

MS50-O2 Symmetry, light, materials: the crystallography of cultural heritage

Gilberto Artioli¹

1. Dipartimento di Geoscienze, Università di Padova

email: gilberto.artioli@unipd.it

Crystallography greatly contributes to our understanding and management of cultural heritage. The most immediate connection is the popular relationship between art, architecture, and symmetry: from the graphical perception of symmetry in M.C. Escher's drawings, which most of us borrow during crystallography classes, to the higher-dimensions symmetry found both in quasicrystals and in the intricate decorations developed in the Arabic world. However, being at the forefront of the investigation of matter, crystallography embraces most of the techniques and the methodologies routinely employed for the characterization of materials in archaeometry and art conservation. A number of examples will be discussed showing the application of crystallographic techniques to cultural heritage problems and issues. Specifically, the combination of imaging techniques (2D and 3D mapping, tomography) with diffraction and spectroscopy is developing as a powerful tool for the non-invasive investigation of valuable and unique objects.



Figure 1. Symmetry point groups help decoding the Etruscan numerals: read the story in *Archaeometry* 53, 1031-1043, 2011.

Keywords: cultural heritage, conservation, archaeometry, symmetry

MS50-O3 Frank Allen: creating and using the Cambridge Structural Database System

Colin R. Groom¹

1. Cambridge Crystallographic Data Centre

email: groom@ccdc.cam.ac.uk

For 45 of the 50 years of the Cambridge Structural Database, Frank Allen contributed not only to its development; he also led the way in showing the value of this tremendous community resource.

Frank helped make crystallography unique in science, in that the output of every experiment, in the form of atomic coordinates, is available to everyone. From the inception of the technique, to structures determined this morning – we can all see them. This presentation will review what Frank saw, covering his contribution to the first fifty years of scientific research using the CSD.

Frank took the stories told by each individual structure and turned them into an anthology. This presentation will show how he then helped us to enjoy this *Opera Omnia*.

Keywords: small molecule