Ultrafast Mode-Locked Semiconductor Disk Lasers

Name/Contact of Project: Jerome V. Moloney, Ph.D.

Project Description: The research groups under my direct supervision carry out a mix of theory/simulation and/or experimental studies in the field extreme nonlinear optics. The main thrust of the theory/simulation effort is to understand the complex nonlinear interactions that occur on ultra-short time scales in gases and condensed media. The experimental programs support and are guided by research outcomes of the theory effort. The project will focus on an experimental project and involve working with an experienced graduate student mentor and postdoctoral fellow in the laboratory on the characterization of laser chips and saturable absorber mirrors, setting up a laser cavity and running in-situ diagnostics on running mode-locked lasers.

Required Skills: Basic hands on undergraduate optics/physics laboratory training up to junior level.

Ideal Skills: A student with strong skills in the above could quickly progress to running ultrafast pulse diagnostics including FROG, autocorrelators and carry out synchronized active pump-probe studies of the running femtosecond laser pulses.