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Ultrafilters and inner models.

The simplest objects associated to large cardinal axioms are countably complete ultrafilters, but the combinatorics of countably complete ultrafilters in general is largely obscured by independence results. A good example is Magidor's result that it is consistent with ZFC that the least measurable cardinal is strongly compact. The Ultrapower Axiom (UA) is a combinatorial principle motivated by inner model theory under which the general theory of countably complete ultrafilters can be developed satisfactorily. We discuss some consequences of UA, focusing on the result that under UA, the least strongly compact cardinal is supercompact. The main open question is whether UA is consistent with a strongly compact cardinal. (Received August 20, 2018)