# JOINT TUFTS/MIT COSMOLOGY SEMINAR

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## *A small weak scale from a small cosmological constant*

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### NYU and IAS

I will present a framework in which Weinberg's anthropic explanation of the cosmological constant problem also solves the hierarchy problem. The weak scale is selected by chiral dynamics that controls the stabilization of an extra dimension. When the Higgs vacuum expectation value is close to a fermion mass scale, the radius of an extra dimension becomes large, and develops an enhanced number of vacua available to scan the cosmological constant down to its observed value. At low energies, the radion necessarily appears as an unnaturally light scalar, in a range of masses and couplings accessible to fifth-force searches as well as scalar dark matter searches with atomic clocks and gravitational-wave detectors. The fermion sector that controls the size of the extra dimension consists of a pair of electroweak doublets and several singlets. These leptons satisfy approximate mass relations related to the weak scale and can be produced at the LHC and future colliders. If time permits, I will also present purely four-dimensional realizations of the framework.

## Tuesday, November 15, 2016, 2:30 pm
## 574 Boston Ave, Room 316
## Tufts University

### Refreshments at 2:00 outside room 304