palaiseau, France.  
2011–2014 **Bing Instructor**, *University of Texas at Austin*, TX.  
2010–2011 **Member**, *Institute for Advanced Study*, Princeton, NJ.

### Research Interests

**Number Theory, Combinatorics.**

### Education

- 2005–2010 **University of California, Los Angeles, CA**, PhD in Mathematics.  
Advisor: Prof. Terence Tao. Thesis title: Topics in Arithmetic Combinatorics in Function Fields.  
2004–2005 **University of Paris 6 (Pierre and Marie Curie), Paris, France**.  
M.S. in Mathematics (M2 Algèbre et Géométrie).  
2002–2004 **Ecole Polytechnique, Palaiseau, France**.  
B.S. in Mathematics.

### Grants and Awards

- 2017–2021 **Grant DMS-1702296**, *National Science Foundation*.  
2017–2018 **Ralph E. Powe Junior Faculty Enhancement Award**, *Oak Ridge Associated Universities*, one of 37 nationwide awards across multiple disciplines.  
2016–present **Summer research grants (2016, 2017, 2019, 2020)**, *College of Liberal Arts, University of Mississippi*.  
2013 **Faculty travel award**, *UT Austin*.  
2012–2014 **AMS-Simons travel grant**.  
2009–2010 **Dissertation Year Fellowship**, *UCLA*.  
2005–2006 & 2008–2009 **Pauley Fellowship**, *UCLA*.  
2002–2005 **Scholarship of Ecole Polytechnique**, France.  
1998–1999 **International Mathematical Olympiad**, *Bronze medal 1998, Gold medal 1999*.  
**Asian-Pacific Mathematical Olympiad**, *Gold medal 1999*.

### Publications

- (with P.-Y. Bienvenu and B. Girard), **On additive bases in infinite abelian semigroups**, *preprint*.
- (with A. Lê), **Multidimensional configurations in the primes with shifted prime steps**, *preprint*.
- (with Z. Ge), **Essential components in vector spaces over finite fields**, *preprint*.
- (with Z. Ge), **On theorems of Wirsing and Sanders**, *Acta Arithmetica* 189 (2019), no. 4, 381–390.

- (with P.-Y. Bienvenu), **Linear and quadratic uniformity of the Möbius function over  $\mathbf{F}_q[t]$** , *Mathematika* 65 (2019), Issue 3, 505–529.
- (with P.-Y. Bienvenu), **A bilinear Bogolyubov theorem**, *European Journal of Combinatorics* 77, March 2019, 102–113.
- (with A. Bhowmick and Y-R. Liu) **A note on character sums in finite fields**, *Finite Fields Appl.* 46 (2017), 247–254.
- (with M. Kelly) **Van der Corput sets with respect to compact groups**, *Archiv der Mathematik* 110 (2018), no. 4, 343–349.
- (with V. Lambert and A. Plagne) **Additive bases in groups**, *Israel J. Math.*, 217 (2017), no. 1, 383–411.
- (with A. Bhowmick) **On primitive elements in finite fields of low characteristic**, *Finite Fields Appl.* 35 (2015) 64–77.
- (with A. Bhowmick, A. Gabizon and D. Zuckerman) **Deterministic extractors for additive sources**, *ITCS (Innovations in Theoretical Computer Science) 2015*.
- (with Y-R. Liu) **Equidistribution of polynomial sequences in function fields, with applications**, *preprint*.
- (with J. D. Vaaler) **Multiplicatively badly approximable matrices in fields of power series**, *Proc. Amer. Math. Soc.* 143 (2015), no. 9, 3791–3800.
- (with C. V. Spencer) **Intersective polynomials and Diophantine approximation, II**, *Monatsh. Math.* 177 (2015), no. 1, 79–99.
- (with J. D. Vaaler) **Sums of products of fractional parts**, *Proc. London Math. Soc.* (3) 111 (2015), no. 3, 561–590.
- (with J. Wolf) **Polynomial configurations in the primes**, *Int. Math. Res. Not.* (2014) 2014 (23): 6448–6473.
- (with M. Kelly) **Uniform dilations in higher dimensions**, *J. London Math. Soc.* (2013) 88 (3): 925–940.
- (with C. V. Spencer) **Intersective polynomials and Diophantine approximation**, *Int. Math. Res. Not.* (2014) 2014 (5): 1153–1173.
- **Partition regularity and the primes**, *C. R. Math. Acad. Sci. Paris* 350 (2012), no. 9–10, 439–441.
- **Problems and results on intersective sets**, *Combinatorial and Additive Number Theory: CANT 2011 and 2012, Springer Proceedings in Mathematics & Statistics* 101, Springer 2014.
- (with Y-R. Liu) **On sets of polynomials whose difference set contains no squares**, *Acta Arith.* 161 (2013), 127–143.
- (with C. V. Spencer) **Difference sets and the irreducibles in function fields**, *Bull. Lond. Math. Soc.* 43 (2011), no. 2, 347–358.
- **Intersective polynomials and the primes**, *Journal of Number Theory* 130 (2010), Issue 8, 1705–1717.
- **Green-Tao theorem in function fields**, *Acta Arith.* 147 (2011), 129–152.
- (with J. Cilleruelo) **On a question of Sárközy on gaps of product sequences**, *Israel J. Math.* 179 (2010), 285–295.

