Quantum dots are nanocrystalline semi-conductive dot like structures that exhibit quantum mechanical properties. These structures have applications to solar cells, photon detectors, diagnostic imaging. One of the most promising ways to create quantum dots and other nanostructures is through noble gas ion bombardment. However, there is no current complete mathematical model, which can accurately predict nanostructure features based on the target material, ion energy, incident angle, temperature and a number of other parameters. In order to contribute to early stage nanostructure surface morphology modeling, Gallium Antimonite (GaSb) was first etched with a HCl solution and irradiated using Ar+, Kr+, Xe+ and Ne+ plasmas at 500 eV while a 0.2 degree10 keV incident photon beam gave real time surface-structuring analysis through Grazing Incidence Small Angle X-Ray Spectroscopy (GISAXS). All irradiations produced quantum dot structures on GaSb, evident by the symmetrical peaks in the parallel space (Fourier transform of reflected intensity) GISAXS plots. The exact arrangement of these structures needs to be confirmed with SEM, but the amplitude of the dots as well as the spacing appears to vary with the incident ions used. Photoluminescence testing will hopefully reveal increased photon absorption in the UV range. The photoluminescence results will hopefully reveal photon detection applications, while the overall analysis over the structures will contribute to producing an accurate mathematical model.