Diverse and Unusual O-chondrites from the Lut Desert, Iran

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- Two expeditions: February 8 and March 21, 2013
- Four finders: Maziar Nazari, Kiyan Babazadeh, Ashkan Hedayati, Mohsen Adib
- Four finds: three single stones with masses 504.5 g (Lut 003), 504.6 g (Lut 004), 568 g (Lut 002), and 92 fragments totaling 2.1 kg (three of them are Lut 005, Lut 006, and Lut 007)

Left: Mosaics in transmitted light of the thin sections of Lut 005, Lut 006, and Lut 007.

- sharply defined chondrules
- somewhat oblate chondrules
- rough alignment of chondrules
- atypical matrix (olivine+albite)

Transmitted light mosaic of Lut 002 (straight edge is 3.3 cm long). BSE image shows that silicates are equilibrated. Secondary calcium-sulfate (red oval) is a product of terrestrial weathering.

Scans of Lut 003 and Lut 004 thin sections (straight edges are 2.0 and 1.9 cm respectively). **Both are highly unequilibrated.** Lut 004 contains patches of fine-grained matrix typical of a type 3 ordinary chondrite [e.g., 1]. **Lut 003 lacks normal matrix, instead consists of smaller chondrule & mineral fragments.**

Classification of 6 chondrites (representing three meteorites) from Iran
1. Lut 002 H4
2. Lut 003 L3 (fragmental matrix)
3. Lut 004 H3 (relatively low type)
4. Lut 005 L3 (unaltered matrix, olivine+albite)
5. Lut 006 L3 (paired with Lut 005)
6. Lut 007 L3 (paired with Lut 005)

New dense collection area (DCA) in Iran has yielded five official chondrites (Shahdad – H5 [2], Lut 001 – H5 [2], and Lut 002 through Lut 007), suggesting that this area will be highly productive of new meteorites.

Below: Picking up some of the 92 pieces of the 2.1 kg LL3 chondrite (Lut 005, 006, and 007).