

COMMISSION B3

Astroinformatics and Astrostatistics

ASTROINFORMATIQUES ET ASTROSTATISTIQUES

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TRIENNIAL REPORT 2018-2021

1. Background

Commission B3, on Astroinformatics and Astrostatistics has been building bridges with other similar groups that are part of organizations like the American Astronomical Society (AAS), the American Statistical Association (ASA), the International Astrostatistics Association (IAA), International Astroinformatics Association (IAIA), the International Virtual Observatory Alliance (IVOA), and many other national organizations so that collective progress can be made that does not reinvent wheels. As one part of the above, for instance, we will be co-sponsoring, with IAA, talks by winners of the IAA prizes. The B3 members are helping move the defunct ASAIP portal to GitHub pages with the help of Astrostatistics Interest Group (AIG).

The commission continues to engage with major survey collaborations like ZTF, Gaia, SKA, LSST/Rubin so that big data and big sample problems can be attacked. The commission will be working closely with the alert brokers that are being developed in the US, Chile, England, France etc. and is becoming more relevant due to the growing data rates and associated issues.

2. Developments within the past triennium

2.1. *Growth of the field*

Astroinformatics Commission under Chinese Astronomical Society was established on June 14, 2019.

A new journal of astrostatistics has been created as a section of Frontiers in Astronomy and Space Sciences as of March 2020[†] and lead by one of the members of the organizing committee of the commission.

2.2. *Meetings organized*

The conference on China-VO and Astroinformatics organized by China-VO team is held each year. The 2018-2020 dates were as follows: 2018, Nov. 21- 25, 2018, Jingdezhen, Jiangxi; 2019, Nov. 27- Dec. 01, 2019, Daqing, Heilongjiang; 2020, Nov. 25- 29, 2020, Xiamen, Fujian

The legacy of IAU Symposium 306 ‘Statistical Challenges in 21st Century Cosmology’

[†] <https://www.frontiersin.org/journals/astronomy-and-space-sciences/sections/astrostatistics>

(Lisbon 2014) continued with follow-up meetings in 2016 (Chania, Greece) and 2018 (Valencia, Spain).

IAU B3-sponsored application for a 2019 symposium on ‘Bayesian Inference in Astronomy’ in London was not successful.

Our members have contributed to many summer schools, and, during the times of pandemic, to various online events. Members continued to be active in various larger meetings.

2.3. *Cross-disciplinary Landscape*

The Astrostatistics Interest Group[†] of the International Statistical Institute (ISI) has been reactivated in 2017 and is expected to interact closely with similar astrostatistics groups in sister organizations such as the IAU.

3. Future Plans

The symposium ‘Machine Learning in Astronomy: Possibilities and Pitfalls’ was accepted to be held at the 2021 IAU GA, and along with other meetings has been postponed to 2022. It should be timely as the uptake of ML has been phenomenal. Informatics has also been growing in other sciences and we plan to explore methodology transfer with different groups, in particular in Earth Sciences, and Medical Sciences. We also plan to build towards informatics and statistics for space data, not just data downloaded to earth, but also data that could be processed onboard spacecrafts as computing keeps getting closer to data origins.

The commission would also like to see further IAU symposia in the astrostatistics area, such as a resubmission of the ‘Bayesian Inference in Astronomy’ proposal, or a follow-up of the Lisbon IAU symposium 306.

The commission will be sponsoring a seminar series, joint with IAA.

The growth in adoption of techniques for astroinformatics and astrostatistics, coupled with the accessibility of implementations and examples through code-sharing platforms such as GitHub, means that more institutions and organisations are developing up-to-date hands-on and virtual training materials. An example here is the suite of training presented through the bi-annual Australian National Institute for Theoretical Astrophysics[‡] (ANITA) astroinformatics workshops, which are delivered in partnership with the Astronomy Data & Computing Services[¶] (ADACS) team. The Commission can contribute to the growth of skills in the field by ensuring that awareness of such training materials is shared amongst members.

Ashish Mahabal
Vice-President of the Commission

[†] <https://www.isi-web.org/community/committees/special-interest-groups?id=128>

[‡] <https://anita.edu.au>

[¶] <https://adacs.org.au>