GES 211 (Topics in Regional Tectonics)
GES 291 (Field Trips in advanced topics). Leave Monday September 8 returning Saturday September 20, 2014, Raft River Range, Clear Creek Forest Service Campground (sign up for Fall). Take your pick, you can sign up S/NC and for 1-3 credits BUT if you want a grade it must be 3 credits and you need to discuss follow-up work with instructor. You can also sign up for research credits under Miller.

GEOCHRONOLOGIC PROBLEMS IN METAMORPHIC CORE COMPLEXES: A microstructure and field research course

Stretched pebble conglomerate (left) and kyanite in thin-section (above), Elba Quartzite, Clear Creek, Raft River Mountains (field site GES291)
GEOCHRONOLOGIC PROBLEMS IN METAMORPHIC CORE COMPLEXES: A microstructure and field research course

Substantial controversy surrounds the ages of metamorphic and structural events in the Albion-Raft River-Grouse Creek Mountains core complex in Utah and Idaho. Multiple thermal and deformational events have conspired to produce rocks and metamorphic mineral assemblages that are not easily amenable to placing tight geochronologic constraints on these events, resulting in many different interpretations of their regional significance. This class represents a rare opportunity to learn about and contribute to the solution of the problems represented by the existing geochronology of this region. The area is unique in that it is accessible, has a rich legacy of prior work, with many students and faculty contributing over more than 40 years of work. It is also an opportunity to “learn by engagement” where the literature review of previous work can be augmented by microstructural studies and observations of thin-section sets that are part of our Stanford collection. The trip described here is a must for field geologists, structural geologists, microstructural geologists, metamorphic petrologists and geochronologists and provides a showcase of a wide variety of work and approaches to difficult problems, many with conflicting results!
GEOCHRONOLOGIC PROBLEMS IN METAMORPHIC CORE COMPLEXES:
A microstructure and field research course

GES 291: IN THE FIELD

The field trip part of this class will include an overnight stop at Angel Lake in the migmatitic core of the Ruby Mountains, Nevada. We will visit controversial localities in the ARG metamorphic core complex (2 days), sample a structural section for geochronology and thermochronology (1 day) and the remainder days in the field will be spent carrying out geologic mapping together with sampling to determine the answer to the following questions: What is the age and tectonic setting of kyanite growth in the Elba Quartzite in Clear Creek of the Raft River Range? Are there younger plutons (and what age) that lurk unmapped in the Precambrian Green Creek Complex (~2.5 Ga) in Clear Creek?
Bewildering arrays of geochron data have been collected from the ARG. What is meaningful and what is not? How do you determine/decide/sample rocks to straighten the this story out?

Figure 4: Summary of Mesozoic-Cenozoic geochronology from the Albion-Raft River-Grouse Creek metamorphic core complex. Sources: (1) Smith, 1982; (2) Wells et al., 1990; (3) Wells et al., 1998; (4) Wells et al., 2000; (5) Egger et al., 2003; (6) Kelly et al., 2003; (7) Cruz-UrIBE et al., 2007; (8) Hoisch et al., 2008; (9) Wells et al., 2008; (10) Strickland et al., 2011a; (11) Strickland, et al., 2011b; (12) this study; (13) Wells et al., 2012.