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## Teaching Experience

2015–present **Instructor**, *Mathematics Department*, University of Mississippi.

- Unified Calculus & Analytic Geometry IV (Math 264, Spring 2017, Spring 2018, Spring 2019, Spring 2020)
- Unified Calculus & Analytic Geometry III (Math 263, Fall 2015 (2 sections), Fall 2016, Fall 2017, Fall 2018)
- Unified Calculus & Analytic Geometry II (Math 262, Spring 2017, Spring 2019)
- Unified Calculus & Analytic Geometry I (Math 261, Spring 2016, Fall 2019, Fall 2020)
- Advanced Calculus I (Math 555, Spring 2016, Fall 2019, Fall 2020)

- Advanced Calculus II (Math 556, Fall 2016, Spring 2020)
- Topics in modern mathematics: Fourier analysis meets number theory (Math 647, graduate course, Fall 2018)
- Graduate reading course (Travis Dirlle (Spring 2016), Zhenchao Ge (Spring 2016-Spring 2020), Awatef Almuteri (Fall 2018, Spring 2019), Apoorva Mate (Spring 2020))

2011–2014 **Instructor**, *Mathematics Department*, UT Austin.

- Complex Analysis (M361, Spring 2013)
- Differential Calculus (M408K, Spring 2013)
- Arithmetic Combinatorics (M390C, graduate course, Fall 2012)
- Introduction to Number Theory (M328K, Summer 2012, Spring 2014)
- Probability I (M362K, Spring 2012, Fall 2013)
- Discrete Mathematics (M325K, Fall 2011, Summer 2014)
- Sequences, Series, and Multivariable Calculus (M408D, Fall 2011, Spring 2014)
- Conference course (Aadil Sarfani, Fall 2013)

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## Adivising and mentoring

- Zhenchao Ge (co-advised with Micah Milinovich), Ph.D. 2020, University of Mississippi. Thesis title: Topics in Analytic and Combinatorial Number Theory.
- Awatef Almuteri, M.S. 2019, University of Mississippi. Thesis title: Quadratic Reciprocity: Proofs and Applications.
- Edward Hu (2018), Oxford high school, MS.

