MORNING SESSION PROGRAM

9:00, Bolton 282
• Registration and continental Breakfast

9:50, Davis Auditorium
• Welcome by Alice Dean, organizer, and Mark Hofmann, Associate Dean of the Faculty

10:00, Davis Auditorium
• Karen Collins, Wesleyan University: Graphs and Coloring
  • Abstract: This talk will present a series of theorems and related open questions about graphs and different kinds of graph colorings.

10:50, Bolton 282
• Break

11:10, Davis Auditorium
• Herb Wilf, University of Pennsylvania: Recent progress on Ramanujan's partition congruences
  • Abstract: Ramanujan conjectured and then proved that the number of partitions of an integer $5n+4$ is always divisible by 5. We will describe and prove some new refinements and extensions of those congruences, including recent results of Berkovich and Garvan, Chen, Ji and myself, and Ken Ono.

12:00, Payne Room in Tang Museum
• Lunch

Directions to Payne Room:
• From Davis Auditorium in Palamountain Hall (#3 on map), enter main hallway and turn right, and take stairway at end of hall on left down to 1st floor.
• Turn left from doorway and follow walkway past Scribner Library (#32) on your left and past Case Center (#4) on your right.
• Walk down stairs and past parking lot (gray region below #4) into the Tang Museum (#38).
• The Payne Room will be ahead of you on the left.
AFTERNOON SESSION PROGRAM

2:00, Davis Auditorium
- Ellen Gethner, University of Colorado at Denver: **Unraveling the Chromatic Number of Thickness-Two Graphs**
  - **Abstract:** A graph $G$ is said to have thickness-$t$ if $E(G)$ can be partitioned into $t$ and no fewer planar graphs. A longstanding open problem is the following: What is the largest chromatic number of any thickness-two graph? Here's what is known so far: The largest chromatic number of any thickness-two graph is $hmmm$, where $hmmm$ is one of 9, 10, 11, or 12. The "9" is due to exactly one published example of a 9-critical thickness-two graph. The "12" is due to a straightforward argument that uses Euler's Formula.
  
  I will talk about a catalog of new small 9-critical thickness-two graphs, and a construction that generates infinitely many 9-critical thickness-two graphs, thus providing ballast to the "9." In addition I will introduce new families of thickness-two graphs, (among them, the "permuted layer graphs") and talk about what is known so far about these new class of graphs. Finally, I will give an infinite family of non-trivial graphs for which both the thickness and chromatic number are known. Many open questions will be provided throughout the talk.

  This is joint work with Debra Boutin (Hamilton College) and Thom Sulanke (Indiana University).

2:50 Bolton 282
- Break

3:10, Davis Auditorium
- Bruce Richter, University of Waterloo: **On the Cycle Spaces of an Infinite Graph**
  - **Abstract:** Diestel and Kühn pioneered the study of the cycle space of infinite graphs. A more general point of view was taken by Vella and Richter who showed that many of the earlier results hold for more general spaces, thereby unifying the cycle spaces introduced by Diestel and Kühn and by Bonnington and Richter. In particular, different compactifications of locally finite graphs yield spaces that have cycle spaces.

  In this work, the Vella-Richter approach is pursued to considering cycle spaces over all fields, not just $\mathbb{Z}_2$. In order to understand "orthogonality" relations, it is helpful to consider two different cycle spaces and three different bond spaces. We give an analogue of the "Edge-tripartition Theorem" of Rosenstiehl and Read and show how the cycle spaces of different compactifications of a locally finite graph are related.

  This is joint work with Karel Casteels.

4:00 Bolton 282
- Break

4:20, Davis Auditorium
- Lauren Rose: **Piecewise Polynomials with boundary conditions**
  - **Abstract:** For a $d$-dimensional simplicial complex, $D$, embedded in $\mathbb{R}^d$, and a non-negative integer $r$, we consider the module of piecewise polynomial functions on $D$ that are globally $C^r$. Although these modules are well studied, there are open problems even in dimension two. We give a survey of combinatorial, geometric, and algebraic results, and then discuss what happens when you add boundary conditions.

5:10 End of DMD