Algebra and Number Theory Seminar

Title: Non–cyclic group ring codes

Speaker: Ian McLoughlin (NUI Galway)

Date: Mon 20th October 2008 at 4:00PM

Location: Mathematical Sciences Seminar Room

Abstract: Cyclic codes are ideals in cyclic group rings (though the term 'group ring' is not usually used in the description of this relationship). The ability to use such a framework in analysing these codes has led to a good understanding of their nature. Recently we have shown that certain non-cyclic codes (that are not ideals in any group ring over a cyclic group) are actually ideals in group rings over a dihedral group. These codes include the extended Hamming (8,4,4) code, the extended binary Golay code and the unique type II (48,24,12) linear block code. In this talk I will discuss the construction of group ring codes in general, and then the construction of those three codes specifically. It is interesting that these codes can be constructed as ideals in this way, because they are closely related to a putative extremal type II (72,36,16) linear block code.