Development and characterisation of an Nd: YAG pumped wavelength tunable VUV light source

Laser light in the vacuum ultraviolet spectral range was generated by focussing two visible laser beams into magnesium vapour. This source provided a vacuum ultraviolet intensity 440 times higher than previously available. Evidence was found for several nonlinear optical processes playing a role in the conversion process at high input power. The source was applied to measure rovibronic excitation spectra of carbon monoxide molecules, with individual rotational lines resolved. It facilitated the detection of forbidden spectral lines and calculation of molecular constants that are important to space science, as carbon monoxide is the second most abundant molecule in space.

Supervisor: Dr CM Steenkamp

Co-supervisor: Prof EG Rohwer