

## Restoring ancient civilizations through cultural heritage conservation science

Cultural heritage embodies the collective memory and identity of civilizations that have spanned centuries and continents. Understanding and preserving cultural heritage is of utmost importance as it provides invaluable insights into our past and serves as a bridge to the future.

Cultural heritage conservation science employs a multidisciplinary approach that combines scientific research, technological advancements, and conservation ethics. It brings together experts from diverse academic fields such as materials science, chemistry, biology, civil engineering, geological sciences, architecture, archaeology, and history. By harnessing their knowledge and expertise, these professionals strive to restore ancient civilizations concealed within cultural artifacts and tackle the intricate challenges associated with safeguarding our cultural heritage.

Fundamental aspects of cultural heritage conservation science encompass the study of cultural heritage materials, the development of conservation materials, and the implementation of conservation methodologies. The study of cultural heritage materials allows us to comprehend ancient civilizations and provides support for the application of materials and methods in cultural heritage conservation. Conservation materials are designed to aid ancient materials in retaining some of their original properties and mitigate further deterioration. The development and implementation of conservation methodologies aim to ensure the preservation, understanding, and appreciation of cultural heritage for both the present and the future.

We are delighted to present this special topic of *Science China Technological Sciences*, dedicated to the captivating realm of cultural heritage conservation science. The objective of this issue is to shed light on the latest advancements and breakthroughs in this field. The topics covered encompass a broad array of themes, ranging from the development of new materials for conservation purposes to the application of innovative characterization techniques for analyzing cultural heritage materials. Moreover, the issue delves into the development and implementation of novel conservation methodologies, as well as the understanding of degradation phenomena in cultural heritage materials and sites. The materials addressed in this issue include earthen sites, bronzes, ceramic glazes, textiles, lacquerware, as well as the development of consolidants for stones and papers, and cleaning materials for paintings. Such comprehensive coverage reflects the extensive breadth and diversity of research in cultural heritage conservation science. Each contribution offers unique insights into the challenges faced by different cultural contexts, thereby providing a mosaic of knowledge that propels the field of cultural heritage conservation science forward.

We invite you to embark on a captivating journey through the realm of cultural heritage conservation science, as illuminated by the articles in this special issue. Our hope is that this collection inspires scientists, conservation professionals, archaeologists, policymakers, and the wider public to recognize the value and urgency of cultural heritage conservation, as well as the significance of science and technology in restoring ancient civilizations. May this compilation ignite curiosity, spark meaningful conversations, and drive future research endeavors aimed at safeguarding our heritage for generations to come.

We express our heartfelt gratitude to all the authors, reviewers, and editorial staff who have contributed their expertise, time, and unwavering dedication to shaping this special issue. Their collaborative spirit and commitment to excellence have ensured the high caliber of the research presented herein.

LUO HongJie<sup>1,2</sup> & MA Xiao<sup>1,2</sup>

<sup>1</sup> Institute for the Conservation of Cultural Heritage, School of Cultural Heritage and Information Management, Shanghai University, Shanghai 200444, China;

<sup>2</sup> School of Materials Science and Engineering, Shanghai University, Shanghai 200444, China