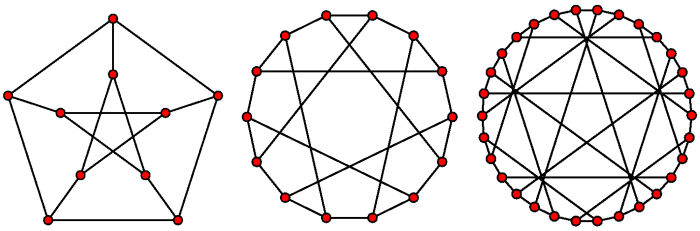

MIDWEST GRAPH THEORY CONFERENCE 52

April 27 - 28, 2012

Indiana State University

Terre Haute, Indiana

Organizing Committee:
Robert Jajcay, Jeff Kinne, Yuejian Peng, and Geoffrey Exoo

Our sponsors:

- College of Arts and Sciences, Indiana State University
- Department of Mathematics, Indiana State University
- Office of the President, Indiana State University
- Sonka Irish Pub, Terre Haute
- First Financial Bank

Program: All talks take place in the beautifully renovated

University Hall, 401 North 7th Street, Terre Haute.

All talks on Friday will be held in *Room 215* [R215]. Saturday talks will be held in Room 215 and the *Whitaker conference room* [WCR].

Invited Speakers:

- *Gabriela Araujo-Pardo*, Instituto de Matematicas, Ciudad Universitaria, Mexico
- *Ted Dobson*, Mississippi State University
- *Tom Tucker*, Colgate University

Schedule:

Thursday	7:30	Informal gathering at Sonka Irish Pub 1366 Wabash Avenue, Terre Haute

Friday	1:30, front of [R215]	Registration
	2:00 - 2:15 [R215]	Official Opening of the Conference
	2:15 - 2:40 [R215]	Reza Akhtar: *Mod n representations of complete multipartite graphs*
	2:40 - 3:05 [R215]	Terry McKee: *k-Partiteness of the Complements of Cographs*
	3:05 - 3:30 [R215]	Dalibor Fronček
	3:30 - 4:00 [R215]	Coffee Break at Jazzman's Atrium of University Hall
	4:00 - 4:25 [R215]	David Anderson: *Animated Graph Theory*
	4:30 - 5:30 [R215]	Ted Dobson: *Vertex-transitive graphs*
	6:00	Dinner at George's Cafe 627 Cherry Street, Terre Haute
	8:00	Informal gathering at Sonka Irish Bar 1366 Wabash Avenue, Terre Haute

Saturday	[WCR]	[R215]
9:00 - 9:25	Xiangqian Zhou (Joe): *Clones in bicircular matroids*	Daniel McDonald: *List and Online List Variations of Vertex Ranking*
9:25 - 9:50	Hao-Hsiang Hung: *Light Spanners with Stack and Queue Charging Schemes*	Thomas Mahoney: *Extending graph choosability results to paintability*
9:50 - 10:30	Coffee Break at Jazzman's	
10:30 - 11:30	Tom Tucker: K_7 *in the torus: a long story*	
11:30 - 11:35	Break	
11:35 - 12:15	Ralph Grimaldi: *Extraordinary Subsets and a Partial Order*	Doug West: *Rainbow edge-coloring and rainbow domination*
12:15 - 1:30	Lunch at Jazzman's	
1:30 - 1:55	Mustafa Atici: *Secret sharing scheme and multipartite graphs*	Ben Reiniger: *Game Saturation Number of Graphs*
1:55 - 2:20	Matt Walsh: *Sliding colours in graphs*	Bill Kinnersley: *Rainbow Spanning Trees in Abelian Groups*
2:20 - 2:45	Chip Vandell: *Making the most of your decycling set*	Steve Butler: *Constructing universal graphs*
2:45 - 3:10	Coffee Break at Jazzman's	
3:10 - 4:10	Gabriela Araujo-Pardo: *Regular and bi-regular cages*	
4:10 - 4:35	David Galvin: *Colouring regular graphs without large independent sets*	Robert E. Jamison: *Long Cycles Represented by Paths*
4:35 - 5:00	John Engbers: *Counting independent sets of a fixed size in graphs with given minimal degree*	Ping Hu: *Upper bounds on the size of* 4- *and* 6*-cycle-free subgraphs of the hypercube*
5:00 - 5:25	John Rickert: *The Jacobsthal Subcube of the Hypercube*	Shariefuddin Pirzada: *On mark sequences of digraphs*

