

# Preface

Our cultural heritage is the legacy that our society has inherited from the past, and is bestowed for the benefit of future generations. It gives us insight into where we came from and who we are. Its conservation is important not only from the cultural point of view, but also from a practical one. In this context, neutron-based characterization techniques play a fundamental role because neutrons are very penetrating and therefore ideal for the non-invasive investigation of artefacts, allowing both surface and bulk properties to be measured. The full suite of neutron techniques available for cultural heritage research is impressive and many essential results have been obtained using one or more of these tools to provide information that cannot be determined in any other way. Neutron methods allow the characterization of the composition and mechanical properties of ancient materials, helping to answer questions related to the dating, the manufacturing process or the state of degradation of artefacts. The results obtained from neutron investigations are in many cases essential for setting the proper restoration and conservation strategies or for performing the right classification of ancient samples. Nevertheless, the application of neutron beams for cultural heritage purposes is often considered as ‘exotic’ by the researchers and restorers in the field due to the limited availability of neutron sources which are usually large-scale research facilities with restricted access procedures and complex instrumentation.

The intent of this book is to provide an introduction to the wide range of neutron-based characterization techniques, and their impact in cultural heritage research, to the broad community of archaeologists, paleontologists, restorers and curators, historians and holders of private collections as well as material scientists and engineers dealing with the characterization of ancient materials. Answers to many practical questions will be given in conjunction with detailed examples describing some of the more fascinating highlights of applications of neutron techniques in recent investigations, in a form accessible to a large readership. Part I will be dedicated to stories describing discoveries brought about by the use of

neutron techniques in various applications. Part II will cover the experimental techniques in appropriate detail: basic principles, limitations and fields of application. The book encloses visual information in the form of videos related to the contents available in the e-book version of the volume.

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