Open access and impact factors revisited

Do articles made freely available by journals under an open access policy do better than those published under traditional publication routes such as access by subscription? Davis[1] shows that after more than a decade of research, the access–performance question still remains unsettled and that publishers are unable to provide much evidence or insight clarifying the causal nature of the relationship.

CSIR-NISCAIR is an institute mandated to publish 17 primary journals[2]. On the First International Open Access Day on 14 October 2008, CSIR-NISCAIR allowed two of its journals to appear online under open access terms and by mid-2009 all its journals were available on its Online Periodicals Repository in this mode[3]. In the 2012 release of the *Journal Citation Reports* (*JCR*)[4], two CSIR-NISCAIR journals have crossed impact factor (IF) 1, and Mahesh[2] showed that almost all journals have increased their IF in 2011 over the previous years. It now appears that Mahesh[2] concluded prematurely that the increased 2011 IFs were the result of the journals having gone open access from 2008–2009 onwards. The 2014 release of *JCR* has just become available and it is possible to track the performance of the journals over four years since open access was enabled. Most of the journals that increased their IF from 2009 to 2011 have now come down to more modest values. A remarkable departure is that of the *Indian Journal of Fibre & Textile Research*, which was absent from the *JCR* from 2007 to 2011 and has returned with a bang in 2012 – its IF in 2012 and 2013 was 0.486 and 0.778 respectively (Figure 1). Another journal that has been rising steadily has been the *Indian Journal of Engineering Materials Science*. Since 2011, three CSIR-NISCAIR journals have increased their IF, while another ten have shown a decrease in their IF ratings. It is clear that many factors other than open access are at play and indeed as Davis[1] has pointed out, it is impossible to demonstrate that open access leads to a citation advantage.

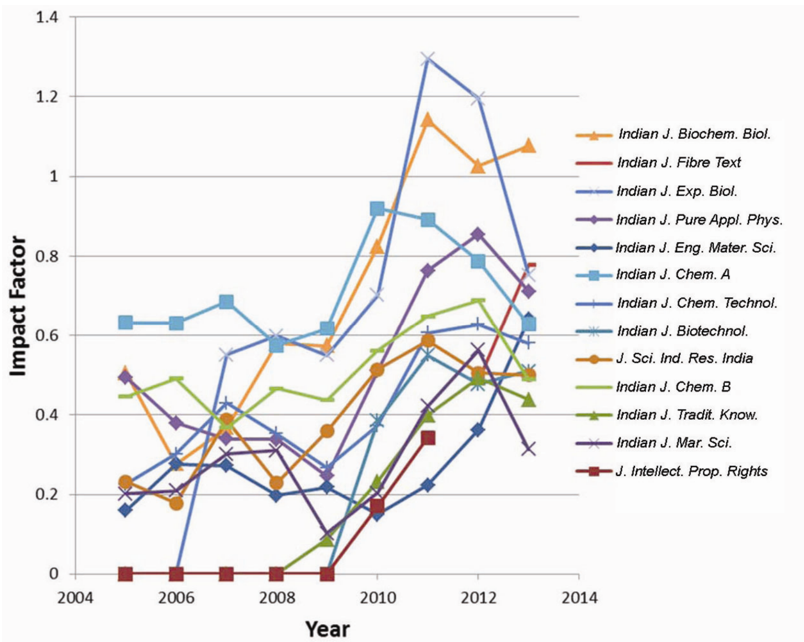

Figure 1. Impact factor trends of CSIR-NISCAIR journals from 2005 to 2013.

1. Davis, P., 2014; http://scholarlykitchen.sspnet.org/2014/08/05/is-open-access-a-cause-or-an-effect/
2. Mahesh, G., *Curr. Sci.*, 2012, **103**, 610.
3. http://nopr.niscair.res.in
4. *Journal Citation Reports*, 2011; http://admin-apps.webofknowledge.com/JCR/JCR

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Monitoring of earthquakes using MEMS sensors

When a strong earthquake occurs, the loss of human lives depends primarily on the intensity of the shaking, vulnerability of the buildings and effectiveness of the rescue operations immediately after the earthquake. In recent decades, the population growth and consequent expansion of urban centres, have led to a significant increase in the exposure of urban areas to the risks induced by earthquakes.

A real-time urban seismic network (USN) could provide immediate post-earthquake information, summarized in maps of ground motion parameters, which might allow to drastically improve the effectiveness of rescue operations. The centres for the post-earthquake emergency management could use these maps to establish the action priorities in order to minimize the loss of human lives, with optimally managing the available resources. However, the high realization costs have made (until now) it impossible to establish a USN.

