## Highlights

## Algebraic Statistics: A New Bridge Between Statistics and Mathematics

Applications of algebra in statistics have a long history. However, the classical applications mainly involve linear algebra techniques such as those already used in multivariate statistics. It is only during the past decade that computational methods from algebraic geometry and commutative algebra have found their way into statistics. This development originated with work on Markov chain Monte Carlo algorithms for exact inference in contingency table analysis, which represents the best explored statistical application of computational algebra. However, many other fields of application have emerged and a community of researchers with algebraic interests has begun to form under the umbrella of "algebraic statistics".

Through a series of eight articles, this special issue highlights the diversity of this young and developing field of algebraic statistics. The articles are preceded by an editorial note by Steve Fienberg who shares his views of the field. The plan for this special issue originated at the 2005 Workshop on Algebraic Statistics and Computational Biology, which was held at the Clay Mathematics Institute (For details of the workshop, please visit the website at http://www.claymath.org/programs/cmiworkshops/ascb/). While three of the articles discuss applications in computational biology, the general scope of this special issue is broader than that of the Clay Workshop. The represented statistical topics are indeed diverse and include contingency table analysis, experimental design, foundations of algebraic statistics, graphical models, and maximum likelihood estimation.

We hope that this special issue will stimulate interest in algebraic statistics among statisticians, which brings with it exciting new opportunities for interdisciplinary collaborations between mathematicians and statisticians.

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founding co-editor of Chance and served as the Coordinating and Applications Editor of the Journal of the American Statistical Association. He is currently one of the founding editors of the Annals of Applied Statistics and is co-founder of the new online Journal of Privacy and Confidentiality, based in CyLab. He has been Vice President of the American Statistical Association and President of the Institute of Mathematical Statistics and the International Society for Bayesian Analysis. His research includes the development of statistical methods, especially tools for categorical data analysis. His work on confidentiality and disclosure limitation addresses issues related to respondent privacy in both surveys and censuses and especially to categorical data analysis. Fienberg is the author or editor of over 20 books and 300 papers and related publications. His two books on categorical data analysis are Citation Classics. He is a member of the U. S. National Academy of Sciences, and a fellow of the Royal Society of Canada, the American Academy of Arts and Sciences, and the American Academy of Political and Social Science.