Topological reconstruction theorems

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I will report on joint work with Martin Olsson, János Kollár, and Will Sawin on topological reconstruction theorems for algebraic varieties. Among other things, it appears that proper normal varieties over uncountable algebraically closed fields of characteristic 0 are uniquely determined as schemes by their Zariski topological spaces. This implies various topological analogues of classical coherent reconstruction results, such as Gabriel’s theorem. I will end by stating a conjecture about what happens in positive characteristic.