Statistics in Mathematical Sciences at Southampton

Statistics in Mathematical Sciences is an outward looking and vibrant group. As part of the Southampton Statistical Sciences Research Institute (S3RI), we are members of a community of more than 40 statisticians from the mathematical, social, medical and health sciences. We teach undergraduate and postgraduate modules across the full range of the statistical sciences, contributing to a variety of programmes in Mathematics including MMath with Statistics, BSc Mathematics with Statistics, MMORSE and BSc MORSE, and Mathematics with Actuarial Science. We run popular MSc programmes in Statistics and Statistics with Applications in Medicine. We are founder members of the Academy for PhD Training in Statistics (APTS), and we have taught the Statistical Modelling and Design of Experiments APTS modules since their inceptions.

Our main research areas are the **Design and Analysis of Experiments**, **Statistical Modelling and Computation**, and **Biostatistics**.

We are home to one of the leading groups in the world for the **Design and Analysis of Experiments,** led by Professor Dave Woods. Motivated by substantive applications from science, technology and industry, this group's main research topics include optimal design for nonlinear models, computational methods for Bayesian design of experiments, design for uncertainty quantification for complex mathematical and computational models, and screening experiments with large numbers of controllable variables. We are currently involved in active EPSRC multidisciplinary projects totalling more than £13 million, and we have strategic external relationships with the pharmaceutical industry and government.

Research in **Statistical Modelling and Computation**, led by Professor Sujit Sahu, focusses on methodological developments to address problems from environmental science, demography, finance and econometrics, and public health. Major areas of interest include spatio-temporal modelling for a number of application areas including disease mapping (e.g. for pandemic data), environment (e.g. air pollution data) and oceanography, inference for latent variable and mixed models, inference using approximated likelihoods and composite likelihoods, stochastic modelling of mortality and morbidity rates, nonlinear time series, and simultaneous inference, multiple testing and sequential methods. External partners include environmental agencies in the UK and USA, the Met Office, the Office for National Statistics, and public health bodies in England and Wales.

The **Biostatistics** group is led by Professor Dankmar Böhning, who is also strongly involved in S3RI, and undertakes research into the development and application of statistical methods in medicine including public health, clinical trials and epidemiology. We enjoy strong links with Medicine and Life Sciences at the University of Southampton. Research areas include survival analysis, simultaneous inference, statistical phylogenetics, causal inference, statistics for doping detection, capture-recapture modelling, and methods for research synthesis and meta-analysis. We also work with external partners including the World Anti-Doping Agency, the Animal Health and Veterinary Laboratories Agency, the Department of Environmental, Food and Rural Affairs, the World Health Organisation, and NHS Blood and Transplant.