# Using OAI-ORE to Capture the Provenance and Results of Materials Science Research

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Many scientific communities, including materials scientists, are under increasing pressure from funding organizations to publish their raw data, in addition to their traditional publications, in open archives. Many scientists would be willing to do this if they had tools that streamlined the process and exposed simple provenance information, i.e., enough to explain the methodology and validate the results without compromising the author's intellectual property or competitive advantage.

This paper will describe the SCOPE (Scientific Compound Object Publishing and Editing) tool, that has been developed through a collaboration between the eResearch Lab and researchers at the Australian Instiute of Bioengineering and Nanotechnology (AIBN) at the University of Queensland, who are investigating novel oxygen-ion-conducting materials for improving the performance of fuel cells. The challenge was to provide a system that enables fuel cell scientists to quickly and easily package up the relevant datasets, images, graphs and papers into a publishable compound object that also contains an explanation of the relationships between the components, the method of derivation, and allows easy fine-grained discovery of components.
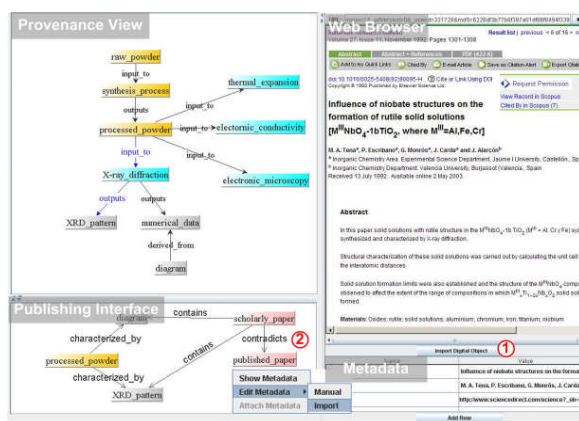
The figure above provides a screen shot of the SCOPE user interface that enables materials scientists to quickly and easily author, edit and publish compound objects based on the OAI-ORE (Open Archives Initiative Object Reuse and Exchange) protocol and RDF named graphs. The GUI supports visualization and exploration of the scientific workflow by allowing permitted users to expand links between nodes to reveal more fine-grained information and nested workflows. But more importantly, the system enables materials scientists to selectively construct "scientific publication packages" by choosing particular nodes from the visual provenance trail and dragging-and-dropping them into an OAI-ORE package which can be uploaded to an archive or repository for publication or e-learning.

http://www.itee.uq.edu.au/~eresearch/papers/2007/IDCC07.pdf