1093-16-81 **Susan J Sierra** (s.sierra@ed.ac.uk), University of Edinburgh, Edinburgh, EH9 3JZ, United Kingdom, and **Chelsea Walton*** (notlaw@math.mit.edu), Massachusetts Institute of Technology, Department of Mathematics, Cambridge, MA 02139. *The universal enveloping algebra of the Witt algebra is not noetherian.*

This talk is prompted by the long standing question of whether it is possible for the universal enveloping algebra of an infinite dimensional Lie algebra to be noetherian. To address this problem, we answer a 23-year-old question of Carolyn Dean and Lance Small; namely, we prove that the universal enveloping algebra of the Witt (or centerless Virasoro) algebra is not noetherian. To show this, we prove our main result: the universal enveloping algebra of the positive part of the Witt algebra is not noetherian.

As a consequence of our main result, we also show that the enveloping algebras of many other infinite dimensional Lie algebras are not noetherian. These Lie algebras include the Virasoro algebra and all infinite dimensional Z-graded simple Lie algebras of polynomial growth.

This is joint work with Susan J. Sierra. (Received August 01, 2013)