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**Joanna B Fawcett** and **Chase P Vogeli\*** (cpvogeli@mit.edu). *On the Saxl graphs of a family of permutation groups.*

There is a long tradition of constructing graphs that encode interesting properties of groups. Recently, the Saxl graph was introduced by Burness and Giudici to encode information about bases of permutation groups. A base for a permutation group  $G$  acting on a set  $\Omega$  is a subset of  $\Omega$  with a trivial pointwise stabilizer in  $G$ . The base size of  $G$  is the minimal cardinality of a base for  $G$ , and permutation groups with base size 2 are of particular interest. The Saxl graph of  $G$ , denoted  $\Sigma(G)$ , is a graph with vertices  $\Omega$  in which two vertices are adjacent if they form a base for  $G$ . It is conjectured that in the Saxl graph of a primitive group with base size 2, any two vertices have a common neighbor. We consider the Saxl graphs of a family of primitive groups constructed using the natural action of the dihedral group of order  $2p$  on the regular  $p$ -gon for a prime  $p$ . For this family of groups, we prove a strong form of the conjecture, namely that the Saxl graphs are strongly regular. We also determine their automorphism groups, which are related to the unique irreducible 2-dimensional representation of the dihedral group of order 8. (Received September 25, 2018)