e-Science and Scholarly Communication

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Abstract:
In the future, frontier research in many fields will increasingly require the collaboration of globally distributed groups of researchers needing access to distributed computing, data resources and support for remote access to expensive, multi-national specialized facilities such as telescopes and accelerators or specialist data archives. There is also a general belief that an important road to innovation will be provided by multi-disciplinary and collaborative research – from systems biology and bio-informatics to earth systems science and chemo-informatics. There will also be an explosion in the amount of scientific data collected in the next decade – 100's of Terabytes will be common in many fields. These requirements of scientific research in the future form the 'e-Science' agenda. Robust middleware services will be widely deployed on top of the academic research networks to constitute the necessary 'Cyberinfrastructure' to provide a collaborative research environment for the global academic community. This talk will review the elements of this vision and describe how the scientists and engineers are collaborating with computer scientists and the IT industry to create this Cyberinfrastructure. Such an infrastructure must support the creation of light weight and dynamic 'Virtual Organizations' of researchers for many types of applications in science and engineering. A key part of this Cyberinfrastructure will also be services accessing digital repositories containing both scientific data and full-text publications. Open access in some form or other to these repositories is likely to underpin scientific research in the future and this talk will give some examples of open access repositories and speculate on the future of research libraries.