1125-17-2403   **J Hennig*** (`jhennig1@ualberta.ca`) and **S Sierra** (`s.sierra@ed.ac.uk`). *Path algebras of quivers and representations of locally finite Lie algebras.*

We explore the (noncommutative) geometry of representations of locally finite Lie algebras. Let L be one of these Lie algebras, and let $I \subseteq U(L)$ be the annihilator of a locally simple L-module. We show that for each such I, there is a quiver Q so that locally simple L-modules with annihilator I are parameterized by "points" in the "noncommutative space" corresponding to the path algebra of Q. We classify the quivers that occur and along the way discover a beautiful connection to characters of the symmetric groups S_n. (Received September 20, 2016)