

ISI ASTROSTATISTICS COMMITTEE AND ISI ASTROSTATISTICS NETWORK

GOALS

The foremost goal of the ISI astrostatistics committee is to foster collaboration between members of the statistical and astronomical communities. It also seeks to support existing astrostatistical organizations and endeavors, and will serve as a locus for the dissemination of information regarding astrostatistical education programs, conferences, web sites, and related publications. The committee hopes to serve as an apolitical representative of the astrostatistical community, and will manage the creation and maintenance of a global network of astrostatisticians, consisting of astrophysicists, statisticians, and anyone else having an interest in the statistical analysis of astronomical data.

Members of the executive committee, or committee, are charged with establishing relationships between the committee/network and other organizations which have activities related to astrostatistical analysis. For example, we intend to maintain a working relationship with the American Statistical Association, Royal Statistical Society, NASA, Jet Propulsion Laboratory, and European Space Agency, as well as with existing astrostatistical centers and associations, e.g. the Pennsylvania State Center for Astrostatistics, the California-Harvard Astrostatistics Collaboration (CHASC), the International Computational AstroStatistics Group (InCA), and similar associations.

The committee also intends to sponsor a Journal of Astrostatistics, to be published by Wiley, when it is assured that there will be a steady stream of quality submitted manuscripts. The Journal will be discussed at the next general meeting of the committee and network, which will be held in conjunction with the 2011 ISI World Statistics Congress in Dublin, Ireland.

ISI ASTROSTATISTICS NETWORK

The ISI Astrostatistics Network is an essential component of the committee goals. Membership is open to anyone with an interest in the statistical analysis of astronomical data. Members of the Network are able to contribute advice as well as their special expertise to the furtherance of committee goals and objectives, and may, upon approval of the committee, engage in tasks representing the committee and the Network association in general.

A Network membership list will be maintained by the committee. Each member is expected to provide their name, affiliation, email address, and primary areas of astrostatistical interest. A listing of Network members as of 19 February, 2010 is found near the end of this site. The Network registry with full information about each member is posted separately.

The ISI astrostatistics committee is the executive committee of the Network, which we regard as a global association of researchers with an interest in the statistical analysis of astronomical data. Aside from working toward collaboration between statisticians and astronomers -- or perhaps in furtherance of that goal -- the Network will seek to advance astrostatistical expertise through

fostering, and perhaps conducting, astrostatistical educational programs directed to both statisticians and to astronomers. We hope to develop or support outside continuing education programs for astronomers desiring to learn advanced statistical methodologies so that they can themselves either engage in the analysis of their project data, or work in concert with a statistician or team of statisticians trained in astrostatistics. Likewise we wish to provide, or support, astrostatistical education programs directed to statisticians who wish to engage in astronomical research. And, as previously indicated, we envision the Network as being the base from which quality astrostatistical research will be generated. Providing opportunities for the dissemination of astrostatistical research findings through conferences, colloquia, and the sponsoring of a journal are all important functions of our Network.

Joseph M. Hilbe
Chair, ISI Astrostatistics
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6 January, 2010 : Rev 19Feb 2010

INAGURAL COMMITTEE MEMBERS

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| Joseph M. Hilbe | hilbe@asu.edu ; jhilbe@aol.com Solar System Ambassador, NASA/Jet Propulsion Laboratory; Adj Prof of Statistics, Arizona State U; Emeritus Prof, Univ of Hawaii |

ASTROSTATISTICS WEB SITES

Pennsylvania State University Center for Astrostatistics

<http://www.astrostatistics.psu.edu/>

Overview of Penn State Astrostatistics program:

<http://www.astro.psu.edu/users/edf/research/stat.html>

California-Harvard-ASC Astrostatistics Collaboration (CHASC)

<http://hea-www.harvard.edu/AstroStat/>

www.ics.uci.edu/~dvd/astrostat.html

International Computational Astrostatistics (InCA)

<http://www.incagroup.org/>

Pittsburgh Computational AstroStatistics (PiCA) group.

