I will summarize the research efforts of our group in two spin-based fields: (a) The development of ultrasensitive cavity-based polarimetry [1,2] and ellipsometry [3,4], for applications ranging from chirality detection in many fields, parity non-conservation measurements in atoms and molecules, and surface characterization. (b) The production of high-density spin-polarized atoms and molecules [5-7], for NMR signal enhancement, and for the study of spin-dependent collisions and reactions.