

# Title: RICH

(Research Infrastructures for Cultural Heritage)

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## SCOPE

RI (Research Infrastructures) are multi-disciplinary institutions by nature, and provide an array of techniques and instrumentation suitable to tackle a variety of problems in condensed-matter research. In most cases, these methods complement more conventional, lab-based techniques, and represent but one, albeit very prominent, weapon among many available to research groups in each field.

CH involvement with RI is relatively recent, if compared to that of other communities in physics, chemistry and biology. Over the years, the latter have undergone a process of reciprocal adaptation with the RIs, whereby the needs of the communities in terms of instrumentation, information and access have been identified and catered for, and new techniques are now gradually been incorporated in the portfolio to meet the evolving research requirements. It is fair to say that a very significant fraction of the research community in the physical and biological sciences is associated with RI, either directly or indirectly through collaborative projects or simply by using RI results in their research. Structural biology is an illuminating example: in the course of two decades, SR research in this field has evolved from a relative narrow discipline to a blossoming mainstream subject, and RIs have evolved a unique response to this need in terms of instrumentation and access, which is distinct from similar provisions for the physical sciences.

In recent years, RIs have seen a significant growth of the demand in the field of CH research, mainly coming from experts in specific RI techniques who have developed interests and connections in CH. This research has at times produced high-profile results, and is always well received by access panels, to the point that management of several RIs is envisaging a broader, mainstream role for their facilities in CH research. However, the number of CH operators that are active at RIs is still small, and probably not fully representative of the broader CH community. This creates an obstacle for RIs to assess their potential “markets” and direct their effort towards the most promising ones, and for the CH community to become collectively aware and focus on the best “products” that RIs can offer.

In assessing the potential of RIs in CH research, one should not be limited to look at individual techniques, as powerful as they are, but must consider the synergies between different RI-based as well as more conventional tools. More and more frequently, large-scale facilities are co-located in clusters within what are becoming true “cities of science” (such as the Polygone Scientifique in Grenoble, France, the RAL site in Chilton, UK and the AREA Science Park in Trieste), increasingly endowed with “research complexes” to support RI research with more conventional

lab techniques. In other cases, RIs have formed regional networks with universities or other research institutions. For example, Trieste has established specific agreements with the Department of Science of Antiquity (University of Trieste) and is signing agreements with the Department of History and Care of Cultural Heritage (University of Udine) and the Regional Sovrintendenza ai Beni Archeologici. These entities are being fully exploited by other communities (once again, the biological sciences are an excellent example), and have the potential to be future “hubs” to coordinate and support a variety of CH research activities.

The purpose of this workshop and foresight study, organized by European scientific institutions with affiliations to advanced lasers, neutrons and synchrotron radiation research centres, is to start bridging the current knowledge gap between RIs and the CH community, by bringing together RI staff (scientists, instrument designers and managers), a representative selection of current RI users in the field of CH and panels of leading CH experts

## MAIN OBJECTIVES

1. To identify a portfolio of RI “analytical” techniques that can be brought further into the mainstream of CH research with minimal technical development. Here, the emphasis is on the effective delivery of consistent, high-quality results in a routine manner. The provision of these techniques, which must be well beyond the demonstration stage, should be geared towards answering the most relevant and appropriate questions in CH research.
2. To identify a series of technical development projects with the potential of delivering new powerful techniques for CH research. Examples are new detection technologies, new imaging techniques, complementary use of different radiations etc. Available funds and effort from RIs and expert facility users should be channelled towards these developments, which will also form the basis for future funding proposal at the national and European level.
3. To identify the most suitable facility access modes for CH research Particular emphasis should be placed on the issue of leveraging between CH research and “traditional” RI subjects, which in the past has been an obstacle for new entries. More specifically, one should ask whether CH access should be coordinated (following the successful model of the engineering community), and, if so, what are the best vehicles to achieve this (CH Facility Access Panels, dedicated CH beamlines, CH Research Network nodes located at the main sites, joint venture companies, etc.). The output are two: :
  - a. organisation models to structure facilities and allocate resources;
  - b. processes and technologies (eg GRID) for remote access.
4. To identify synergies between different techniques, both RI-based and conventional ones. In particular, the potential of multi-disciplinary sites and regional research network including RIs should be fully explored.
5. To identify needs and demand (the “market”) as input from the CHs community in order to plan investments for technologies and operating costs.