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## Seminar and conference talks

- Jun 2020 **Number Theory Seminar**, *Kansas State University*, online.
- May 2020 **Combinatorial and Additive Number Theory 2020**, *CUNY graduate center*, online.
- Feb 2020 **Mathematics seminar**, *Mississippi State University*, Starkville, MS.
- Oct 2019 **7th annual Mississippi Discrete Math Workshop**, *University of Mississippi*, Oxford, MS.
- Oct 2019 **Number Theory seminar**, *University of Mississippi*, Oxford, MS.
- Jun 2019 **Nancy-Metz Number Theory seminar**, *Université de Lorraine*, Nancy, France.
- Jun 2019 **Discrete Mathematics, Coding Theory and Cryptography seminar**, *Université Paris 8*, France.
- May 2019 **Algebra and Number Theory seminar**, *Institute of Mathematics*, Hanoi, Vietnam.
- Apr 2019 **Dynamical Systems seminar**, *Northwestern University*, Evanston, IL.
- Apr 2019 **Discrete Mathematics seminar**, *Georgia State University*, Atlanta, GA.
- Mar 2019 **Combinatorics and Probability seminar**, *Ohio State University*, Columbus, OH.
- Jan 2019 **2nd Vietnam Workshop on Graph Theory and Discrete Geometry**, *Vietnam Institute for Advanced Study in Mathematics*, Hanoi, Vietnam.
- Jan 2019 **Number Theory seminar**, *Taida Institute for Mathematical Sciences*, Taipei, Taiwan.
- Nov 2018 **6th annual Mississippi Discrete Math Workshop**, *University of Mississippi*, Oxford, MS.
- Oct 2018 **Integers 2018**, *Augusta*, GA.
- Sep 2018 **Discrete Mathematics seminar**, *Texas State University*, San Marcos, TX.
- May 2018 **International Conference on Mathematics and Statistics (ICOMAS 2018)**, *special session on Combinatorics*, *University of Memphis*, TN.
- Apr 2018 **Dynamical Systems seminar**, *University of Houston*, TX.
- Mar 2018 **Analysis and PDE seminar**, *University of California, Los Angeles*, CA.
- Mar 2018 **Number Theory seminar**, *University of California, Irvine*, CA.
- Jan 2018 **Combinatorial Number Theory seminar**, *University of California, Riverside*, CA.

