

**Prolonged Acadian Orogenesis:
Revelations from Foliation Intersection Axis (FIA)
Controlled Monazite dating of Foliations in
Porphyroblasts and Matrix.**

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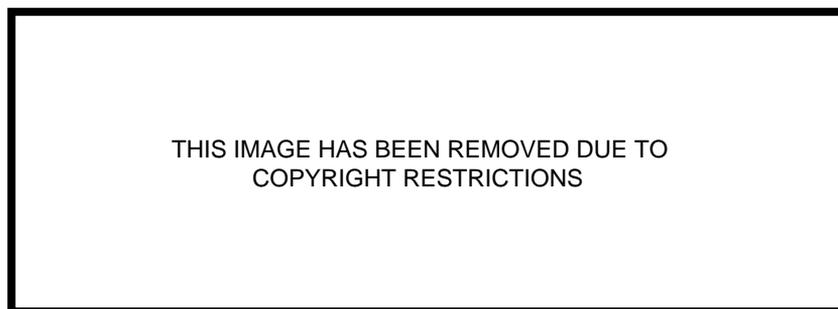


Figure 1A. Location of the region around the Chester and Athens domes (marked by rectangular box). (b). Geological map of the region around the Chester and Athens domes in SE Vermont. Geology after Doll and others, (1961); Em (1963); Hepburn and others, (1984); Stanley and Ratcliffe, 1985; Thompson and others, (1990); Ratcliffe and others, (1992); Ratcliffe (1993, 1995a, b); Ratcliffe and Armstrong (1995, 1996).

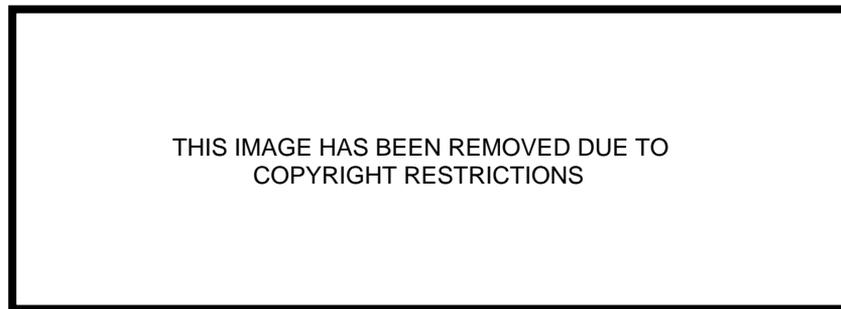


Figure 2. Geological Map of the Spring Hill Synform showing the location of the samples dated. The location of this figure within the region around the Chester and Athens domes is shown in figure 1B. Main lithological relationships and structural features are those of Ratcliffe and Armstrong (1995, 1996) with some modification based mapping T.H. Bell and K. Hickey in the area. TT = Townshend thrust.

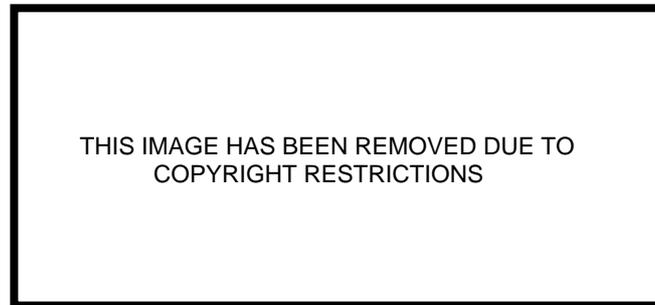


Figure 3. Outline map of bedding across the Spring Hill synform showing the trends of successive FIA sets on each limb (modified from Bell and Hickey, 1997).

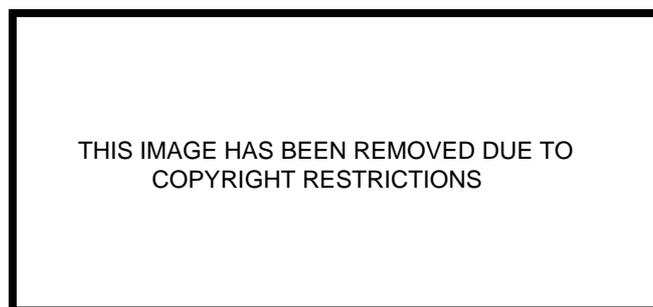


Figure 4. Rose diagram showing the succession of four FIA sets within garnet porphyroblasts determined within the region around the Chester and Athens domes by Bell et al. (1998). The FIA sets trend successively SW-NE, W-E, NNW-SSE and SSW-NNE as shown. The SW-NE FIA set occurs on the edge of the large SSW-NNE set and is obscured by it because few samples preserve it. It is shown as an inset. See text for how it was separated from Set 4.

