Humans are visual beings and therefore optical elements—lenses, mirrors, gratings, optical fibers, etc.—have been playing a pivotal role in almost all aspects of the human society. Conventional optics are however bulky, complicated, and sensitive even to tiny misalignment. Micro-optics promise to overcome these limitations by leveraging standard high-volume microfabrication technologies to realize chip-scale, rugged and low-cost counterparts of conventional optics while delivering comparable or even superior performance. In this talk, Prof. Hu will discuss several new micro-optics innovations we have pioneered in recent years with direct applications to optical spectroscopy, chemical analysis, biomedical imaging, 3-D depth sensing, and AR/VR.