

1106-05-1101

**Andrew R Gainer-Dewar\*** ([gainerdewar@hws.edu](mailto:gainerdewar@hws.edu)), HWSC Dept. of Math and CS, 300  
Pulteney Avenue, Geneva, NY 14456. *Species with an equivariant group action.*

We present the theory of  $\Gamma$ -species, which extends Joyal's theory of combinatorial species to incorporate information about "structural" (i.e. relabeling-invariant) group actions, and illustrate how it extends the major algebraic operations on species including  $+$ ,  $\cdot$ ,  $\circ$  (plethystic composition), and  $\square$  (functorial composition). We present an analogue of the Pólya-Redfield Enumeration Theorem which allows counting of "partially-labeled" or colored structures, including quotient structures. We then present some applications of the theory to graph enumeration, including some useful building blocks and some more complex classes of graphs. (Received September 10, 2014)