Ever since the discovery of the laser it was recognized that we now had a new tool that could focus energy down to the dimensions of single cells. People immediately began to dream about laser surgery in which the process could be so accurate as to remove a single cell without any affect to neighbouring tissue. However, the reality of its use proved much more difficult. The collateral damage caused by cutting living tissue with a laser was analogous to “boiling” the surrounding tissue, stemming from highly damaging, laser-induced shock waves. In an effort to further understand this, the first “atomic movie” was created, which illustrated how shock waves could be completely avoided when a laser pulse of a particular duration interacts with matter. This discovery has led to the development of the Picosecond InfraRed (PIRL) scalpel, a tool that readily cuts all tissues types and most importantly, the damage to surrounding tissue is negligible, with no discernable scar tissue formation – and stronger tensile strength than scar tissue. This research has also paved the way to molecular level pathology during surgery, which is a very real and promising future.

Please join us for Dr. Miller’s lecture where he will discuss the revelations and process of this research, and what is next in this dynamic field.