TEKTITES AND MICROTEKTITES IN CHINA. Jiang Pu[1] and Zhiyong Xiao[1, 2], [1]Planetary Science Institute, School of Earth Science, China University of Geosciences (Wuhan), [2]Space Science Institute, Macau University of Science and Technology (zyxiao@cug.edu.cn)

Introduction: Tektites are pure glass formed from melted target surface materials during impact cratering events. Three types of tektites have been recognized [1]: (1) Muong-Nong tektites, (2) splash-form tektites, and (3) ablated splash-form tektites. Muong-Nong tektites are large (up to kilograms), blocky, and with internal layers, which are believed to be close to the source crater [2]. Splash-form tektites are formed by smeared impact melt and they have various shapes, which are caused by rotation during flight and subsequent etching. Ablated splash-form tektites are tektites that have undergone secondary melting (as typical evidence by marginal flange) during the ascending or descending through the atmosphere [1]. So far, in the frame of impact cratering process, the formation mechanism of the source melt that formed tektites is still not confirmed, but jetting and spallation have been both referred [3, 4]. On Earth, tektites are mainly found in four strewn fields, which are the North American, Central European, Ivory Coast, and Australasian strewn fields with age of 35, 15, 1.1, and 0.7 Ma, respectively [1]. The Australasian strewn field is the youngest and largest one on Earth, which covers at least one tenth of the Earth surface [5]. However, the source crater of this strewn field has not been confirmed, and this problem is a persistent enigma in Earth and planetary sciences. We have been searching for potential impact craters in China [6], and the source crater of the Australasian strewn field is one of the research targets.

The northern boundary of the Australasian strewn field (25.27°N) is currently believed to be located in China. Tektites in China are mainly found in the Guangxi, Guangdong and Hainan provinces. Except for ablated splash-form tektites (which are mainly found at Java and Australia), the other two types of tektites have been both discovered in China (Figure 1). The morphological, lithology and geochemistry characteristics of tektites are directly related with their origin, which are importance clues to reveal the source crater and for understanding the formation process of tektites [2, 7]. These characteristics of both Muong-Nong and ablated splash-form tektites have been extensively studied. However, no *in-situ* tektites have been reported in China, and the relationship between surface morphology and formation process of splash-form tektites has not been well studied. For example, the extensive linear structures and pits on the surface of tektites could be formed by aerodynamics and/or degassing or post-sedimentation etching, and such possibilities have not been rigorously tested for tektites in the Australasian strewn field. More importantly, although previous studies have reported tektites and microtketites in areas to the north of the present northern boundary of the Australasian strewn field (e.g., within the Chinese losses), their identity has not been confirmed [8].

We have carried out field studies at both the southern and northern China to study the field occurrences of tektites and also to search for potential microtektites. Detailed morphological and geochemistry study are performed, and we will report the discoveries at this conference.

Morphological characteristics of tektites: About 500 splash-form tektites that are up to 7 cm in length were found from the Guangdong and Hainan provinces. Some of them that are collected from a narrow layer on the top of a sedimentary gravel layer, and the tektites do not occur in a wide range within or at the top of the gravel layer. These tektites are most likely emplaced *in-situ* and have not been transported after deposition (Figure 1A). Also, abundant of transported tektites have been found, as many of them are exposed at construction sites. In general, all the collected tektites are splash-form tektites. The tektites have various shapes, such as those reported for typical splash-form tektites (e.g., spheres, ovals, boats, dumbbells, teardrops, oblate spheroids, rods, boots and thin plates), and some have very irregular shapes (Figure 1B). Pits, U-shaped grooves, and linear structures are abundant on the surface of the tektites. There are two totally different groups of pits. The depth of one group is deeper (an order of magnitude) than that of the other. Bubbles are common in the tektites, especially on the edges. In some specimens, many bubbles appear as isolated spheres to ellipsoids that have diameters/lengths from ~15 μm to 170 μm. Some elliptical bubbles are flattened and exhibit a spindle shape, and their long axis are parallel to the linear structures on the surface of the tektites. Groups of spherical bubbles are also occasionally observed, and they are organized parallel to the linear structures on the surface of tektites (Figure 1D).

Possible microtektites in Chinese losses: We have visited two losses profiles in the Henan and Shanxi provinces. Microtektite bearing layer have been reported at the boundary of the S7 and L8 layers , which corresponds to a depositional age of ~0.8 Ma [9]. To include all the possible microtektites-bearing materials in the two losses profiles, we have sampled about 800 g losses samples every 5 cm at each of the profiles. Each sample was taken from a 25 cm×10 cm×4 cm block. The samples are now being analyzed to search for potential microtektites. Equal-weight samples are ana-

lyzed to study the spatial density of possible microtektites.

