A WABAR LIKE SITE IN EASTERN URUGUAY? M. C. L. Rocca, Mendoza 2779-16A, Ciudad de Buenos Aires, Argentina (1428DKU), (maxrocca@hotmail.com).

Introduction: Wabar Impact craters are located in Saudi Arabia (N21°30' E50°28'). They are at least 3 craters of 116, 64 and 11 meters in diameter placed in an area composed of dunes and drifting sand.

The walls of these craters are made of glass impactites which are classified in 3 main types: (1) Large scoriaceous masses (up to 900 g) of silica glass. (2) Medium glass (pumice stone-like) bombs. (3) Small glass beads.

They are found as far as 40 m from their craters [1,2]. So far Wabar is unusual in the world because of its sand fused glass impactites.

A similar site may exist in eastern Uruguay Republic, South America. Located in the Cape of Santa Maria, the town of La Paloma is one of the biggest in SE Uruguay's Atlantic coast (S34°40' W54°10'). The geology of the area is simple: A precambric basement of metasedimentary rocks covered by several meters thick Holocene dunes and drift sand. Today, most of those dunes are fixed as consequence of man made plantation.

By mid-March 1986, after a big sea storm , the South beach on the coast of the Cape Santa Maria was covered with hundreds of pieces of frothy glass rocks which, on hand specimens, resembled very closely Wabar's impactites. There were two types of them: (A) Scoriaceous masses of glass with a rough pitted surface. They were gray-brown in color. Inside they showed a brecciated structure: fragments of a tufa-like white glass sandstone included in a green-brown mass of glass full of bubbles of different sizes. The inner surface of the bubbles had a gleam of a green-brown color. The biggest specimen found was 40 cm wide and about 1 kg. (B) Bomb like pieces: made up inside a very cellular white snow glass, like volcanic pumice stone. On the outside surface of the bombs consisted of a brown-gray glass cover free of bubbles. Inside they were cellular showing hundreds of small bubbles.

The same week a few similar bombs were found by the author on the shore near La Pedrera city, just 10 km North of Cape Santa Maria. Because of their vesicular structures some of those specimens may float on water. Local inhabitants told the author similar scoriaceous rocks were found in the past on the shores...again after big storms, so the event was not unique.

A small bomb sample was studied at the Geological Sciences Department of the Natural History Museum of Buenos Aires city. It consisted of sand fused glass. Unfortunatelly, no specimen was kept.

There have never been any activities connected with glass industry in the area.

It is suggested here that a Wabar-like crater(s) may be hidden offshore in the area of the Cape of Santa Maria, Uruguay. Its glass impactites may have been distributed by the sea currents on the shores after big storms. The event may be frequent. The area demands future attention and study.

References: [1] Krinov E. (1966) *Giant meteorites,* pp. 19–26, Pergamon Press. [2] Wynn J. C. and Shoemaker E. M. (1999) *Scientific American(spanish edition), January,* 14–21.

IMPLICATIONS OF PYRRHOTITE BEING THE MAJOR MAGNETIC CARRIER IN SNCs. P. Rochette[1], J. P. Lorand[2], G. Fillion[3], F. Brunet[4], and V. Sautter[2], [1]CEREGE BP80, 13545 Aix en Provence cdx 4, France (rochette@cerege.fr), [2]Muséum d'Histoire Naturelle, Paris, France, [3]Laboratoire Louis Néel CNRS Grenoble, France, [4]Ecole Normale Supérieure, Paris, France.

A reapraisal of the origin of SNC magnetism is based on new magnetic and mineralogical investigations of the classic falls, as well as of all new shergottite desert finds recognized until 2000 [1]. Previously, SNC magnetism was assigned mainly to titanomagnetite [2]. However it appears that this conclusion holds only for Nakhlites, Chassigny (in fact a practically "non-magnetic" rock), Los Angeles, and possibly the weakly magnetic lerzholitic shergottites. In the most common SNCs, basaltic shergottites (and to a lesser extent ALH 84001), the natural remanence (NRM) appears to be carried by pyrrhotite. Estimates of pyrrhotite amount from hysteresis measurements, modal analysis and sulfur content all point toward 0.2–0.5% of pyrrhotite (Table 1). Pyrrhotite undergoes a ferrimagnetic to paramagnetic transition at a pressure of about 2 Gpa according to previously published Mossbauer study [3]. Thus pyrrhotite should completely loose its magnetic memory when submitted to larger pressure, as confirmed by our preliminary remanence measurement of pyrrhotite crystals nearly isotropically pressed under 3 Gpa at room temperature. This means that the NRM of pyrrhotite bearing SNCs cannot be a primary thermoremanence but is acquired during post impact pressure release.

