Title: Negative immersions, some equations in free groups, and coherence of (most) one-relator groups

Abstract: One-relator groups G=F/<<w>> as a class are something of an outlier in geometric group theory. On the one hand they have some good algorithmic properties, e.g. solvable word problem, but pathological examples abound, and they have therefore been resistant to most of the geometric tools we have available - for instance, small cancellation theory tells us nothing. I will relate the subgroup structure of a one-relator group G to the primitivity rank, a notion introduced by Puder, pi(w) of w, in his work on word maps in free groups. The main tool is a non-abelian "rank-nullity" theorem for equations in free groups which generalizes classic results of Lyndon, Baumslag, Stallings, and Duncan-Howie, and seems to provide a conceptual explanation for some strong analogies between one-relator groups on the one hand and surface and three-manifold groups on the other. This is joint work with Henry Wilton.