

# Theodore Molla

## Curriculum Vitae

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University of South Florida                              Email: [molla@usf.edu](mailto:molla@usf.edu)  
Department of Mathematics and Statistics      website: <http://shell.cas.usf.edu/~molla>  
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**Research Interests:** Graph Theory, Hypergraphs, Extremal Graph Theory,  
Probabilistic Methods, Computational Complexity

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**Affiliation:** *August 2017-to date* University of South Florida – Assistant Professor

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**Postdoc:** *August 2013-August 2017* University of Illinois at Urbana-Champaign – J. L. Doob postdoc

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**PhD:** *August 2013* Arizona State University  
Advisors: A. Czygrinow and H.A Kierstead  
Title: *Tiling Directed Graphs with Cycles and Tournaments*

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**Current Grant:** *6/2015 thru 7/2018*, NSF Grant \$300,000  
Awarded NSF Grant as co-PI with PI József Balogh and co-PI Jozef Skokan,  
Title: *Sparse Discrete Structures*

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## Publications

### Published or Accepted

- (1) *Transitive triangle-tilings in oriented graphs*, accepted by Journal of Combinatorial Theory, Series B (with J. Balogh and A. Lo).
- (2) *A refinement of theorems on vertex disjoint chorded cycles*, Graphs and Combinatorics (January 2017) 181-201 (with M. Santana and E. Yeager).
- (3) *Sharpening an Ore-type version of the Corrádi-Hajnal theorem*, published by Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg (with H.A. Kierstead, A. Kostochka, and E. Yeager).
- (4) *Spanning trees with leaf distance at least  $D$* , accepted by Discrete Mathematics. (with C. Erbes, S. Mousley, and M. Santana).
- (5) *Triangle factors of graphs without large independent sets and of weighted graphs*, accepted by Random Structures and Algorithms (with J. Balogh and M. Sharifzadeh and Appendix by C. Reiher and M. Schacht).
- (6) *Increasing paths in edge-ordered graphs: the hypercube and random graphs*, The Electronic Journal of Combinatorics (2016) P2.15. (with J. De Silva, F. Pfender, T. Retter and M. Tait)
- (7) *The semi-degree threshold for anti-directed Hamilton cycles*, The Electronic Journal of Combinatorics (2015) P4.34. (with L. DeBiasio)

- (8) *Arbitrary orientations of Hamilton cycles in digraphs*, SIAM J. Discrete Math. (2015), 29-3, 1553–1584. (with L. DeBiasio, D. Kühn, D. Osthus and A. Taylor)
- (9) *An extension of the Hajnal-Szemerédi theorem to directed graphs*, Combinatorics, Probability and Computing. (September 2015) 754–773. (with A. Czygrinow, L. DeBiasio and H.A. Kierstead)
- (10) *On directed versions of the Corrádi-Hajnal corollary*, European Journal of Combinatorics (November 2014) 1–14. (with A. Czygrinow and H.A. Kierstead)
- (11) *Tight co-degree condition for the existence of loose Hamilton cycles in 3-graphs*, SIAM J. Discrete Math. (2014), 28-1, 67–76. (with A. Czygrinow)
- (12) *A note on relaxed equitable coloring of graphs*, Information Processing Letters (November 2011) 1062–1066. (with H. Fan, H.A. Kierstead, G. Liu, J. Wu and X. Zhang)

### Papers (Submitted)

- (1) *Long rainbow cycles and Hamiltonian cycles using many colors in properly edge-colored complete graphs* (with J. Balogh)
- (2) *An algorithmic answer to the Ore-type version of Dirac’s question on disjoint cycles* (with H.A. Kierstead, A. Kostochka and D. Yager)
- (3) *Triangle-tilings in graphs without large independent sets*, (with J. Balogh, A. McDowell and R. Mycroft)
- (4) *Tiling directed graphs with tournaments* (with A. Czygrinow, L. DeBiasio and A. Treglown)

### Manuscripts to be submitted

- (1) *Disjoint cycles and chorded cycles in a graphs with given minimum degree* (with M. Santana and E. Yeager)

## Talks

### Invited Talks

- *Triangle-tilings in graphs without large independent sets*, AMS Fall Central Sectional Meeting, Special Session on Probabilistic and Extremal Combinatorics, October 30, 2016
- *Ladders in dense graphs*, AMS Fall Eastern Sectional Meeting, Special Session on New Developments in Graphs and Hypergraphs, September 24, 2016
- *Perfect triangle-tilings*, EXCILL 3: External Combinatorics at Illinois, August 10, 2016
- *Tiling directed graph with tournaments*, SIAM Conference on Discrete Math, Minisymposium on Graph Theory, June 9, 2016
- *Tiling directed graph with tournaments*, AMS Spring Central Sectional Meeting, Special Session on Probabilistic and Extremal Combinatorics, April 16, 2016.
- *Factors in graphs, directed graphs and weighted graphs*, Iowa State University, Discrete Math Seminar, March 22, 2016.
- *Factors in graphs, directed graphs and weighted graphs*, University of Illinois Mathematics Colloquium, December 9, 2015.
- *Factors in graphs, directed graphs and weighted graphs*, Atlanta Lecture Series, November 14, 2015.
- *Factors in graphs, directed graphs and weighted graphs*, Illinois State University Discrete Math Seminar, November 5, 2015.
- *Arbitrary orientations of Hamilton cycles in digraphs*, AMS Spring Central Sectional Meeting, Special Session on Extremal Graph Theory: Hypergraphs, Directed Graphs, and Other Generalizations, March 15, 2015

