We all understand that there is never a guarantee at any given time that we have experimentally identified all the interaction in nature, and the realizations that dark matter and dark energy comprise \( \sim 95\% \) of the energy content of the universe suggest that other interactions with weak couplings to ordinary matter remain to be discovered. We will present some recent experimental work which explores one possibility which has received relatively little attention: new spin-dependent interactions of “mesoscopic” range (millimeters to microns). We will describe three experiments involving polarized neutrons, polarized 3He nuclei, and polarized xenon nuclei which set the most stringent constraints on certain types of weakly-coupled spin-dependent interactions over an interesting range of distance scales.