

## W0401

**Combined USANS/SANS Measurements in Archaeometry.** R. Triolo<sup>1</sup>, F. Lo Celso<sup>1</sup>, I. Ruffo<sup>2</sup>, V. Benfante<sup>1</sup>, C. Gorgoni<sup>3</sup> and P. Pallante<sup>3</sup>, <sup>1</sup>Dip. di Chimica Fisica, Univ. di Palermo, Palermo, Italy, <sup>2</sup>Ist. Sup. "Ugo Mursia", Carini Italy, <sup>3</sup>Dip. di Scienza della Terra, Univ. di Modena & Reggio Emilia, Modena Italy.

Marble is one of the most common stones used for objects of archaeological or cultural heritage interest. The identification of ancient marbles, authentication of works of art in museums and the provenance of stone objects is of key importance to archaeology in so far as artistic, technological or commercial exchange patterns may be studied and correlated to historical events and social contacts between cultures. Recently, several geological, physical and chemical methodologies have been applied in archaeometry but, in spite of the interesting results obtained, there are still a number of problems to solve: there is no single method sufficiently reliable for recognising marbles. The most recent approaches involve the use of a hierarchical procedure, with a preliminary petrographic study followed by further characterisation with different techniques. We performed USANS and SANS measurements on a large number of marbles from different Mediterranean locations. The scattering curves have been analyzed by means of a hierarchical model of clusters of fractals formed by primary particles, whose structural parameters (size and nature of the interface) are obtained at large values of the momentum transfer. By properly combining the fit parameters of the model, a master curve can be built. The importance of the structure at meso scale in identifying the provenance of the marble samples is clearly demonstrated.