Topology Seminar

Lars Hesselholt

of Nagoya University and University of Copenhagen will be speaking on

The unreasonable fibrancy of Waldhausen's construction

on May 5 at 4:30 in
MIT Room 2-131

An old result of Gillet and Grayson shows that, to calculate the simplicial loop space of Waldhausen's S-construction of an exact category, it suffices to apply Kan's Ex-functor just once instead of infinitely many times. In this talk, I will explain that, in another instance, Waldhausen's construction turns out to be unreasonably fibrant, namely, that for every exact category with duality (C, D, η), there is a canonical isomorphism $\Omega^{1,1}|NiS^{1,1}(C, D, \eta)| \simeq \Omega^{2,1}|NiS^{2,1}(C, D, \eta)|$ in the homotopy category of pointed real spaces. The proof uses the surprising fact, proved by Schlichting, that, on the set of components of the subspace of the left-hand side consisting of the points fixed by the canonical involution, the abelian monoid structure induced by orthogonal sum is an abelian group structure. It further uses that the real additivity theorem holds for both sides, as proved by Schlichting and by myself and Madsen, respectively, along with a new group-completion result due to Moi.