<http://www.picagroup.org>

Cosmostat conferences

<http://www.itp.uzh.ch/cosmostats/>

<http://www.practicalastroinformatics.org/conferences>

<http://www.astroinformatics.eu/>

<http://inference.astro.cornell.edu/library.html>

<http://timemachine.iic.harvard.edu/>

<http://astro.u-strasbg.fr/~fmurtagh/mda-sw/>

FORTHCOMING CONFERENCES (to be updated regularly)

Astronomical Data Analysis conference, 3-6 May 2010, Tunisia:

<http://www.aset.org.tn/conf/ADA6/index.php>

ASTRONOMICAL DATABASES (to be updated)

Penn State Astrostatistics datasets: <http://www.astrostatistics.psu.edu/datasets/index.html>

Astrostatistics and Databases (10): <http://adass.org/adass/proceedings/adass98/Astrostatistics.html>

AstroStat Slog: <http://groundtruth.info/AstroStat/slog/2009/mads-kriging/#more-3435>

Mauritius Radio Telescope Project: <http://www.uom.ac.mu/mrt/mrt2.html>

Deep Sky Database (amateur): <http://www.virtualcolony.com/sac/>

NASA/IPAC Intergalactic Database: <http://nedwww.ipac.caltech.edu/>

AstroWeb : <http://www.cv.nrao.edu/fits/www/astronomy.html>

Astronomy Sky Object Database: <http://www.astronomyforum.net/astronomy-forum-announcements/5865-astronomy-sky-object-database.html>

HYG database: <http://www.astronexus.com/node/34>

The Messier Database: <http://seds.org/Messier/>

SAO/NASA Astrophysics Data System: <http://adswww.harvard.edu/>

UMRAO Database Interface: <http://www.astro.lsa.umich.edu/obs/radiotel/umrao.php>

XTE FITS Database: http://iraf.noao.edu/iraf/ftp/ftp/conf/web/adass_proc/adass_95/rotsa/rotsa.html

SIMBAD Astronomical Database: <http://simbad.u-strasbg.fr/simbad/>

ESA INES Archive Data Server: <http://godot.u-strasbg.fr/ines/>

StrBase CiteSeerX Database: <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.55.1418>

Sloan Digital Sky Survey data – SKYSERVER project: <http://cas.sdss.org/dr5/en/>

Sloan Digital Sky Survey data – public access: <http://portal.acm.org/citation.cfm?id=564758>

Spitzer Space Telescope data (JPL): <http://www.spitzer.caltech.edu/>

The Space Telescope Science Institute (JPL) : <http://www.stsci.edu/resources/>

SDSS: <http://research.microsoft.com/en-us/um/people/gray/SDSS/>

[data are being involved in this project: The Hubble Space Telescope [HST]
 Chandra X-Ray Observatory [Chandra]; Sloan Digital Sky Survey [SDSS]
 Two Micron All Sky Survey [2MASS]; Digitized Palomar All Sky Survey [DPOSS]

ISI ASTROSTATISTICS NETWORK (as of 19 Feb 2010)

Details regarding each member, including affiliations, additional contact information, and research interests are found on a separate ISI Astrostatistics Network Registry listing. The Registry and list below are divided into two sections: Astrophysics and Statistics.

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PUBLICATIONS (to be updated)

Babu, G.J and E.D. Feigelson (1996), *Astrostatistics*, Chapman & Hall

Cressie, N (1993), *Statistics for spatial data*, Wiley

Feigelson, E.D and G.J Babu (2003), *Statistical Challenges in Astronomy*, Springer

Illian et al (2008) *Statistical Analysis and Modelling of Spatial Point Patterns*, Wiley

Lindquist, M.A. The Statistical Analysis of fMRI Data, *Statistical Science*, Vol. 23(4), pp. 439-464

Loredo, T.J., J. Rice and M.L. Stein, Introduction to Papers on Astrostatistics
The Annals of Applied Statistics, 2009, Vol. 3, No. 1, 1–5

Martinez, V.J. and E. Saar (2002), *Statistics of the Galaxy Distribution*, Chapman & Hall/CRC

Saslaw, W.C, (2000), *The Distribution of the Galaxies: Gravitational Clustering in Cosmology*.
Cambridge University Press

