(right) X-ray diffraction data collected at Villanova for \((\text{Sr}, \text{Ca})\text{FeO}_x\) perovskite-based materials, exhibiting a gradual reduction in crystal symmetry with increased doping.

(left) The distorted orthohombic unit cell of \(\text{CaFeO}_{2.5+y}\) plotted in VESTA. The 'A' sites are calcium ions (blue), the 'B' site are iron ions (tan), and the 'X' sites are oxygen ions (red).

(above) The cubic unit cell of the \(\text{SrFeO}_3\) perovskite structure. The 'A' sites are strontium atoms, the 'B' site is an iron atom, and the 'X' sites are oxygen atoms.

(left) Powder X-ray diffraction experimental setup using the Bragg-Brentano scattering geometry.