**Prelab #4: X-Ray**

1.0 Watch the videos and read the manual first, and record how much time you spent on this effort (2pt)
~10mins

1.1 Summarize the experiment in no more than 5 sentences: What physics phenomenon are you investigating, what will you be measuring (observables), what physics constants will you be determining from this experiment (2pt)

We use a Cu X-ray tube and a NaCl crystal to study X-ray diffraction. We rotate the detector and crystal, record counts vs angle, and look for peaks where Bragg's law is satisfied. The observables are count rate and the peak positions in 2θ. From the peak angles we determine the lattice plane spacing d for NaCl and identify the Cu Kα and Kβ lines.

1.2 Note that the angle you record during the experiment, let's call it $\phi$, is actually $2\theta$, with the $\theta$ being the incident angle appearing in the Braggs Equation $2dsin(\theta) = n\lambda$ . For one of the Characteristic wavelength you observed a maximum count (constructive interference!) at $\phi$ =30.0 degrees.

A. Predict where --- please! Do NOT answer 60 degrees! --- you should be observing the second maximum count for that same wavelength. (2pt)
B. What about the third? (2pt)
C. Is it possible to find a fourth peak? Either way please explain. (2pt)