- *The Absorbing method*, 2nd Lake Michigan Workshop on Combinatorics and Graph Theory, March 8, 2015
- *Factors in graphs, directed graphs and hypergraphs*, Western Michigan University Mathematics Colloquium, February 26, 2015
- *Hajnal-Szemerédi type theorems*, Atlanta Lecture Series, Emory University, November 1, 2014
- *Equitable coloring and H-factors of graphs*, Miami University Mathematics Colloquium, October 23, 2014
- *Minimum degree thresholds for spanning subgraphs of directed and oriented graphs*, Joint Mathematical Meetings, AMS Special Session on Graph Theory: Structural and Extremal Problems, January 15, 2014
- *Tight co-degree condition for the existence of loose Hamilton cycles in 3-uniform hypergraphs*, AMS Fall Southeastern Sectional Meeting, Special Session on Extremal Graph Theory, October 6, 2013
- *The semi-degree threshold for anti-directed Hamilton cycles*, AMS Spring Western Sectional Meeting, Special Session on Extremal Graph Theory, April 13, 2013
- *Extending the Hajnal-Szemerédi Theorem to directed graphs*, University of Illinois Combinatorics and Graph Theory Seminar, November 6, 2012
- *Cyclic and transitive triangle factors of directed graphs*, Miami University Graph Theory Seminar, June 6, 2012

### Contributed Talks

- *Triangle factors in graphs without large independent sets*. 30th Midwest Conference on Combinatorics, Cryptography, and Computing, October 16, 2016
- *Triangle factors in graphs, directed graphs and weighted graphs* LMS–EMS Mathematical Meeting, University of Birmingham, September 20, 2015
- *Triangle factors in graphs with large minimum degree and no large independent sets* The 17th International Conference on Random Structures and Algorithms, July 30, 2015
- *Perfect transitive triangle tilings in oriented graphs*, The 27th Cumberland Conference on Combinatorics, Graph Theory and Computing, May 16, 2014
- *Perfect tilings in graphs and digraphs*, Joint Mathematics Meetings, AMS Session on Graph Theory I, January 11, 2013
- *Hajnal Szemerédi and directed graphs*, 26th Midwest Conference on Combinatorics, Cryptography, and Computing, October 11, 2012
- *Oriented 2-factors in directed graphs*, Midwestern Graph Theory (MIGHTY) LIII Conference, September 22, 2012

## Teaching

### University of South Florida

- Introduction to Combinatorics - Fall 2017

### University of Illinois at Urbana-Champaign

- (Graduate Level) Optimization in Networks - Spring 2015
- Linear Programming - Fall 2016, Spring 2016, Fall 2015, Spring 2015, Spring 2014
- Non-linear Programming - Fall 2014, Spring 2017
- Graph Theory - Spring 2016, Spring 2014
- Preparation for Calculus - Fall 2013

## Arizona State University

- (Graduate level) Graph Theory (Assistant) - Spring 2013
  - (Graduate level) Applied Analysis (Assistant) - Fall 2012
  - (Graduate level) Enumerative Combinatorics (Assistant) - Fall 2011, Fall 2010
  - Calculus for Engineers II - Summer 2011
  - Calculus for Engineers I - Spring 2010
  - Calculus with Analytic Geometry II (Recitation) - (3 semesters)
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## Service

- Co-organizer (with A. Bahmanian) of AMS Central Spring Sectional Meeting Special Session “Extremal Problems in Graphs, Hypergraphs and Other Combinatorial Structures”, April 1–2, 2017
  - Co-organizer (with L. DeBiasio) of AMS Central Spring Sectional Meeting Special Session “Extremal Graph Theory: Hypergraphs, Directed graphs, and Other Generalization”, March 14–15, 2015
  - Co-organizer of the Graph Theory and Combinatorics Seminar at UIUC - Fall 2014–Spring 2017
  - Referee for Discrete Mathematics, SIAM Journal of Discrete Math, Information Processing Letters, European Journal of Combinatorics, International Journal of Discrete Mathematics, Utilitas Mathematica, and Journal of Combinatorial Optimization
  - ASU math circle instructor
    - Recurrence Relations and Sorting Networks, February 22 & 29, 2012
    - Polyominoes, November 28, 2012
    - Hat Guessing Games and Hamming Codes, March 25, 2013
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## Additional grants and awards

- Summer Research Grant - Arizona State University, 2009 and 2010.

## Additional degrees

University	Location	Degree	Date
Arizona State University	Tempe, AZ	MS in Computer Science	05/2004
University of Michigan	Ann Arbor, MI	BS in Computer Science	12/1995

## Employment prior to PhD

Employer	Location	Position	Dates
eBay Inc (PayPal)	Scottsdale, AZ	Programmer	04/2006 to 11/2007
General Dynamics / Motorola	Scottsdale, AZ	Programmer	02/1996 to 03/2006