

**RYERSON UNIVERSITY**  
**DEPARTMENT OF MATHEMATICS**  
**GRAPHS AT RYERSON (G@R) SEMINAR**

**Edward Lee**

Department of Combinatorics & Optimization, University of Waterloo

Date: Monday, March 6, 2017  
Time: 10am  
Location: ENG 210

## **Circle Graph Obstructions**

### **Abstract:**

A circle graph is the intersection graph of chords on a circle. There is a correspondence between bipartite circle graphs and planar graphs, and hence every characterization for the class of circle graphs gives a characterization for the class of planar graphs.

Bouchet characterized the class of circle graphs as the set of graphs which exclude the 5-wheel, the 7-wheel, and the fundamental graph of the Fano plane as (vertex)-minors. This characterization is akin to Kuratowski's theorem for planar graphs, and one can obtain Kuratowski's theorem as a corollary to Bouchet's theorem via some case analysis.

Bouchet's original proof is long, difficult, and relies on results from isotropic systems. In this talk I will sketch a simpler, more self-contained of Bouchet's excluded (vertex)-minor characterization of the class of circle graphs. Our proof is reminiscent of Gerards' proof of Tutte's excluded-minor characterization for the class of graphic matroids.

This is joint work with Jim Geelen.

**ALL FACULTY, STAFF, STUDENTS AND GUESTS ARE WELCOME TO ATTEND**