

# Graduate Seminar

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## Geometric group extensions

### Abstract:

Given a topological space  $X$ , the fundamental group  $\pi_1(X)$  is a group which records information about the basic shape of  $X$ . In the event that a group  $G$  acts on  $X$  we can naturally construct a group  $E$  such that  $\pi_1(X)$  is a normal subgroup of  $E$  and the quotient  $E/\pi_1(X)$  is isomorphic to  $G$ . Such a group is called a geometric extension of  $\pi_1(X)$  by  $G$ . We give examples of such groups and, if time permits, discuss the case when  $X$  is a finite graph.