

## Monitoring and promotion of diversity in Asian landscape.

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This article summarises the current situation on diversity, equity and inclusivity in the physics profession in Asia. The status of women in physics in selected Asian countries are presented. The efforts and initiatives undertaken at various levels to reduce the gender gaps are also highlighted.

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## 1. Introduction

Asia has a diverse landscape and contains about 60% of world's population. More than two thousand languages and dialects add to its diversity. The diversity and inclusion activities in Science Technology Engineering and Mathematics (STEM) are focussed on improving the male to female ratio. In this article, we present the status of women in Physics in few Asian countries – China, Japan, South Korea, Iran and India. The choice is guided by the availability of information.

The UNESCO Institute for statistics published the data on women researchers in STEM field in different countries [1]. The global average of fraction of permanent women researchers in STEM according to the study is 28.4%. There are several Asian countries which fare better than the global average and seven Asian countries have fraction of women researchers exceeds more than 50% with Myanmar having the highest fraction of women researchers (84.5%). However, some of the bigger countries, like China, Japan, South Korea, India have fractions of women researchers lower than the global average. In the following section, I will present the gender statistics (mainly in Physics) of some of these countries and the interventions adopted to bridge the gap.

## 2. Statistics and Interventions

Data from China presented in the 6th International Conference on Women in Physics (ICWIP) on the % of women researchers in Physics at undergraduate, Masters, PhD and faculty level over the period 2012-2016 from 13 universities showed that at the PhD level the number is  $\sim 30\%$ , but at the full Professor level this number falls to  $\sim 15\%$ . Working group in women in Physics of Chinese Physical Society was established in 2002 for promoting fairness and harmony. They organise round table meetings for women in Physics during their fall meetings, lecture tours to remote areas to address the regional imbalance. Xie-Xiede prize, named after the celebrated Chinese semiconductor physicist, has also been instituted for women physicists [2].

In Japan the percentage of female researchers has increased from 13.6% to 16.6% during the period 2009-2016. The steps initiated by the two physics societies of Japan – JPS and JSAP, for promoting women's participation, includes – summer schools for junior high and high school girls, daycare facilities and diversity related symposiums at annual meetings of both the Japanese societies, awards for women scientists etc. The Japan Inter-Society Liaison Association Committee for Promoting Equal Participation of Men and Women in Science and Engineering (EPMEWSE) was formed in 2001. At present, this has about 100 academic societies in STEM field in Japan, actively working for gender equity. They conduct Large Scale Surveys on gender equality in STEM every five years and based on the results send suitable recommendations to the Govt. for improving the gender climate and also support STEM programs for high school girls via summer camps and science workshops [4].

Women in Physics Group, under Korean Physical Society, was established in 2002. During 2009-2018, the percentage of its female members have risen from 17.4% to 20.9%. Their activities include – Physics camp for high school girls, special sessions during Annual meetings, Women in Physics workshops. etc. [2].

In Iran the number of female student in physics has shown a steady increase from 0% in 1990 to 50% in 2015 according to the data presented in [2]. However, there is also a sharp decline as

one goes to higher academic positions. For instance the statistics of 2016 shows that the numbers as assistant professor ( $> 20\%$ ), associate professor ( $< 10\%$ ) and full professor ( $< 5\%$ ). Women in Physics group is coordinating the effort to promote networking among women.

Indian data also reflects the same trends as discussed above. The data presented in ICWIP 2021 [5] showed 30% women Physics PhD students which plummets to 14% at the faculty level. Women fellows in Indian Science Academies are less than 10% in number whereas there are 16% women as Directors, council members etc. The reasons include – (i) gender stereotyping (ii) balancing career and family (iii) biases and discriminations. There are initiatives to raise awareness and combat these issues from the science academies, gender groups, independent media etc. Govt. of India had started a women scientist scheme in 2002 which provide fellowships for women with a career break. Some of the notable recent Govt. schemes include – Power Fellowships and Grants for women/ researchers (2020), The GATI (Gender Advancement through Transforming Institutions) accreditation program (2020) — in the line of Athena Swan accreditation scheme in UK. The proposed (2021) Science and Technology Innovation policy (STIP) of Department of Science and Technology emphasizes on mainstreaming equity and inclusion - going beyond gender as binary and addressing broader diversity aspects. Two physics specific working groups in India – (i) The Working Group of Gender equity formed in 2015 under Astronomical Society of India and (ii) Gender in Physics Working Group formed in 2017 under Indian Physics Association are coordinating the activities in improving gender parity in the profession,

There are also pan-Asia efforts. The first international workshop on Asian women in physics held in Korea in 2005 for networking within Asia. Women in Physics Working Group under Association of Asia Pacific Physical Societies (AAPPS) hosts regional meetings and works on strengthening networking. The women in Science and Engineering (WISE) committee under The Association of Academies and Societies of Sciences in Asia (AASSA) is trying to coordinate networking efforts and raising awareness in the Australasia region.

### 3. Conclusion

We have presented the status of women in physics and measures for improving the gender parity in some of the Asian countries. In general, it is observed that the number of women decreases drastically as one goes to higher academic positions. Though the problem is acknowledged, more efforts are needed to identify and rectify the underlying issues that drive these. Countrywide networking can help in learning about each other's best practices and adopting these.

### References

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