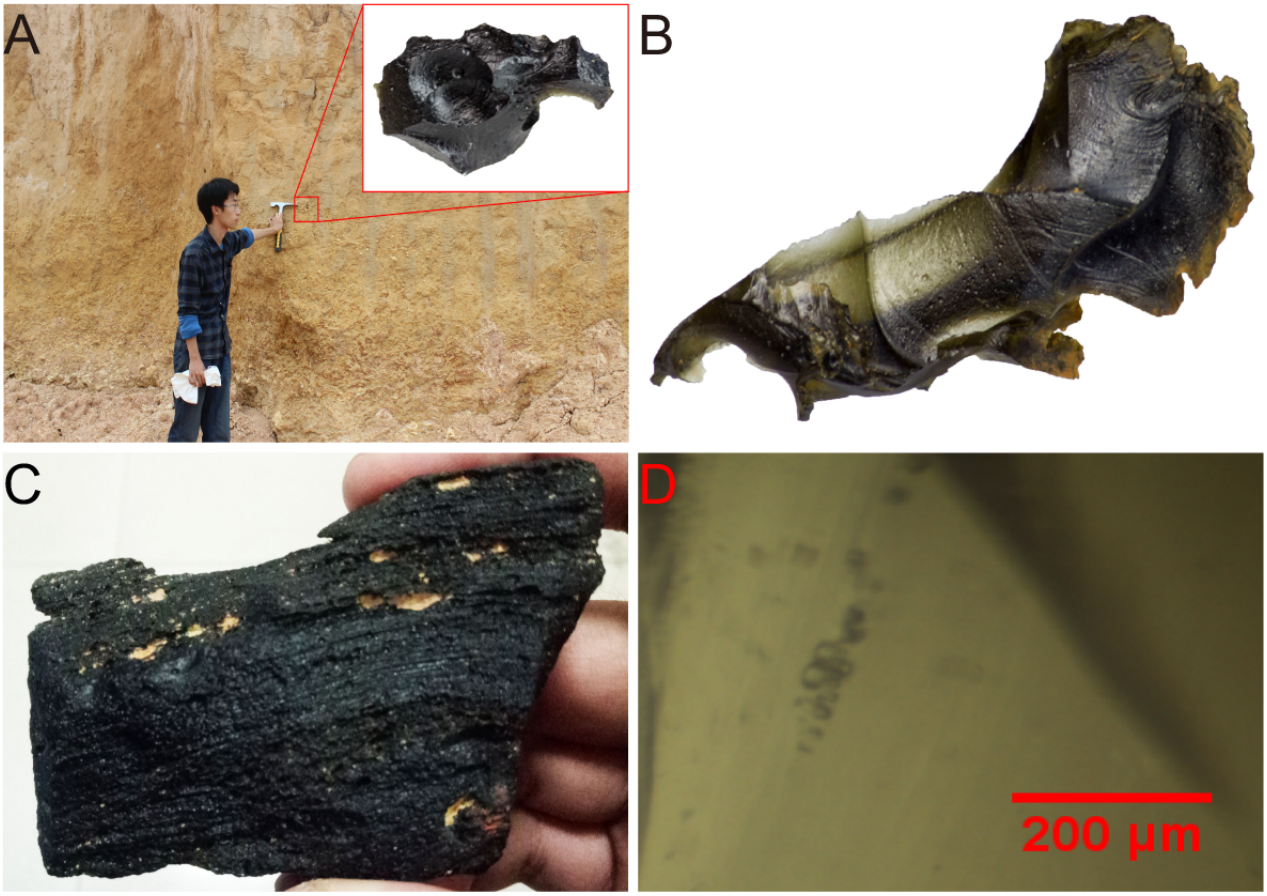

Figure. 1 (A) An *in-situ* tektite on the top of a sedimentary gravel layer. (B) An *in-situ* intact piece of irregularly-shaped tektite. (C) Muong-Nong tektite in China. (D) Group of pointed spherical bubbles along linear structures.

Discussion: We will make acid etching experiments of tektites to distinguish aerodynamic features from erosional features. Chemical experiments for composition are arranged for the discovered Muong-Nong tektites at Zhanjiang, Guangdong (Figure 1C). The interior water contents along vertical profiles will be measured, so that the relative time of degassing and cooling can be compared. The geochemistry characteristics of microtetikes will be analyzed to study their relationship with the Australasian strewn field. These observations and analyses will provide additional insides for the possible source crater of the Australasian strewn field.

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