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## Northeastern Section - 50th Annual Meeting (23–25 March 2015)

Paper No. 38-5

Presentation Time: 8:00 AM-12:00 PM

### PETROGRAPHY, GEOTHERMOBAROMETRY AND METAMORPHIC HISTORY OF METAPELITES FROM THE CENTRAL RUBY RANGE, SOUTHWEST MONTANA

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The Ruby Range is one of several uplifted Precambrian blocks in southwest Montana, near the northwestern margin of the Archean Wyoming province. It was metamorphosed during the Big Sky orogeny ~ 1.72-1.79 Ga (Baldwin et al., 2014; Cramer et al., 2013). This study seeks to characterize further the P-T metamorphic conditions of the Big Sky orogenic event as recorded in the central Ruby Range. Metapelite samples were collected during July 2014 as part of a Keck Geology Consortium summer research project. Garnet-biotite-sillimanite-bearing metapelite rocks associated with marble, amphibolite and metamorphosed banded iron formation were sampled from the Christensen Ranch Metamorphic Suite at the highest structural levels of the central Ruby Range near Stone Creek. Textures and mineral assemblages preserve evidence for partial melting with quartz- and feldspar-rich neosome domains and restitic, sillimanite-rich paleosome domains. All samples contain the assemblage biotite+garnet+sillimanite (+quartz), consistent with upper amphibolite facies metamorphism. Sillimanite occurs primarily as bundles or lenses of fibrolite of variable sizes. In rare cases, the rock fabric presents two different fibrous sillimanite orientations, one as a rim around the other. One sample contains prismatic sillimanite. Garnet is generally anhedral, ranging from 0.3 mm – 10 cm in size with biotite, quartz, sillimanite, K-feldspar, albite and apatite inclusions. A goal of the combined petrographic and geochemical SEM/EDS analysis of these samples is to determine P-T metamorphic conditions for the Big Sky orogeny as recorded in metapelites. Bulk rock chemical analyses for major and trace elements are in process for protolith characterization, and for P-T path construction using a pseudosection approach. This study will complement previous studies in the adjacent Tobacco Root Mountains and Gravelly Range to understand more fully the metamorphic and tectonic evolution of this region during the Paleoproterozoic.

#### References:

<https://gsa.confex.com/gsa/2013AM/webprogram/Paper232804.html>

<https://gsa.confex.com/gsa/2014RM/webprogram/Paper238773.html>

#### Handouts

- [chamelin\\_NEGSA\\_031915.pdf](#) (17.8 MB)

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Tuesday, 24 March 2015: 8:00 AM-12:00 PM

Presidential Ballroom (Omni Mount Washington Resort)

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