In praise of openness

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Let me begin by thanking Eva Isaksson. It was she who invited me in May 2009 to come to Pune and talk about open access at LISA VI. For someone who is neither an astronomer nor an astronomy librarian, an invitation to speak at LISA is indeed a great honour.

But then it is with some trepidation I accepted the invitation. Till long after last night's banquet, I was not sure what I could say to such a distinguished group that they might not know already.

I know a number of people associated with LISA for a long time. Apart from most Indian members, I know Jeanette Regan for many years and visited her home and addressed a group of librarians she had assembled in Canberra years ago. She introduced me to Brenda Corbin, who invited me to speak at a session organized by the PAM group in the first ever SLA meeting held outside the United States - at Brighton, UK.

I have great pleasure in dedicating this talk to Dr Eugene Garfield, information scientist extraordinaire, who has played an important role in shaping my evolution as an information scientist. Besides, it is apt to dedicate a talk on open access to a man who made all his writings freely accessible on his web site, long before the open access movement picked up momentum. My own interest in a variety of fields, I am sure, is at least in part comes from my association with this great polymath.

While I was in college, I was introduced to Bertrand Russell by my elder brother and the first thing I read was his BBC Reith lecture of 1927 entitled “Why I am not a Christian?” Needless to say, I owe my iconoclasm to this early introduction to Russell’s cold logic. Subsequently I read Russell’s famous 1932 essay “In praise of idleness,” and I became even more of an iconoclast. The received wisdom was we should all work hard and work long hours and being idle should be despised. Here was a leading intellectual arguing in favour of idleness.

One key argument of Russell was that when technology enabled doing things quickly and without much drudgery we would be foolish not to take advantage of technology – a point I will be using to emphasize the need for the universal adoption of open access. Hence the title, In praise of openness.

I realize talking about open access to a gathering of astronomy librarians is like carrying coal to Newcastle. Astronomers and astrophysicists make their work openly accessible long before they publish their results in refereed journals – something a young and enthusiastic Ratnakar and I learnt in the early 1970s. Ratnakar found an article which he thought would be of direct relevance to his director, Prof. Radhakrishnan. Radhakrishnan told him that ‘astrophysicists get to know the content of most papers that appear in print months before!’

Recently I and my colleague Muthu Madhan looked at the contribution of India to the literature of astronomy and astrophysics. A quick search of *arXiv astro-ph* revealed that worldwide there were 5,638 papers deposited in 1999 and the number more than doubled to 11,287 in 2009. We were not able to count the number of papers deposited from India.

So we made a search of the *Web of Science* and found that Indian researchers had published 326 papers in astronomy and astrophysics in journals indexed in *SCI Expanded* in 1998 and the number rose to 558 in 2007.

In all, India accounted for 4,160 papers in the ten years considered and these had been cited 52,668 times till 3 February 2010, for an average of about 12.5 citations per paper. Overall Indian researchers have published their work in journals of high impact - Over 2260 papers in four journals of impact factor higher than 4.2. I am happy to tell you that IUCAA, our host, accounts for 534 of these papers and these have been cited 10,990 times – an average of over 20 citations per paper.

The only other institution to have published a larger number of papers is TIFR, Mumbai - 751 papers and14,657 citations. Prof. T Padmanabhan of IUCAA has published 20 single-author papers and those have been cited 631 times, for an average of 31.5 citations per paper. He deservedly won the Infosys Prize in the physics category in its inaugural year.

We are not sure, from these data, what percentage of these Indian papers indexed in SCI had appeared in arXive and what role open access play in enhancing the visibility of Indian astronomy and astrophysical research. But we have other evidence to show that open access helps improve both the visibility and citability of published research papers. I quote two cases documented by Alma Swan in her blog Optimal Scholarship.

By open access we mean making available published research papers free to anyone with Internet access. "Self-archiving in the PhilSci Archive has given instant world-wide visibility to my work. As a result, I was invited to submit papers to refereed international conferences/ journals and got them accepted", says a US philosopher. Nearer home, similar experience is reported from the National Institute of Technology, Rourkela, the first Indian institution to mandate open access for all faculty (and student) research publications.

At the 2009 Open Access & Research conference in Brisbane, Paula Callan presented some data from her own QUT repository in a workshop on 'Making OA Happen' (all the ppts are up on the conference website). A chemist, Ray Frost, has personally (yes, please note, all those who say that researchers cannot be asked to deposit their own articles) deposited around 300 of his papers published over the last few years.

This man is prolific in his publishing activity and it is the fact that he has provided such a great baseline that means we can really trust the data here. These have been downloaded 165,000 (yes) times from the QUT repository. From 2000 to 2003, citations were very nearly flat - at about 300 per year, on 35-40 papers per year. When Ray started putting his articles into the QUT repository, the numbers of citations started to take off. The latest count is 1200 in one year.

Now, there's another little piece of information to add to this tale: the QUT library staff routinely add DOIs to each article deposited in the repository. Would-be users who can access the published version will generally do so using those. The 165,000 downloads are from users who do not have access to Ray's articles through their own institution's subscriptions – the whole purpose of Open Access. That's an awful lot of EXTRA readership and a lot of new citations coming in on the back of it.

So far we have been talking about open access IRs. arXiv itself is a central repository. But one can also publish one's papers in OA journals. There are over 4,750 OA journals, including 170 from India, and more than 1,600 repositories. And the numbers are increasing fast.

Indian journals which embraced open access model started recording higher impact factors, e.g IJMR and JPGM. MedKnow, publisher of JPGM, and Bioline International, have plenty of data to show the advantages of going open access.

And yet many researchers are reluctant to embrace OA. They fear that the journal publishers may sue them if they deposit their published papers in IRs. They have concerns about copyright violation. What is needed is OA advocacy.

Organizations such as the Open Society Institute, ARL, SPARC and JISC (UK) and the seven research councils of UK are championing open access. Unfortunately some professional societies, notably ACS, are trying to stall the march of open access. I am reminded of King Canute trying to stop the waves in the sea.

I believe that eventually, in fact pretty soon, open access will be accepted by the vast majority of scientists and institutions. For only with OA scientific literature and data can be fully used. OA, making scientific literature and data free, is the only way to liberate the immense energy of distributed production. The moral, economic and philosophical imperatives for open access are indeed strong.

Even pharmaceutical companies like Glaxo SmithKline have started sharing their hard earned data in the area of drug development for tropical diseases such as malaria.

The openness movement in science scholarship does not end with open access journals and open access repositories – both central and distributed. It includes the open data initiatives, escience and open science.

To learn more about open access please visit the Open Access Tracking Project led by Peter Suber and OASIS <openoasis.org> and join the American Scientist discussion group moderated by Stevan Harnad.

To know more about open science, read the articles by Paul David, the Stanford economist, and Tony Hey of Microsoft.