Recent technological advances in the field of MEMS (micro electro-mechanical systems) sensors can today allow the realization of a low-cost USN, constituted by a high density of measuring points. MEMS devices are a highly enabling technology with a huge commercial potential. In the 90s, MEMS accelerometers revolutionized the automotive airbag system and are today widely used in laptops, games controllers and mobile phones. Also, because of the huge commercial success, research and development of MEMS technology actively continues all over the world.

Due to their versatility, MEMS sensors are increasingly being used in many fields of science, including the physical, engineering and medical sciences. In the last decade, a number of research institutions in the fields of geophysics and seismology started taking interest in this promising technology.

Nowadays, the sensitivity and dynamic range of these sensors are such as to allow the recording of earthquakes of moderate magnitude even at a distance of several tens of kilometres[1,2]. Moreover, because of the low cost and small size, MEMS accelerometers can be easily installed in urban areas in order to establish a USN constituted by densely spaced stations. California has already started the development of seismic networks consisting of MEMS sensors such as the Quake-Catcher Network[3], operated by Stanford University, and the Community Seismic Network[4] operated by the California Institute of Technology. An European urban MEMS-based seismic network for post-earthquake rapid disaster assessment has also been established in Eastern Sicily, Italy[5].

It is becoming obvious that MEMS technology will revolutionize, the way earthquakes will be monitored, which will help develop strategies for earthquake risk reduction.

1. D'Alessandro, A. and D'Anna, G., *Bull. Seismol. Soc. Am.*, 2013, **103**(5), 2906–2913.
2. Evans, R., Allen, R. M., Chung, A. I., Cochran, E. S., Guy, R., Hellweg, M. and Lawrence, J. F., *Seismol. Res. Lett.*, 2014, **85**(1), 147–158.
3. Cochran, E. S., Lawrence, J. F., Christensen, C. and Jakka, R. S., *Seismol. Res. Lett.*, 2009, **80**(1), 26–30.
4. Clayton, R. W. *et al.*, *Ann. Geophys.*, 2011, **54**, 6.
5. D'Alessandro, A., Luzio, D. and D'Anna, G., *Adv. Geosci.*, 2014, **36**, 76–85.

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Further to 'Polysilicon production in India'

I was most interested to read the Historical Note by Gopala Krishna Murthy[1] on Silicon technology in India. This in a way complements my own note[2] on 'Polysilicon production in India' in the same issue. I was however unaware that Metkem continued its activities till 2009. I would like to address a few points raised by Murthy[1] and hence mention some of the work carried out at the Indian Institute of Technology, Kharagpur.

As professor at the Materials Science Centre in IIT Kharagpur from 1977, my first acquisition was a Metals Research Silicon Crystal Growth System capable of also float-zone and Bridgman growth. My group carried out a consultancy project 'Purification and characterization of silicon by float zone technique' for Grindwell & Norton, Bangalore (mentioned in the earlier article[1]) between 1981 and 1982. Later, we also trained some scientists from North Korea, who came under the aegis of ETTDC in Si crystal growth, as this was the only laboratory in the country equipped for the purpose. However, my main interest was the development of low-cost silicon from rice husk[3]. We used alumino-thermic reduction followed by directional solidification to grow a 4 inch diameter multi-crystalline silicon ingot. Since this work has been reported mainly in conference proceedings[4], I hope to write a separate report.

There was no involvement of NML at any stage in our work. We supplied fine silica particles to a tyre company for application as filler in rubber tyres. The industry never got back to us. The highly reactive nature of white ash is suitable for the production of SiC and SiN for which high purity is not a prerequisite. Thus a viable project with low cost by-products was quite feasible. In 1982, the Swiss Government was interested in sizeable funding of our project as it would generate rural employment, but this fell through due to internal politics. The question we always faced from Indian funding agencies was 'Has this been done elsewhere?'

I was an adviser to Super Semiconductors Kolkata (also mentioned in the article[1]) in an informal capacity and visited their plant near Kalyani. The company had a Hamco crystal puller for 6 inch diameter crystals, and very rudimentary cutting and polishing equipment with little technical expertise. Some of the wafers produced were highly compensated and showed no photo-response. The surface finish was also poor as pointed out by CEL. Under Tapan Bhattacharya, CEL developed a complete production line for single-crystal silicon solar cells in the early eighties with completely home-grown technology. Bhattacharya is unfortunately forgotten as the pioneer in Si PV cells and module production in India.

Multicrystalline silicon prepared by directional solidification now supplies the major part of silicon for solar PV cells as it avoids single-crystal growth, produces rectangular ingots and thus avoids cutting losses. Of the companies mentioned[1] as having ventured into polysilicon of late, only Birla Surya (sic!) near Pune made substantial investments in plant and equipment. Some others such as Maharishi Solar, Chennai are growing crystals from imported polysilicon and producing their own modules.

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