

A possible airburst event as the origin of Taihu Lake, China ~7000 years ago

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We propose that an airburst event likely happened ~ 7000 years ago in Taihu Lake area. This interpretation is supported on the occurrence of iron-rich concretions found within a marked silty layer in the lake basin. Several hypotheses for the origin of Taihu Lake have been proposed, and these include a lagoon [1], tectonic processes [2], and a dammed lake [3]. The southwestern arc of Taihu Lake has cast doubt that the lake was formed by a meteorite impact [4,5], and an impact origin has been thought to be inconsistent with the very shallow depth (3 m) of Taihu Lake. The discovery of unique siderite concretions plus iron-rich spherules within a marked silty layer helped revive the impact hypothesis [6], and further-deep work led to the airburst-impact hypothesis [7,8].

The iron-rich concretions of Taihu Lake are not volcanic lapilli, nor are they traditional Fe-Mn nodules, or aqueous deposition and hydrosol products. On the other hand, they are similar to accretionary lapilli, more likely formed in an aerosol environment and can be considered fallouts from the impact plume, which might lead to the hypothesis of the origin of the Taihu Lake basin being an airburst impact. More and more data show that the airburst-impact hypothesis is reasonable to explain the observation of the iron-rich concretions in the marked silty layer [9].

References: [1] Chen, Yu, Yun (1959), *Acta Geographica Sinica* 3, 201-220(in Chinese). [2] Huang, Yang, Liu, Mei (1965), *Oceanologia Et Limnologia Sinica* 4, 396-426(in Chinese). [3] Sun & Wu (1987), *Chinese Science Bulletin* 12, 1329-1339(in Chinese). [4] He, Xu, Lu, et al. (1990), *Chinese Science Bulletin* 15, 1163-1166 (in Chinese). [5] Wang, Wan, Shi, et al. (1993). *Chinese Science Bulletin* 20, 1875-1878(in Chinese). [6] Wang, Xie, Qian (2009), *Geological Journal of China Universities*, 4, 437-444 (in Chinese). [7] Zuo & Xie (2021a), *Geological Journal of China Universities* 2, 172-182(in Chinese). [8] Zuo & Xie (2021b), *Minerals*, 11, 632. [9] Zuo & Xie (2021c), *Acta Geologica Sinica* 9, 2920-2935(in Chinese).