

## Editorial

---

I took leave from all through March editorial. I never expected that I would be writing May issue's editorial, as official term of my editorship continues only till 31<sup>st</sup> March (this editorial has been written in February). Since final edited versions of papers need to be published on time to make the contributors happy and as the incoming editor officially takes charge only from 1<sup>st</sup> April, to avoid delay in releasing the May issue I have completed basic structuring of the issue before end of February and continued pre publication procedures. After sending the galley proofs of all the articles for correction by respective authors I proceeded to US on 15<sup>th</sup> March to spend 3 months with my son, daughter and couple of my friends. The responsibility of sending the corrected galley proofs to publisher, after correcting any errors was entrusted to Dr. A.S.S.R.S. Prasad, Org. Secretary of IAGU, who is well versed with such procedures. Due to the concerted efforts of many well wishers of IAGU the May issue was released on time. The next issue in July will be processed and published by the new editor Dr. O.P. Pandey. I wish him success in enhancing the quality of the journal.

For this issue I selected a topic that is relevant to motivate talented female earth scientists.

### **Gender bias in Earth science research**

In one of the most detailed breakdowns yet of gender bias in scholarly publishing, the American Geophysical Union (AGU) in Washington DC has found that its female members submit fewer papers, and are asked to be peer reviewers less frequently, than men. The effect holds across all age ranges, from scientists in their twenties to those in their seventies (*P.S: I have noticed similar effect even in India. Random statistical evaluation of IAGU publications shows prevalence of similar trend*).

The AGU began the study at the request of Marcia McNutt, the former editor-in-chief of *Science* who is now president of the US National Academy of Sciences

in Washington DC. Lerback and Hanson of AGU examined information from 97,431 people, cross-referencing their e-mail addresses with the editorial databases of the 19 AGU journals that existed at the time. About 29% of the society's members are women. Between 2012 and 2015, women who published in AGU journals as first authors had submitted about 1.8 papers each, compared with 2.1 papers for men in the corresponding situation. And women served as peer-reviewers just 18% of the time. The gender differences persisted across age groups, with the greatest discrepancy for the youngest scientists, in their twenties. When asked for the names of possible peer reviewers, female first authors suggested female reviewers 20% of the time, whereas male first authors suggested women 15% of the time. Women also declined invitations to serve as peer reviewers at higher rates than men, completing an average of 3.65 reviews each, compared with 4.34 for men. Scientists who miss out on the chance to participate in peer review are also missing opportunities to develop their reputation and professional skills, says Hanson. "Reviewing is a way to impress people," he notes. Dan Lovegrove, a geology publisher for Amsterdam-based publishing group Elsevier, stated that although 30% of contributions to Elsevier's Earth and planetary science journals come from women, only 13% of its journal editors are female. He says that the company has launched a pilot project to encourage gender equality in recruitment for its editorial boards. (**Source:***Nature* doi:10.1038/nature.2016.20708).

I have selected the topic cited above for this issue's editorial after reading an excellent article by Dr. Kusala Rajendran, a renowned Seismologist working as Professor at IISc, Bengaluru. She has mentioned in an essay recalling the events, influences, and challenges that have shaped her professional life that the India of her childhood did not encourage girls to reach their full potential. She recalls how Indian society of her childhood (and perhaps even now) has remained profoundly patriarchal. With a strong resolve to do well in academics she joined

Roorkee University to pursue her post graduate studies in Geophysics. She recalls that out of nine students admitted that year, she was the only woman in the batch of 1976. There had been no women in the two senior years either. She recalls that she often found herself feeling lonely and isolated as a result, especially during field trips. After completing her education she joined as a junior scientist at CESS (Trivandrum) and got married to C.P. Rajendran. Subsequently she went on a study leave to the US, where she did her PhD under the supervision of Prof. Pradirep Talwani, at the University of South Carolina. After she returned to India 1993, she along with her husband, carried out significant studies in Latur, Kutch, and the Himalaya. Their papers have received considerable attention and are well cited and as a geologist-seismologist duo, they have achieved a degree of recognition. Despite the recognition, she recalls how she often found herself feeling professionally isolated, which motivated her decision to move to IISC where she helped to establish the centre for Earth sciences.

