Meeting: 998, Houston, Texas, SS 21A, Special Session on Homological Algebra of Commutative Rings

998-13-251 **Lars Winther Christensen*** (winther@math.ku.dk), Matematisk Afdeling, Universitetsparken 5, DK-2100 Copenhagen O, Denmark, and **Srikanth Iyengar**. *G–dimension of Almost Finite Modules.* Preliminary report.

The G–dimension for f.g. modules over a commutative, Noetherian, local ring R was introduced by M. Auslander in the late 1960'ies. It is a refinement of the classical projective dimension and obeys the so-called Auslander–Bridger formula:

$$\text{G–dim}_R M = \text{depth} R - \text{depth}_R M.$$

This formula has now been extended to almost finite modules: If $\varphi : R \to S$ is a local homomorphism (i.e. mapping the maximal ideal $\mathfrak{m}$ of R into that of S), and M is a f.g. S–module with finite G–flat dimension over R, then

$$\text{Gfd}_R M = \text{depth} R - \text{depth}_R M.$$

Here the G–flat dimension is an extension of the G–dimension to non-finite modules, and $\text{depth}_R M$ is the number of the first non-vanishing $\text{Ext}_R(R/\mathfrak{m}, M)$ module. The talk will outline the proof of this formula; it draws on a number of recent results in the theory of Gorenstein dimensions. (Received February 29, 2004)