

Analytical Seminar
Thursday, Feb. 17, '11
12:15 p.m. in room 1315

Professor John Valley

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Zircons from Hell?

The earliest Earth was highly energetic and had a steam-rich atmosphere, but how long did “hell-like” conditions last and what came next? The oldest known rocks formed at ~4 Ga (giga-annum old) and are 0.5 Ga younger than Earth. The only direct evidence of earlier events comes from tiny grains of the mineral zircon as old as 4.4 Ga. These ~100 μ m crystals present special analytical challenges, but yield answers to longstanding questions. Are the pre-4 Ga zircons evidence of early granites, continents, and plate tectonics? When did Earth’s surface cool? Why are there no known rocks older than 4 Ga, but zircons have survived? When did Earth become habitable to life? Results from the WiscSIMS Lab at UW suggest that oceans existed and conditions were relatively clement before 4.325 Ga, possibly as early as 4.4 Ga. The first life may have been almost 1 billion years earlier than the oldest microfossil evidence.