- Jan 2018 **Joint mathematics meetings, AMS special session on Diophantine Approximation and Analytic Number Theory**, San Diego, CA.
- Dec 2017 **Algebra and Number Theory seminar**, *Institute of Mathematics*, Hanoi, Vietnam.
- Nov 2017 **5th annual Mississippi Discrete Math Workshop**, *University of Mississippi*, Oxford, MS.
- Sep 2017 **Palmetto Number Theory Series XXVIII**, *University of Tennessee*, Knoxville, TN.
- Apr 2017 **Discrete mathematics seminar**, *Texas State University*, San Marcos, TX.
- Sep 2015 **Combinatorics seminar**, *University of Mississippi*, Oxford, MS.
- Jul 2015 **Journées Arithmétiques 2015**, *University of Debrecen*, Debrecen, Hungary.
- Jun 2015 **Analysis seminar**, *University of Crete*, Heraklion, Greece.
- May 2015 **Number Theory seminar**, *University of York*, York, UK.
- May 2015 **Number Theory seminar**, *Royal Holloway, University of London*, Egham, UK.
- Apr 2015 **Number Theory seminar**, *Taida Institute for Mathematical Sciences*, Taipei, Taiwan.
- Mar 2015 **Séminaire CAESAR de combinatoire additive**, *Ecole Polytechnique*, Palaiseau, France.
- Nov 2014 **Colloquium**, *University of Mississippi*, Oxford, MS.
- Sep 2014 **Algebra, Number Theory, and Combinatorics seminar**, *University of Texas at Austin*, TX.
- May 2014 **Combinatorial and Additive Number Theory 2014**, *CUNY Graduate Center*, New York, NY.
- May 2014 **Colloquium**, *Lehman College, CUNY*, New York, NY.
- Mar 2014 **Colloquium**, *Texas State University*, San Marcos, TX.
- Jan 2014 **Colloquium**, *Baruch College, CUNY*, New York, NY.
- Nov 2013 **Workshop on Heights in Diophantine geometry, group theory and additive combinatorics**, *Erwin Schrödinger International Institute for Mathematical Physics*, Vienna, Austria.
- Sep 2013 **Algebra, Number Theory, and Combinatorics seminar**, *University of Texas at Austin*, TX.
- May 2013 **Number Theory seminar**, *University of Waterloo*, ON, Canada.
- May 2013 **Combinatorial and Additive Number Theory 2013**, *CUNY Graduate Center*, New York, NY.
- Apr 2013 **Number Theory seminar**, *UIUC*, Urbana-Champaign, IL.
- Mar 2013 **Joint Caltech/UCLA Analysis seminar**, Los Angeles, CA.
- Mar 2013 **AMS Southeastern Section Meeting, special session on modern methods in analytic number theory**, *University of Mississippi*, Oxford, MS.
- Jan 2013 **Combinatorics seminar**, *Georgia Institute of Technology*, Atlanta, GA.
- Oct 2012 **AMS Central Section Meeting, special session on additive and combinatorial number theory**, *University of Akron*, OH.
- Oct 2012 **Number Theory seminar**, *Texas A&M University*, College Station, TX.
- Sep 2012 **Algebra, Number Theory, and Combinatorics seminar**, *University of Texas at Austin*, TX.
- Mar 2012 **Number Theory seminar**, *University of Georgia*, Athens, GA.
- Mar 2012 **VIGRE student seminar**, *University of Georgia*, Athens, GA.
- Mar 2012 **Groupe de travail en combinatoire arithmétique**, *Ecole Polytechnique*, Palaiseau, France.
- Mar 2012 **Séminaire CAESAR de combinatoire additive**, *Ecole Polytechnique*, Palaiseau, France.
- Nov 2011 **Algebra, Number Theory, and Combinatorics seminar**, *University of Texas at Austin*, TX.
- Nov 2011 **Number Theory Seminar**, *Kansas State University*, Manhattan, KS.

- Jun 2011 **The Pretentious View of Analytic Number Theory**, *Mathematics Research Communities*, Snowbird, UT.
- May 2011 **Combinatorial and Additive Number Theory 2011**, *CUNY Graduate Center*, New York, NY.
- Sep 2010 **Postdoc short talks**, IAS, Princeton, NJ.
- Apr 2010 **Number Theory seminar**, *University of Waterloo*, ON, Canada.
- Jan 2010 **Number Theory seminar**, *Penn State University*, State College, PA.
- Jan 2010 **Analysis and PDE seminar**, *UCLA*, CA.
- Jan 2010 **Number Theory seminar**, *Northwestern University*, Evanston, IL.
- Dec 2009 **Algebra, Number Theory, and Combinatorics seminar**, *University of Texas at Austin*, TX.
- Nov 2009 **AMS Western Sectional Meeting, special session on arithmetic combinatorics**, *UC Riverside*, CA.
- Oct 2009 **Integers 2009**, *University of West Georgia*, Carrollton, GA.
- Aug 2009 **Participating Analysis seminar**, *UCLA*, CA.
- Jul 2009 **Journées Arithmétiques 2009**, *Université de St. Etienne*, France.
- May 2009 **Combinatorial and Additive Number Theory 2009**, *CUNY Graduate Center*, New York, NY.
- Apr 2009 **Number Theory seminar**, *Universidad Autónoma de Madrid*, Spain.
- Dec 2008 **Western Number Theory Conference**, *Colorado State University*, Fort Collins, CO.
- Sep 2008 **Harmonic Analysis/Ergodic Theory/Additive Combinatorics student seminar**, *University of California*, Berkeley, CA.
- May 2008 **Combinatorial and Additive Number Theory 2008**, *CUNY Graduate Center*, New York, NY.
- Mar 2008 **Centre de Recerca Matemàtica**, *Bellaterra*, Spain.
- Apr 2007 **Participating Analysis seminar**, *UCLA*, CA.