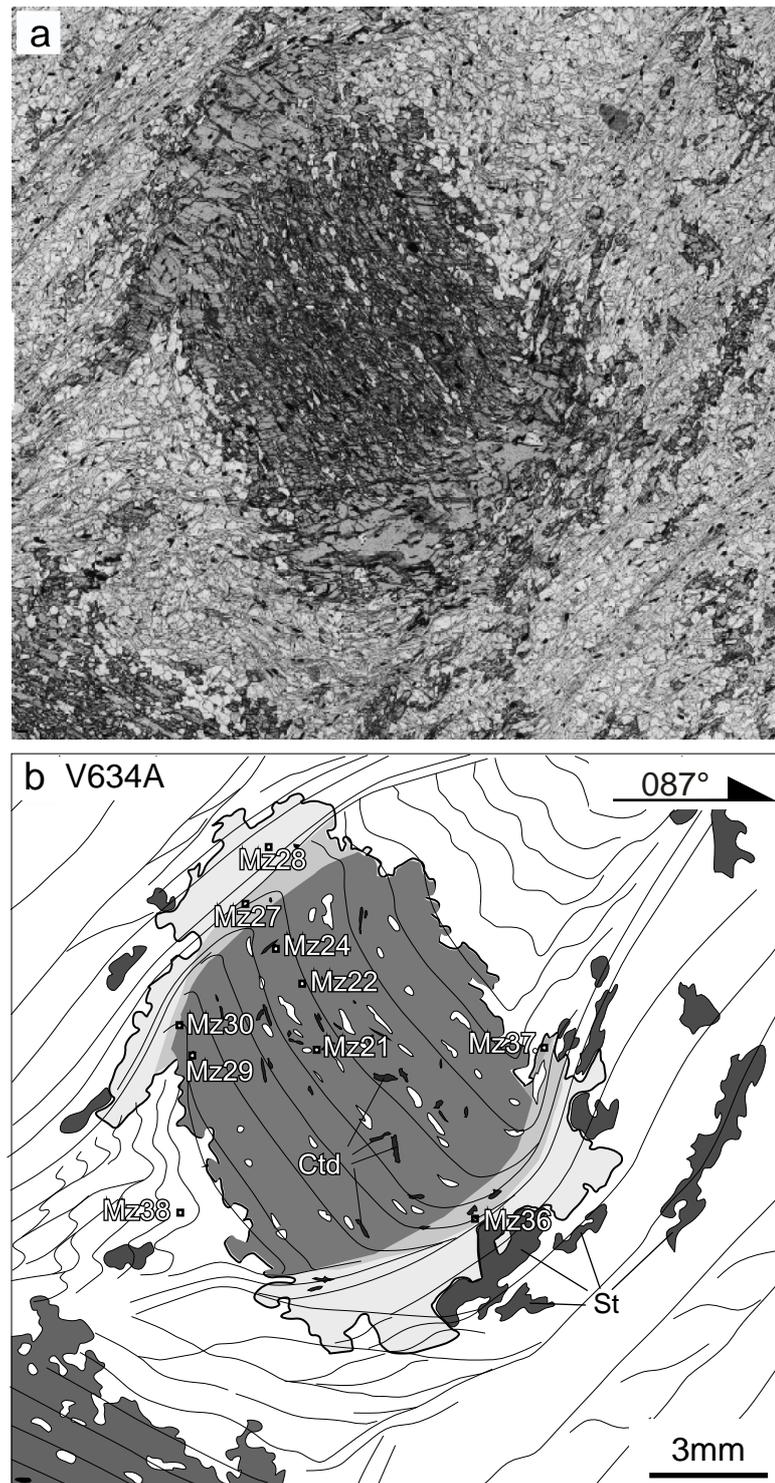


Figure 5. Plane polarized light photograph (a), line diagram (b) and Mg, Ca, Mn and Al compositional zoning maps (c) of a garnet porphyroblast from Sample V634A in a vertical thin-section showing strike and way up (single barbed arrow) and scale bar shown in (b). The location of monazite grains within foliations preserved as inclusion trails in the cores and rims of garnet porphyroblasts and in the matrix are shown in (b). Shades of grey are used to denote different stages of garnet growth related to FIA development. This sample contains FIA set 1 preserved within the foliation across the core, set 2 within in the curvature of the core foliation, set 3 in the median and set 4 in a portion of the outermost rim. Monazite ages range from 431 Ma to 366 Ma. Grains Mz38 lies in the strain shadow of the porphyroblast core.