J.-L. Starck, J.L. and F. Murtagh (2006), *Astronomical Image and Data Analysis*, Springer

Van Dyk, D, S. Degennaro, N. Stein, WH Jeffreys, and TV Hippel, (2009) Statistical Analysis of Stellar Evolution, *The Annals of Applied Statistics*, Vol. 3, No. 1, 117-143

Wall, J.V, and C. R Jenkins, *Practical Statistics for Astronomers*, Cambridge University Press

RECOMMENDED STATISTICS TEXTS, USEFUL FOR ASTROSTATISTICAL ANALYSIS

This is a preliminary list of recommended statistics texts, per area of statistics. It is a start. I invite you to send me your recommendations, with title and author(s). R appears to be the *lingua franca* of astrostatistics. There are exceptions, however, but I have posted books related to R that can be helpful to those engaged in astrostatistical research. A few books listed do not use R for examples; most do.

DATA MINING

Nisbet, R., J. Elder and G Miner (2009). *Handbook of Statistical Analysis and Data Mining Applications*, Academic Press

Hastie, T. and R. Tibsharini (2009). *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, Second Edition, Springer

Tan, P, M. Steinbach, and V. Kumar (2005), *Introduction to Data Mining*, Addison Wesley

PATTERN RECOGNITION

Bishop, C (2007). *Pattern Recognition and Machine Learning*, second edition, Springer

LOGISTIC REGRESSION

Hilbe, Joseph M (2009), *Logistic Regression Models*, Chapman & Hall/CRC

Hosmer, D.W. and S. Lemeshow (2000), *Applied Logistic Regression*, Wiley

COUNT MODELS

Hilbe, Joseph M (2007), *Negative Binomial Regression*, Cambridge University Press

Cameron, A.C and P.K. Trivedi (1998), *Regression analysis of count data*, Cambridge University Press

MULTILEVEL REGRESSION ANALYSIS

Gelman A and J Hill (2007), *Data analysis using regression and multilevel/hierarchical models*, Cambridge University Press

NONPARAMETRIC

Sprent, P and N. C Smeeton (2007). *Applied Nonparametric Statistical Methods*, Fourth Edition, Chapman & Hall/CRC.

Tsybakov, A.B (2009), *Introduction to nonparametric estimation*, Springer.

BAYESIAN METHODS

Albert, J. (2009), *Bayesian Computation with R*, Springer

Gelman, A, J. Carlin, H. Stern, and DA Rubin (2004), *Bayesian Data Analysis*, 2nd edition, Chapman & Hall/CRC

Hjort, N.L., (2010), *Bayesian nonparametrics*, Cambridge University Press

King, R., B.J.T Morgan, O. Gimenez, and S. P Brooks (2010), *Bayesian analysis for population ecology*, Chapman & Hall/CRC

BOOKS ON R DATA ANALYSIS AND PROGRAMMING

Maindonald, J. and J. Braum (2007). *Data analysis and graphics using R*, 2nd edition, Cambridge University Press

Jones, O, R. Maillardet, and A. Robinson (2009), *Scientific programming and simulation using R*, Chapman & Hall/CRC

GENERAL STATISTICS

Dohoo, I, W Martin, and H. Stryhn (2010), *Veterinary Epidemiologic Research*, 2nd edition, Ver Press [880 page comprehensive text dealing with most all areas of statistics. Veterinary examples, but the methods discussed can be used for most areas of research. Excellent introductory chapters on Bayesian analysis, analysis of spatial data, and analysis of clustered data.] Order, view, data: www.upei.ca/ver

STATISTICAL/MATHEMATICAL PROGRAMS – FOR ASTROSTATISTICAL RESEARCH

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| Mathematica 7 | www.wolfram.com |
| Mathstata 2 | www.mathstata.com |
| Matlab | www.mathworks.com |
| R | www.r-project.org |
| Stata | www.stata.com |
| SAS | www.sas.com |
| Statistica Data Miner | www.statsoft.com/products/data-mining-solutions/ |
| winBUGS | www.mrc-bsu.cam.ac.uk/bugs/winbugs |