

## Forum: Ocean and Continent Formation on the Early Earth

Title: "Evidence for the earliest Hydrothermal System on Earth in the East Pilbara Granite-Greenstone Terrane"

Name: Adrian Brown

Affiliation: Dept of Earth and Planetary Sciences, Macquarie University

Time when the process you describe started in the solar system: 3.45 Gy

The error bar on the start time: 100 My

Time when this process ended: 3.46

The error bar on the end time: 100 My

The 100 to 300-word abstract:

The East Pilbara Granite Greenstone Terrane is a well preserved Archaean succession of domical granite batholiths surrounded by thick greenstone synclinoria. The North Pole Dome region is postulated to be a granite dome predominantly covered by greenstones of the Warrawoona Group. Following intrusion of the granite and eruption of the felsic Panorama Formation around 3.45 Gya, it is hypothesized that a hydrothermal event took place, utilising the felsic magma conduits to propel water to the palaeosurface, thereby creating an epithermal hydrothermal deposit at Miraglia Creek. The alteration caused by this event is in the process of being mapped using airborne hyperspectral sensing as part of a three year PhD project. It provides an opportunity to examine one of the earliest hydrothermal events in the history of the Earth.

The 600 sq. km hyperspectral dataset was captured in October 2002 and covers the wavelengths from 400 to 2400 nm at 5m resolution. Mapped lithologies so far include sericite, chlorite and pyrophyllite alteration zones, along with a serpentine-rich komatiite flow at the base of the Apex Basalt. These will be discussed and implications of the event, including its possible links with putative stromatolite structures within the 3.42 Gyr Strelley Pool Chert, which overlies the Panorama Formation.