

## Professor Said Sidki



Professor Said Sidki's visit will be 1 March - 31 May 2014 hosted by **Professor Sergey Shpectorov** (<http://www.birmingham.ac.uk/schools/mathematics/people/navigation.aspx?Referenceld=9837&Name=professor-sergey-shpectorov>), **School of Mathematics**. (<http://www.birmingham.ac.uk/schools/mathematics/index.aspx>)

Professor Sidki is one of the most prominent Brazilian algebraists, founder of the biannual **Escola de Algebra** (<http://www.algebra.unb.br/>) and is a Member of the **Brazilian Academy of Sciences** ([http://www.abc.org.br/rubrique.php3?id\\_rubrique=2&recalcul=oui](http://www.abc.org.br/rubrique.php3?id_rubrique=2&recalcul=oui)).

The focus of the proposed research collaboration is on the conjecture that Professor Sidki posed around 1990. He wrote down a series of group presentations, in two integer parameters,  $m$  and  $n$ , generalizing a well-known presentation of the alternating groups, and asked whether the resulting groups are always finite. Sidki himself solved some cases for small  $m$  and/or  $n$ . A number of additional cases was completed via a computer calculation. The numerical experiments showed a very interesting picture: when  $n$  is a power of 2, the resulting group seems always to be a 2-group, while for odd prime powers, the calculation seems to produce an orthogonal group of a type depending on  $m$  and  $n$ .

Methods employed in this project are interdisciplinary in nature, not restricted to just algebraic considerations. In particular, geometric and topological ideas, related to the theory of buildings, feature prominently. The project has a significant computational component. In this sense, the proposed project cuts across diverse areas of mathematics and connects to the research in high performance computing.

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