SYAM 1: Physics of Ancient Materials

Time: Friday 9:30–12:15 Location: H 0105

Invited Talk SYAM 1.1 Fri 9:30 H 0105
Bringing Dino-Birds to life – Synchrotron X-ray fluorescence and Raman imaging of ancient materials — •Uwe Bergmann — SLAC Stanford, CA, USA

Invited Talk SYAM 1.2 Fri 10:00 H 0105
Linear and Nonlinear Optical Properties of Cultural Heritage Materials — •Marta Castillejo — Instituto de Química Física Rocasolano, CSIC, Serrano 119, 28006 Madrid, Spain

The study of Cultural Heritage substrates and materials represents an interesting challenge due to their complex morphology, structure and composition. The identification of constituents, in often multilayer, multimaterial substrates, the study of the behaviour with ageing and of the response to irradiation by photon or particle beams, used for characterization or conservation purposes, are highly stimulating tasks, as multifaceted interactions among individual components induce important effects on the final encountered physical properties. This talk will focus on the linear and nonlinear optical properties of Cultural Heritage materials and components, on how these can be measured with unprecedented micrometric resolution and on how they provide information on the interactions among constituents. Changes experienced by these properties effected upon laser irradiation used for superficial cleaning or for analytical purposes will be also discussed. Examples on various types of substrates, including stone, paintings, metals and glasses will serve to illustrate the mentioned aspects.

Invited Talk SYAM 1.3 Fri 10:30 H 0105
Morphology and topology of multiscale pore networks: Imaging structural alteration and hydric invasion — •Pierre Levitz — Phenix laboratory, Univ. Pierre et Marie Curie, Paris, France

15 min. break

Invited Talk SYAM 1.4 Fri 11:15 H 0105
Painting cracks: a way to reveal physical properties of matter — •Ludovic Pauchard — FAST, Orsay, France

Craquelures in pictorial layers are the most visible aspect of the "life" of a painting. The large variety of morphologies is caused by the different mechanical behaviours of the layers such as support, ground and paint exhibiting specific physicochemical properties. In general, cracking affects the quality of a paint layer: thus, from a strictly aesthetic point of view, craquelures are undesirable. However the presence of craquelures can be of great interest in judging the authenticity of a painting, for conservation and restoration of paintings, and to characterize the stability of a network of craquelures as a function of the surroundings. Moreover, the morphology of craquelures reveal the mechanical behaviours of the pictorial layer that change due to the ageing of the painting and give information about the methods used by the artist or the conditions of conservation. These processes are highlighted using model nanoparticle gels that provide quantitative information about physical properties of pictorial matter.

Invited Talk SYAM 1.5 Fri 11:45 H 0105
Finite element analysis and biomechanical interpretation of fossil material properties — •Emily Rayfield — Univ. Bristol, UK