

## **Abstract**

Silk fibroin has been proven to be a remarkable biomaterial and various material formats such as thin films, sponges, hydrogels, thin tubes, electrospun fibers have been processed from it. In this thesis, we extracted fibroin from the silk cocoons to make aqueous solution of the silk and used it in characterization of bombyx mori silk fibroin by using techniques like Raman spectroscopy, Ultraviolet-visible spectroscopy and X-ray diffraction crystallography. We used this solution to study the nanoscale deformations in the silk drop with time using pumpprobe technique on Liquid Drop Interferometer set-up. Both radiation pressure effect, in agreement with Minkowski's momentum, and thermal effect were observed on the silk drop. We calculated change in surface tension and thermal diffusivity using radiation pressure effect and thermal effect, respectively.