Postdoctoral Position in Astrobiology  June 2015

University of Wisconsin-Madison, WiscSIMS Laboratory  
http://www.geology.wisc.edu/facilities/wiscsims

This position is sponsored by the NASA Astrobiology Institute. Research into the early evidence and environments for life will include in situ analysis by ion microprobe (IMS-1280, see below) of S 3- and 4-isotope ratios in Archean pyrite and C, S, Si, and O isotope ratios in associated minerals and organic matter. One area of emphasis will be 3.4 to 3.5 Ga cherts from the Pilbara Craton in Western Australia. Interest in collaborative interdisciplinary research is required. Experience with astrobiology, Precambrian geology, stable isotope geochemistry, SIMS, SEM, EPMA, or mass-spectrometry is desirable.

Please submit by e-mail a cover letter, reprints of papers, and a CV with the contact information of 3 or more potential references to John Valley, Dept. of Geoscience at valley@geology.wisc.edu. UW-Madison is an Equal Opportunity Employer.

Fig. 1. Improved techniques for in situ $\delta^{13}C$ analysis of individual microfossils are employed at WiscSIMS. Backscattered electron (a,b) and transmitted light (c,d) images showing SIMS carbon isotope analyses of Leiosphaerida crassa (a,c) and Myxococcoides sp. microfossils located 8 mm apart in a single sample from the 650 Ma Chichkan Formation. Carbon isotope ratios (‰, VPDB) and individual analysis numbers are shown next to analytical pits; average and total range of $\delta^{13}C$ is indicated at top right in (a) and (b). Scale bars are 50 µm in all panels. L. crassa has $\delta^{13}C$ consistent with eukaryotic photosynthesis, whereas Myxococcoides sp. has $\delta^{13}C$ consistent with cyanobacterial photosynthesis. (from Williford KH et al. (2013) see below).
Fig. 2. Compilations of $\delta^{34}\text{S}$ (a) and $\Delta^{33}\text{S}$ values (b) including previously published data (open circles) and WiscSIMS data (filled circles). Only sulfide data are shown in (a), whereas sulfide and sulfate data are shown in (b). Enlargement in (b) shows the critical time interval for atmospheric oxygenation. $\Delta^{33}\text{S}$ data shown from this study exclude pyrite of detrital or ambiguous origin. Figures are adapted from previously published compilations (Canfield and Farquhar, 2009; Domagal-Goldman et al., 2008; Farquhar et al., 2007) and incorporate more recent data (Ono et al., 2009; Papineau et al., 2007; Ueno et al., 2008; Williford et al., 2009; Wu et al., 2010). (from Williford KH et al. (2011), see Ushikubo et al. (2014), BELOW)

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