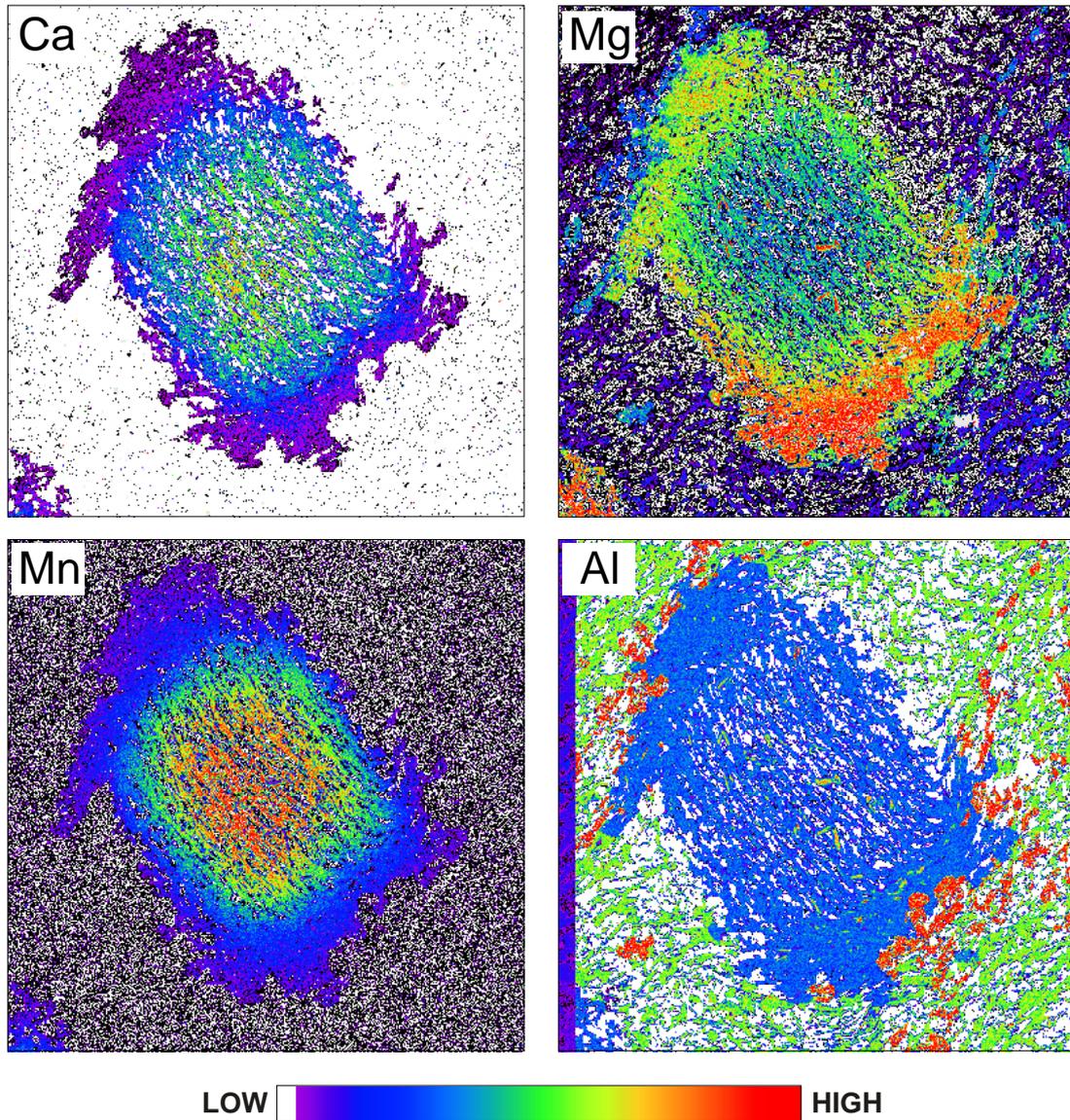


Figure 5c. X-ray compositional maps (Mg, Ca, Mn and Al) for the garnet porphyroblast from sample V634A. Colors represent relative concentrations.