

MATH 80430: Topics in Topology I  
Chromatic Homotopy Theory  
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The stable homotopy groups of any finite complex admits a filtration, called the chromatic filtration, where the height  $n$  stratum consists of periodic families of elements. This filtration is intimately tied to the algebraic geometry of formal group laws, and via this connection computations in stable homotopy theory can be tied to certain computations in arithmetic geometry. Topics I plan to cover include:

- Brief review of stable homotopy theory
- Quillen's theorem, Complex cobordism, and BP
- Morava K-theory, E-theory, and stabilizer group
- Chromatic spectral sequence
- Nilpotence and Periodicity theorems of Devinatz-Hopkins-Smith
- TMF and  $EO_n$
- telescope conjecture
- unstable  $v_n$ -periodic homotopy (time permitting)
- Lurie ambidexterity (time permitting)