

Opening Remarks: XXIX IAU General Assembly FM8

Joseph M. Hilbe

President, International Astrostatistics Association

Chair, ISI Committee on Astrostatistics

3 August, 2015: Honolulu, Hawai'i, USA

On behalf of the International Astrostatistics Association, or IAA, and the International Statistical Institute (ISI), I am pleased to be here for the first overt astrostatistically-related Focus Meeting held in conjunction with an IAU General Assembly. I am also pleased that the Organizing Committee invited both the IAA and ISI to co-sponsor the event.

The IAA is a relatively new professional association devoted to the discipline of astrostatistics, being formed from the ISI Astrostatistics Network in 2012. The ISI is the world statistics association – the statistical sister to the IAU. The Network was formed as an extension of the ISI astrostatistics committee in late 2009 – the first ever standing committee on astrostatistics authorized under the scope of a statistical or astronomical organization. The ISI astrostatistics committee itself evolved from the formation of an ISI astrostatistics interest group in 2008, only a year before. That was the embryo of astrostatistics as a formal component of both the ISI and now IAU.

With the first IAU astrostatistically-related symposium held last year in Lisbon, and with this Focus Meeting on *Statistics and Exoplanets* being held at the IAU General Assembly, and the authorization of a new IAU class B3 commission on Astroinformatics and Astrostatistics commencing at the conclusion of this Assembly, it is clear that statistics and statistical training is now recognized by the general astrophysical community as being important --- and perhaps even vital --- to future astronomical research.

The IAA was formed to combine the interests of astronomers and statisticians into a professional organization in which members of these two disciplines, as well as those in information sciences and other related disciplines, may join their efforts to effect better research. The focus of the IAA from the outset has been collaboration between astronomers and statisticians.

The IAA is currently approaching 600 members from 53 nations, some three-fourths of whom are astronomers. Astrostatistics working groups are now formal components of the IAU, the AAS, and of the American Statistical Association, or ASA. The ISI still maintains a full standing committee on astrostatistics. These organizations are all loosely tied together by their participation in the

Astrostatistics and Astroinformatics Portal, or ASAIP. The Portal was formed in 2012 by astronomer Eric Feigelson and myself, a statistician, and is sponsored by the Pennsylvania State University Department of Astronomy and Astrophysics. ASAIP has folders for each of the above mentioned associated organizations, as well as sections for blogs, announcements, books and journal articles on astrostatistically related topics, and so forth. The Portal has a membership of over 900 researchers having an interest in astrostatistics.

The explosion of interest in astrostatistics is apparent not only in its proliferation of organizations, but also with the many new conferences and workshops that are being conducted in the area. Most involve the input of both astronomers and statisticians. Prior to 2009 only a few conferences existed in the area. The most noted was – and still is – the *Statistical Challenges in Modern Astronomy* series, which has been held on a quint-annual basis from 1991. Several other small conferences were held on a periodic basis both in the US and Europe, and a couple of small collaborations existed, primarily with members coming from two or three universities. Now, just six years later, there are numerous conferences and workshops, some of which are already producing quality published research.

In 2014 the IAA sponsored the creation of a new section called the Cosmostatistics Initiative, or COIN, originated by Rafael de Souza of *Eotvos Lorand University*, in Budapest. COIN sponsored a residence program where astronomers and statisticians worked together for a week in Lisbon. They divided into working groups, each focusing on the development of a research project. Five published papers resulted from that residence workshop, and three software packages, one of which was published on CRAN.

The goal of these packages is to provide astrostatisticians with state of the art modeling and diagnostic tools to better understand their data. In some cases this entails the use of statistical methods that have not previously been used by astronomers to analyze astronomical data. All this came from COIN-1.

A second COIN residence program is being held this year in late October on the Isle of Wight, just off the British coast in the English Channel. Both seasoned and PostDoc astronomers and leading statisticians will convene together, working against the clock on challenging astrostatistical problems. If the second edition is like the first, collaborators will seek to find new and interesting statistical methods to use for better understanding astronomical data.

COIN is a paradigm for other IAA sections which are beginning to develop. Other types of collaborations are also being considered. This is a new and exciting time for astrostatistics and for new astrostatistical organizations.

I should also like to mention that the Statistical and Applied Mathematical Sciences Institute, or SAMSI, with headquarters in Research Triangle, North Carolina, recently approved a year-long Astrostatistics research program for 2016-17. The Opening Workshop for the program is to be held next year from August 29th to September 2nd. Headed by Jogesh Babu, the project will consist of astronomers and statisticians spending time together at SAMSI headquarters working together on specified research projects. This is the first time astrostatistics has been considered as the subject for a year-long SAMSI research program.

I mentioned earlier that the first ever IAU astrostatistics symposium was held last year in Lisbon, titled *IAUS306 - Statistical Challenges in 21st Century Cosmology*. A follow-up to this symposium will be held next May on the island of Crete. It is not an IAU symposium, but is being sponsored by the IAA and several other organizations. I expect that the conference will be every bit as successful as the first.

The IAU did, however, accept a new related Symposium for 2016: *IAUS245 - Astroinformatics*. It will be held from September 29th to October 4th in Naples, Italy on the Isle of Capri. The symposium is being held under the scope of the new IAU commission on astroinformatics and astrostatistics. It is the first such symposium on astroinformatics.

My point here is that there are a growing number of astrostatistically related conferences and workshops being held throughout the world, and that we are now beginning to employ sophisticated statistical methods to astronomical data. There is so much more to come. I believe that as statistical methods are improved and as we learn how to more optimally apply them to data, we will learn much more about the universe than we can know without using them --- hence the importance of this Focus Meeting and of astrostatistics as a discipline.

On behalf of the IAA, and of the ISI standing committee on astrostatistics, we welcome the new IAU class B3 commission on Astroinformatics and Astrostatistics, and of course this Focus Meeting. It could not have been accomplished without the tireless efforts of Eric Feigelson, President of the forthcoming Commission. Thank you, Eric. Finally, I look forward to a long, close, and productive relationship between the IAA and this new IAU commission.