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## Education and outreach activities

### Mathematics competitions

- 2017–present Since 2017 I have been involved in the University of Mississippi Math Tournament, a competition for high school students which attracts many students from across Mississippi and Tennessee. In 2018 I co-organized and wrote half of the problems for both the team and individual competitions.
- Mar 2017 Served as judge for the mathematics section at the Regional Science Fair for high school students held by the University of Mississippi.
- Feb 2016 Trained and chaperoned University of Mississippi's team at the undergraduate student competition at the LA/MS meeting of the MAA.

### Outreach talks

I have been giving popular mathematics talks to high school and undergraduate students. I strive to communicate ideas from higher mathematics in a way that is easily accessible and stimulating to the public. Topics include Ramsey theory, the Banach-Tarski paradox, and the isoperimetric inequality.

- Mar 2020 **Research in Math club, Liberal Arts and Science Academy**, *Austin*, TX.
- May 2019 **PME society, University of Mississippi**, *Oxford*, MS.
- Oct 2018 **PME society, University of Mississippi**, *Oxford*, MS.
- Dec 2017 **Tran Phu High School**, *Hai Phong*, Vietnam.
- Dec 2017 **Lam Son High School**, *Thanh Hoa*, Vietnam.
- Dec 2017 **Foreign Trade University**, *Hanoi*, Vietnam.

- Dec 2017 **High School for Gifted Students, Hanoi National University of Education, Hanoi, Vietnam.**
- Nov 2017 **PME society, University of Mississippi, Oxford, MS.**
- March 2017 **PME society, University of Mississippi, Oxford, MS.**
- Other activities**
- Jun 2018 & Jun 2019 Served as co-lead instructor for RUBI (Rebel Upward Bound Institute), a summer program targeted at underrepresented and underprivileged high school students from nearby Calhoun and Yalobusha counties in Mississippi. Our program used the inquiry-based learning approach which promotes critical thinking, problem solving and teamwork skills.
- Apr 2018 Represented the mathematics department at University of Mississippi's STEM Fest, which consisted of activities to promote science to the public, especially children.

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## Professional activities

- Co-organizer of the special session on Analytic Number Theory, International Conference on Mathematics and Statistics (ICOMAS 2018), University of Memphis, May 7–10 2018.
- Short-term visits Centre de Recerca Matemàtica (Spain), Ecole Polytechnique (France), Mathematical Sciences Research Institute (Berkeley), Taida Institute for Mathematical Sciences (Taiwan), Universidad Autónoma de Madrid (Spain), University of Waterloo (Canada), University of York (UK), Sorbonne Université (France).
- Referee for mathematical journals Acta Mathematica Vietnamica, American Journal of Mathematics, Bulletin of the London Mathematical Society, Compositio Mathematica, Czechoslovak Mathematical Journal, Discrete Analysis, Finite Fields and Their Applications ( $\times 4$ ), IEEE Transactions on Information Theory, International Mathematical Research Notices, International Journal of Number Theory ( $\times 3$ ), Journal of the European Mathematical Society ( $\times 2$ ), Journal of Number Theory, Manuscripta Mathematica, Mathematika, Mathematische Zeitschrift, Proceedings of the American Mathematical Society ( $\times 2$ ), The Ramanujan Journal, Taiwanese Journal of Mathematics.
- Served on Ph.D. committee of Wasin Vipismakul (UT Austin), Ph.D. examination committee of Shuntaro Yamagishi (University of Waterloo), master's thesis committee of Zhenchao Ge (University of Mississippi), Mashael Alsharif (University of Mississippi), Lucas Schnubel (Sorbonne Université).  
Member of Mathematics department's Assessment Committee, University of Mississippi.

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## Languages

Native Vietnamese, fluent English, French, good Spanish, elementary German, Italian, Latin.