

# Collin Bleak

University of St Andrews, School of Mathematics and Statistics,  
UK

**Title:** *On classes of groups defined by classes of formal languages*

**Abstract:** We introduce the classes of finitely generated groups EpiLC, where "LC" refers to a language class such as "Regular", "Context Free", "Context Sensitive", etc., and offer some initial observations on these classes of groups, with particular focus on epiregular groups. In particular, a group  $G$  with finite generating set  $X$  is epiregular if there is a regular language  $R$  on the set  $X$ , so that

- 1) for any word  $w$  in  $R$ , the evaluation of  $w$  in  $G$  as a product of generators is never trivial, and
- 2) for every  $g$  in  $G$  there is some  $w$  in  $R$  so that the evaluation of  $w$  is  $g$ .

Some results are: Being epiregular is independent of the generating set chosen, there are uncountably many finitely generated groups which are not epiregular (indeed, even if we insist of solvable of derived length 3), and stronger still, for any EpiLC group  $G$  with a computable presentation and with LC amongst reasonable classes (regular, context free, context sensitive, recursively enumerable, etc.) the group  $G$  will have solvable word problem. Other results of interest: the class of epiregular groups contains the Right angled Artin groups and even the class of autostackable groups (in particular, R. Thompson's group  $F$ ). Joint with Raad Al-Kohli and Luke Elliott.