Some points in her recollections are thought provoking and deserves attention and discussion. For example, she notes that limited female representation at top positions in Indian science establishments could well be a factor that inhibits rightful representation and recognition for deserving female candidates. Although she finds the national science academies in India relatively better in this regard, she remains unconvinced that individuals are being judged solely on intellectual merit. She also makes an interesting observation on the conflicts that women of her generation, who are inextricably bound to the cultural and social values face in their professional life. Thus, one has to remain subservient in the family sphere, where as higher-level administrative or leadership positions demand leadership. Many other women in command-driven and male-dominated professions seem to share this view point. A unique challenge she has faced as an earthquake scientist is participating in field work at remote locations, which in her case was made possible through the collaborative research with her husband. Her recollections touch on the experiences of a few female scientists whose

professional ambitions could not be fully achieved due to such constraints. (Source: An Indian Geophysicist Reflects—Kusala Rajendran). *Our grateful thanks are due to Dr. Hortense Marcelin, Managing Editor, Inference: International Review of Science (Quarterly Email Newsletter) Paris, France, for permitting us to publish the bio-sketch of Kusala Rajendran in JIGU.* (For more details visit [www.inference-review.com](http://www.inference-review.com)).

Prof. Kusala Rajendran tells the story of her journey as a Geophysicist that started in the mid-70s. Sure, it was an uncommon choice of study for a girl at that time. Societies and establishments have changed since then. There seems to be some improvement in the recent times as evidenced by equal number of girls compared to boys at the Post graduate level in the Geophysics department of Andhra University, Visakhapatnam and good number of research fellows in the research institutes like CSIR-NGRI. Let us hope for a much improved status for young women researchers. But whether there are equal opportunities for both genders, whether the women can fearlessly move about and do field work in remote areas and whether their families would treat it as normal for a woman professional to be travelling to distant areas are issues that would remain as deterrents at least in the path of some female researchers. For significant improvement in the quality of our research pursuits, it is extremely essential for us to eradicate the gender bias and encourage women scientists to be self sufficient in every respect. Rajendran's story asserts every woman that they are no less in their talents and that they too can do it. Such an assertion is supported by significant works carried out by many female scientists. As I was concluding this subsection of my editorial I came across a write up (Physics Today, 1 January, 2018, PP 46-52) on 1834 mathematician Mary Somerville. She published "On the Connexion of the Physical Sciences", a work that was instrumental in the making of modern physics as a discipline. Apart from receiving rare appreciation from her male contemporaries "Connexion" also posed key questions ....Could women excel at science? Were the scientific writings of a woman inherently different from those of a man? Cambridge

philosopher William Whewell in his review of "Connexion" believed that in the rare circumstance when a woman wrote from deep knowledge, she could do so not with a concern for grubby industrial utility but with lucid metaphysical clarity. Female authorship offered the possibility of direct insight into the laws of nature. Somerville wrote because she believed in the importance of what she had to say and in her significance as a symbol of self education, liberalism, and woman's rights. She realized that the most powerful way of communicating her message was through the story of her own life. Dr. Kusala Rajendran probably believed similarly and brought out her Bio-Sketch. It is clear from the details given above that gender bias existed since time immemorial,

but, a female scientist of either 19<sup>th</sup> century or 21<sup>st</sup> century could excel if there is a profound resolve to excel against many odds. I do hope that our young female earth scientists will follow in the footsteps of Dr. Kusala Rajendran and break all the barriers that inhibit their growth as excellent scientists.

**In this Issue:**

In this issue there are 12 research articles and one Technical note, apart from the editorial.

I profoundly thank the Editorial team and IGU management for achieving a significant level of quality to JIGU.

**P.R.Reddy**