Abstracts for the talks listed alphabetically by the last name of the presenter:

Regular and bi-regular cages

Gabriela Araujo-Pardo

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In this talk, we give a brief summary of the Cage Problem and the relationship between cages of even girth that attain the Moore Bound and generalized polygons. Moreover, we investigate the same problem for bi-regular graphs.

We will present an overview of our results on these topics, and more specifically, the construction of regular and bi-regular graphs with small degree and fixed girth based on the use of geometric concepts and tools. We will emphasize that, in contrast to regular graphs, the bi-regular graphs we obtain using our constructions are best possible – bi-regular cages.

Extending graph choosability results to paintability

Thomas Mahoney

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Introduced independently by Schauz and by Zhu, the *Marker/Remover* game is an on-line version of list coloring. The resulting graph parameter, *paintability*, is at least the chromatic number (the *choosability*). We discuss the extension of various choosability results to paintability. These include the analogue of Ohba's conjecture, bounds on the paintability of complete bipartite graphs, characterization of 3-paint-critical graphs, and equality of paintability and chromatic number for claw-free perfect graphs with no 4-clique.In more detail, we then introduce and study *sum-paintability*, the analogue of sum-choosability.

k-Partiteness of the Complements of Cographs

Terry McKee

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A graph is a cograph if and only if it reduces to an edgeless graph by repeatedly taking complements within components, which is known to be equivalent to every induced subpath having at most two edges. I discuss various sorts of characterizations of those nontrivial connected cographs for which all the nontrivial components of the complement are complete k-partite. For instance, one of several characterizations for the bipartite case is that every induced subtree is a path with at most two edges.

K_7 in the torus: a long story

Thomas Tucker

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The embedding of K_7 in the torus has played an important role in topological graph theory. It is, of course, the first step in the Heawood Map Color Theorem, but it also inspired current maps, voltage graphs, rotation systems, Cayley maps, and chirality for regular maps. We will try to trace out parts of the story, including a little known tale from Jack Edmonds about how a conjecture in Coxeter and Moser about chiral maps led him to rotation systems. We will finish with an absurdly simple proof that regular (reflexible) maps have clique number 2,3,4, or 6, a result previously obtained only through elaborate algebraic arguments.

Sliding colours in graphs

Landan Hicks, Marc Lipman, and Matt Walsh*

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The vertices of a graph G are coloured improperly, but in a way such that some permutation of the colouring will be proper. We want to restore the proper colouring; we can do so by removing the colours on some vertices (creating "holes" in the colouring) and sliding colours from vertices into adjacent holes. What is the minimum number of holes required to restore any such scrambled colouring? We give partial answers to these questions, and discuss some variations on the theme.

Clones in Bicircular Matroids

Xiangqian Zhou (Joe)

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There are two fundamental classes of matroids related to graphs: the well-known one is the class of graphic matroids where a circuit of the matroid is the edge set of a cycle in the graph; the other one is the class of bicircular matroids where a circuit of the matroid is the edge set of a minimal connected subgraph containing at least two cycles of the graph.

Two elements in a matroid are clones if the map that interchanges the two and fixes all other elements is an automorphism of the matroid. Clones have recently become an interesting subject in matroid representation theory. In the talk, we will describe exactly when two elements of a bicircular matroid form a clonal pair. This is joint work with Daniel Slilaty and Jakayla Robbins.