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Erica Flapan* (eflapan@pomona.edu), Department of Mathematics, Pomona College,
Claremont, CA 91711. *Topological Symmetry Groups of Molecular Graphs.*

Chemists have defined the *point group* of a molecule as the group of rigid symmetries of its molecular graph in \mathbb{R}^3 . While this group is useful for analyzing the symmetries of rigid molecules, it does not include all of the symmetries of molecules which are flexible or can rotate around one or more bonds. To study the symmetries of such molecules, we define the *topological symmetry group* of a graph embedded in \mathbb{R}^3 to be the subgroup of the automorphism group of the abstract graph that is induced by homeomorphisms of \mathbb{R}^3 . This group gives us a way to understand not only the symmetries of non-rigid molecular graphs, but the symmetries of any graph embedded in \mathbb{R}^3 . In this talk we will present a survey of results about topological symmetry groups and how they can play a role in analyzing the symmetries of non-rigid molecules. (Received November 27, 2011)