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Discovery of microdiamonds and disordered graphite by Raman spectroscopy in a mullite-magnetite-silica glass melt rock of impact origin, Gilf Kebir Plateau, SW Egypt

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Libyan Desert Glass (LDG), discovered in 1933, is a pale green rock of almost pure silica glass loosely scattered over approximately 2500 square kilometres near the Egypt-Libyan border. It has been established that LDG originated during the explosion of an extra-terrestrial agent about 29 million years ago. In 2013 it was reported that a black, diamond-rich, rock fragment discovered in the LDG area years earlier, was a piece of comet, the first such cometary fragment to be found and identified. This cometary fragment was named "Hypatia". Separate from this discovery, a mullite-magnetite-glass rock sample was collected from an area close to the LDG strewn field in 2007. This melt rock has a composition and mineralogy unreported thus far for any terrestrial magmatic rock. Phase diagrams of the $\text{SiO}_2\text{-Al}_2\text{O}_3\text{-FeO-Fe}_2\text{O}_3$ system suggests a temperature of $\sim 1600^\circ\text{C}$ is required to produce the observed composition, consistent with an extra-terrestrial origin, but an absence of high pressure phases thus far seems to indicate against an origin by extra-terrestrial impact. In this presentation we show very recent evidence obtained via Raman spectroscopy of cubic diamond and disordered carbon present on a number of small, irregular dark streaks present in a light grey dull matrix of surrounding material. This discovery of ~ 2 micron-sized diamonds present in the mullite-magnetite rock is difficult to explain by a terrestrial process and provides new evidence for the extra-terrestrial origin of the mullite-magnetite rock and its potential association with the LDG and Hypatia.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

Main supervisor (name and email) and his / her institution

N/A

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

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