Master thesis

Implementation of a near IR detection transient absorption setup (NIRTAS)

Research topic	The primary photophysical and photochemical reactions of light energy transformation in photoactive molecular systems and nanostructures occur on timescales from tens of femtoseconds to about a nanosecond. The most widely employed method for investigating the mechanism of these reactions is transient absorption spectroscopy. In this method, a sample is excited by an intense, ultrashort, narrowband laser pulse, while a weak broadband pulse probes the absorption changes of the sample as a function of time and wavelength. Light-activatable drugs are getting designed to absorb in the biological window (700-1000 nm), where no damage to cell is done. Shifting the activation wavelength to lower energy photons also increases the penetration depths. The detection of an usual ultrafast transient absorption set ups ranges from 350 nm to 740 nm and is not suitable for these applications. Therefore, a near IR (700-1300 nm) detection transient absorption setup is of great technological interest.
Thesis milestones	Implementation of: i) the second NOPA (rebuilding) ii) a SFG (with Delay Stage) (optimizing) iii) white light continuum generation iv) sample compartment stage v) spectrometers for signal detection First measurement of a sample