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## **Focus Point on Past and Present: Recent Advances in the Investigation of Ancient Materials by Means of Scientific Instrumental Techniques**

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This *Focus Point* introduces selected papers from the contributions presented at the 10th Congress of Italian Association of Archaeometry (AIAR) held in Turin (Italy) in February 2018, where a large *parterre* of Italian as well as International researchers shared their experiences on new and more consolidated analytical approaches on archaeological and artistic materials, collectively called “cultural heritage” materials.

The topics covered in this issue, arising from the Congress, were the following:

- 1) characterisation and diagnostics;
- 2) preventive conservation and restoration;
- 3) technological innovation;
- 4) provenance and dating;
- 5) protection and promotion;
- 6) diffusion and scientific divulgation in cultural heritage;
- 7) innovative materials and nanotechnologies;
- 8) bioarchaeology and man-environment interaction.

New frontiers in archaeometry point out at obtaining good quality data on cultural heritage materials by non-invasive and non-destructive analytical techniques that assure a no-sample preparation, large number of quick acquisitions and lower costs of maintenance of the equipment.

To this aim, for example, FT-IR, Raman, FORS and XRF spectroscopic techniques have improved their performances in term of portability, quality of the spectra (*e.g.*, signal/noise ratio) and spatial resolution. However, in order to obtain coherent results on the nature and/or technology of cultural heritage materials, results acquired by these techniques require careful interpretation and, sometimes, spectrum manipulation; in most cases, however, the joint use of different techniques becomes necessary for responding to the proposed goals.

However, the shortcomings encountered by the use of non-invasive/non-destructive techniques cannot be sometimes overcome due to the intrinsic complexity of the materials, such as in the case of ceramics among archaeological objects: in these cases, laboratory facilities can give back more complete information even by the use of a single technique. However, higher costs and time-consuming sample preparation must be taken into account.

Finally, a growing interest, accompanied by increasing technological skills, regards the measurements of environmental conditions both in indoor (museums) and outdoor (archaeological sites) conditions that strongly influence the conservation state of the archaeological and artistic patrimony. Monitoring systems composed by specific sensors that measure a wide spectrum of environmental parameters have been developed, considering several parameters such as the quality of data, the operative life, the real-time operation, the maintenance costs, the sensor size and communication range.

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*Guest Editors*