Symmetry in Graphs - Part II
(Org: **Joy Morris** (University of Lethbridge))

MICHAEL GIUDICI, University of Western Australia
Arc-transitive bicirculants

A graph on $2n$ vertices is a bicirculant if it admits an automorphism that is a permutation with two cycles of length n. For example, the Petersen and Heawood graphs. Arc-transitive bicirculants of valencies three, four and five have previously been classified by various authors. In this talk I will discuss recent joint work with Alice Devillers and Wei Jin that characterises all arc-transitive bicirculants and provides a framework for their complete classification.

KLAVDIJA KUTNAR, University of Primorska
Hamilton paths of cubic vertex-transitive graphs

In 1969 Lovasz posed the problem of constructing a vertex-transitive graph without a Hamilton path. After 50 years no such graph has been found. Only five known vertex-transitive graphs without a Hamilton cycle (but with a Hamilton path) exist: K_2 and four cubic graphs (the Petersen graph, the Coxeter graph, and two graphs obtained from these by replacing each vertex with a triangle). Therefore concentrating on cubic graphs is a reasonable starting point for Lovasz's problem.

In this talk I present recent ideas, and partial results regarding construction of Hamilton cycles in cubic vertex-transitive graphs with a primitive automorphism group.

JOY MORRIS, University of Lethbridge
Almost all Cayley digraphs are DRRs

A Digraphical Regular Representation (DRR) of a group G is a digraph whose automorphism group is G acting regularly on its vertices. A Cayley digraph is a digraph whose automorphism group contains some group acting regularly on its vertices. In 1982 Babai and Godsil conjectured that as n tends to infinity, for every group of order n the proportion of Cayley digraphs on n vertices that are DRRs tends to 1, and proved this for Cayley graphs on some families of groups. I will discuss joint work with Pablo Spiga in which we prove this conjecture.

GABRIEL VERRET, University of Auckland
An update on the Polycirculant Conjecture

One version of the Polycirculant Conjecture is that every finite vertex-transitive digraph admits a nonidentity semiregular automorphism. (That is, an automorphism which, when viewed as a permutation, has all cycles of the same length.) I will give an overview of the status of this conjecture, as well as describe some recent progress with Michael Giudici.