TABLE 1. Various estimates of weight % of pyrrhotite: A) from saturation magnetization (using 18 Am^2/kg for pure pyrrhotite), B) from modal analysis, C) upper bound from S bulk chemical analysis.

	A	B	C
Shergotty	0.45	0.5	0.36
Zagami	0.12	0.5	0.77
DaG 476	0.33	0.6	0.74
DaG 489	0.32	0.3	-
DaG 670	0.2	-	-
Dho 019	0.35	-	-
SAU 005	0.11	-	0.44
EETA79001	0.22	-	0.48

Furthermore the mineralogical and magnetic features of pyrrhotite in the studied SNC do not fit. Mineralogy points toward large grains of hexagonal (in principle non magnetic) pyrrhotite while magnetic properties (coercivity) indicate nearly single domains (micron scale) in ferrimagnetic state. Intergrowths of monoclinic ferrimagnetic phase are not observed. This contradiction can only be solved by assuming that pyrrhotite in the studied SNCs is in a metastable state due to shock-induced defects and quenching (see [4] for the equivalent in troilite). Indeed, quenched hexagonal pyrrhotite is in a metastable ferrimagnetic state at room temperature. Structural defects within the large pyrrhotite grains can also explain magnetic hardening. Radiation damage produced during Mars to Earth transit may also be invoked for the peculiar magnetic behavior of pyrrhotite in SNC combining very low unblocking temperature and high coercivities (Bcr up to 150 mT) with coarse grain size. The ordered lacunar structure of pyrrhotite may be quite sensitive to this effect, by analogy with ordered FeNi alloys [5]. This may largely invalidate previous paleomagnetic interpretations in pyrrhotite bearing SNCs, including ALH 84001 [6].

Los Angeles appears odd magnetically: It is by far the most strongly magnetic SNC (Ms of 1.2 Am^2/kg), quite heterogeneous, with a low Curie point (130 °C) titanomagnetite. As for shergottites, magnetic grain size of Los Angeles and Nakhla is much smaller than apparent grain size, pointing toward a major imprint of structural defects.

References: [1] Rochette et al., *EPSL,* in press. [2] Kletetschka et al. (2000) *Meteorit. Planet. Sci., 35,* 895–899. [3] Vaughan D. J. and Tossell J. A. (1973) *Science, 179,* 375–377. [4] Joreau P. et al. (1996) *Meteoritics, 31,* 305–312. [5] Néel et al. (1964) *J. Appl. Phys., 35,* 873–876; Butler and Cox (1971) *Science, 172,* 939–941. [6] Kirschvink et al. (1997) *Science, 275,* 1629–1633; Weiss et al. (2000) *Science, 290,* 791–795.

MAGNETIC CLASSIFICATION OF ORDINARY CHONDRITES. P. Rochette[1], L. Sagnotti[1], G. Consolmagno[2], L. Folco[3], A. Maras[4], F. Panzarino[4], L. Pesonen[5], R. Serra[6], and M. Terho[5], [1]INGV Via Vigna Murata 605, 00147 Roma, Italy (rochette@cerege.fr), [2]Specola Vaticana, [3]Antarctic Museum of Siena, Italy, [4]University La Sapienza, Roma, Italy, [5]University of Helsinki, Finland, [6]Museum of San Giovanni in Persiceto, Italy.

Magnetic measurements provide a rapid non-destructive technique to characterize meteorite samples and probe their homogeneity in the 1 to 100 cc volume ranges. Moreover the knowledge of average magnetic properties for a given meteorite class can be used to interpret spacecraft magnetic data, such as provided by the NEAR mission. Magnetic susceptibility (χ) is the most suitable parameter, as it can be measured on various volumes and shapes and it is non-destructive of the paleomagnetic signal (natural remanent magnetization, NRM). Raw NRM intensity is a poor classification parameter