Semi-infinite Algebraic Geometry

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Abstract: The term "semi-infinite algebraic geometry" means homological algebra in the semiderived categories of quasicoherent sheaves and contraherent cosheaves on certain "doubly infinite-dimensional" algebraic varieties. Informally, a *semi-infinite algebraic variety* is a large and complicated ind-scheme or ind-stack flatly fibered over a variety obtained by a complicated gluing of finite-dimensinal pieces with the fibers obtained by uncomplicated gluing of infinite-dimensional pieces (e. g., in the simplest case, the base may be an ind-scheme of ind-finite type and the fibers may be infinite-dimensional affine schemes). The semiderived category is a mixture of the co/contraderived category along the base and the conventional derived category along the fibers. The theory is supposed to feature a triangulated equivalence between the semiderived categories of quasi-coherent torsion sheaves and contraherent cosheaves of contramodules, and a double-sided derived functor of the semitensor product of quasi-coherent torsion sheaves. Several particular cases will be discussed in the talk.