



Sunrise Tippecanoe County Indiana, 6 January 2014 . Surface air temperature is -15F. Optical phenomena produced by flat hexagonal ice crystals or plates, as well as hexagonal pencil crystals, consisting of a) *solar pillar*, produced by reflection of light from “horizontal mirrors” or plates, and b) *sun dogs*, c) *halo*, d) *upper arc* above solar pillar, all produced by refraction of light from both hexagonal plates and pencil hexagonal crystals. Color spectrum of light is distinctly present in both sun dogs. Photo taken inside shows a window reflection, which is not a part of the solar optical phenomena. ( Contributed by E.Agee, Department of Earth, Atmospheric and Planetary Sciences, Purdue University.)