

# **GRAND JUNCTION GEOLOGICAL SOCIETY**

[www.gjgs.org](http://www.gjgs.org)

## **OCTOBER MEETING**

**WEDNESDAY, OCTOBER 21, 2020**

**Joint meeting with the CMU Geology Students**

**7:30 PM**

**Room 104, Houston Hall**

**(Location 16 on the attached campus map)**

**Richard G. Warren**

**Comprehensive Volcanic Petrographics LLC**

**Grand Junction, Colorado**

**Will Speak On**

**“Magmatic Evolution and Heterogeneity, and  
Subsequent Alteration of Volcanic Rocks as Revealed  
by Quantitative Petrographic Analysis”**

**Abstract at the end of this announcement**

**Due to social distancing, seating is limited**

**The meeting will also be presented via Zoom, details on next  
page**

Andres Aslan is inviting you to a scheduled Zoom meeting.

Topic: Oct 21 GJGS meeting

Time: Oct 21, 2020 07:00 PM. It often takes a while to log in, so this gives you time to log in before the actual meeting starts at 7:30.

To join the Zoom Meeting

<https://coloradomesa.zoom.us/j/95359750694?pwd=OTY0L0NJT3grS055SkFnemtxOGIrdz09>

Meeting ID: 953 5975 0694

Passcode: 965300

One tap mobile

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+1 669 900 6833 US (San Jose)

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**Abstract of Presentation on Next Page**

# Magmatic Evolution and Heterogeneity, and Subsequent Alteration of Volcanic Rocks as Revealed by Quantitative Petrographic Analysis

R.G. Warren

To characterize geology of vast, primarily rhyolitic Southwestern Nevada Volcanic Field, Frank Byers applied quantitative petrographic analyses of volcanic rock to support extensive field mapping and lithologic logging of drill holes. Los Alamos geochemists added trace element analyses by neutron activation and X-ray diffraction analyses, and I joined Frank to provide supporting quantitative petrographic analyses, adding reflected light optics and developing methods to analyze trace components. Documentation of each individual component used in such analyses, plus electron microprobe analysis of these components enables accurate identification and fingerprinting of minerals. Views of components, paired in transmitted and reflected light, will illustrate important characteristics of rhyolitic volcanic rocks, particularly their mode of fragmentation into shards, pumice, and hydroclasts, evidence for frequent injection of primitive magma, and subsequent effects of alteration. Together with additional field mapping and Ar/Ar age dating by USGS, our body of work has defined more than 350 Miocene volcanic units within the volcanic field. Isotopic analyses by Lang Farmer and students established that injection of primitive magma triggered eruption of voluminous ignimbrite eruptions; plots of chemical plus quantitative petrographic analyses versus Ar/Ar ages show that such injection occurred far more extensively. Additional discoveries include history of resurgence of Timber Mountain Dome and extents and character of buried pre-Timber Mountain calderas. These data are served online at USGS website for Data Series 297, together with a vast set of analytical and descriptive information used to assure that underground tests of nuclear weapons were fully contained and thus in no way threatened public safety.