# GX 13+1 Dust Scattering Halo

## Observation plan

Pointing 1: 40 ks, on-axis observation of GX 13+1 with Neutral Density Filter (NDF), Xtend in ⅛ window + 0.1s burst mode.

Pointing 2: 50 ks, 3 arcmin off-axis observation of GX 13+1 with open filter, Xtend in full window mode (possibly with 0.1s burst mode).

Roll Angle for Pointing 2: We are attempting to orient the Resolve chips so that it stays in the shadow of the mirror support structures. A roll angle on the order of 45, 135, 225, or 315 (+/- 15 degrees) should be fine. We will finalize this decision in consultation with the XMA calibration team.

The final Xtend observational setup needs to be finalized by consultation with the Xtend team.

## Immediate objectives

[1] Measure the intensity of the scattering halo relative to the point source in order to measure the abundance of large (0.5 micron scale) dust grains in the diffuse ISM.

[2] Apply laboratory templates of astrosilicate materials to the Si K shell X-ray Scattering Fine Structure (XSFS) features in the GX 13+1 scattering halo to identify the dust compounds responsible for X-ray scattering by the ISM.

[3] Search for XSFS from Mg K shell (1.3 keV, visible in Chandra HETG) to further constrain the mineralogical compound responsible for X-ray scattering by the ISM. A simultaneous fit to the Si K and Mg K shell XSFS will provide the best possible mineral identification.