AGOUDAL: THE MOST RECENT IRON METEORITE FROM MOROCCO. H. Chennaoui Aoudjehane[1], L.A.J. Garvie[2], C.D.K. Herd[3], G. Chen[3] and M. Aboulahris[1]. [1]Hassan II University Casablanca, Faculty of Sciences Ain Chock, GAIA Laboratory, BP 5366 Maârif 20000 Casablanca, Morocco. E-mail: chennaoui_h@yahoo.fr. [2]Center for Meteorite Studies, Arizona State University, Tempe, Arizona 85287-6004, U.S.A.[3]Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, AB, T6G 2E3, Canada.

Introduction: Agoudal is the most recently approved iron meteorite from Morocco [1]. There are 12 iron meteorites from Morocco and 59 from the NWA region [2] ; only 5 of them have a proper locality name. Following reported information provided by Moroccan dealers on many pieces of an iron meteorite found near Imilchil, we organised a field trip to this area at the beginning of February 2013.

History: In September 2011, a dealer form Errich bought a piece of rock that he recognised as an iron meteorite. It took a few months to determine the origin of this find, which turned out to be near the village of Agoudal near Imilchil (High Atlas mountain, Morocco). Since then, meteorite hunters have been systematically searching with metal detectors. A large number of meteorites, mostly small, have been recovered on the surface or buried a few centimeters. To date,= the largest piece weights near 60 kg, and was found buried about 50 cm below the surface. During our field trip we collected many specimens, providing data on the size of the strewnfield and the direction of the fall.

Residents from Agoudal reported that the first pieces were collected in 2000, then sold to a tourist. This special rock was known by villagers in this area for a long time as a legend: shepherds competed on who is able to lift the "small" but very heavy rock.

Physical properties: Hundreds of small pieces (1-100 g), many 100-1000 g, and a few pieces >1 kg, have been recovered. The majority of the material occurs as 2-5 cm, irregularly shaped shrapnel pieces. Most pieces have a thin weathering rind. Some smaller bullet-shaped (~cm-sized) fragments are rounded, showing well-developed fusion crust. Total mass is >100 kg.

Petrography: Decimeter-sized pieces show a coarse pattern of irregular, interlocking kamacite grains; some grains with sub-boundaries. Widmanstätten pattern is only rarely evident. Grain boundaries commonly curved. Etched pieces range from shiny, with well-developed Neumann bands, to pieces with a matte appearance, typical of the hatched ε-structure. The shock-hatched regions show incipient recrystallization, with secondary growth of irregularly-shaped (to 1 mm) kamacite. No plessite observed. Schreibersite abundant occurring as cm-sized skeletal crystals at the centers of kamacite crystals, as rhabdites, and as a grain boundary precipitate. Rhabdites locally numerous as sharp, 10-25 μm faceted prisms. Scattered troilite nodules, to 1 cm. Troilite not surrounded by schreibersite, but instead large skeletal schreibersite is situated a few mm away. Heat-affected zone visible on some stones. Several of the smaller pieces, and especially the rounded bullet-shaped stones, have fusion crust and heated-affected zone of varying thickness; some completely recrystallized.

Geochemistry: Two samples were analyzed by solution ICP-MS, yielding the following data : Ni 5.5 wt%, Co 4.1 mg/g, Ga 58 μg/g, Ir < 0.04 μg/g and Au ~ 1 μg/g. The geochemical and petrographic data are consistent with a IIAB iron group.

References: [1] L. Garvie et al. 2013, The Meteoritical Bulletin, *Meteoritics & Planetary Science* 47. [2] Meteoritical bulletin database, http://www.lpi.usra.edu/meteor/index.php