

1056-57-556

**Daniel C. Cohen** and **Michael J. Falk\*** ([michael.falk@nau.edu](mailto:michael.falk@nau.edu)), Dept. of Mathematics and Statistics, Flagstaff, AZ 86011-5717, and **Richard Randell**. *Representations of arrangement groups*.

We describe a natural homomorphism  $\varphi$  from the fundamental group  $G$  of the complement of a complex projective line arrangement to a product  $A$  of free groups. The image of  $\varphi$  is a normal subgroup of  $A$ , and the cokernel of  $\varphi$  is free abelian. We give a combinatorial interpretation cokernel in terms of flows on a graph, and derive a formula for the rank.

Using a generalization of a result of T. Stanford on Brunnian braids, we derive an easily verified condition for  $\varphi$  to be injective. In this case  $G$  is residually free, torsionfree, residually torsionfree nilpotent, and combinatorially determined. The realization of  $G$  inside  $A$  also yields a precise calculation of the cohomological finiteness type of  $G$ . We demonstrate with several examples. (Received September 12, 2009)