

**Speaker:**     **Andrzej Dudek**  
                  Western Michigan University

Thursday, April 11, 2013  
4:00 pm  
Room: 127 Hayes-Healy Hall

**Title:** On the number of regular graphs and hypergraphs

**Abstract:**

It is well-known that there is no simple formula for the total number of regular graphs. Bender and Canfield and also independently Bollobás showed that the number of labelled regular graphs of (fixed) degree  $d$  and order  $n$  with  $dn$  even is given asymptotically by

$$\frac{(dn)!}{(dn/2)!2^{dn/2}(d!)^n} \exp\left(\frac{1-d^2}{4}\right).$$

Subsequently, this celebrated formula was extended by McKay and Wormald to any  $d = d(n)$  that is asymptotically smaller than  $\sqrt{n}$ .

In this talk, we show how to prove such result. Moreover, we derive an analogous formula for hypergraphs. Finally, if time permits, we describe how the discussed techniques can be used in studying the Hamiltonicity of random regular hypergraphs.

This is a joint work with Alan Frieze (Carnegie Mellon University), Andrzej Ruciński (Emory University) and Matas Šileikis (Uppsala University, Sweden).