



SAMSI Plans

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2005-2006 Programs

Financial Mathematics, Statistics and Econometrics (Fall 2005)

- Focus on bringing together Applied Mathematics, Economics/Finance, and Statistics/Econometrics – to address the three essential tasks in domains ranging from financial and energy derivatives to real options
 - Modeling
 - Handling data
 - Computing
- *Program leaders:* Marco Avellaneda, Jean-Pierre Fouque (Chair), Eric Ghysels, Ronnie Sircar, Ruey Tsay, Thaleia Zariphopoulou; H. T. Banks (directorate liaison), John Lehozcky (NAC liaison)

National Defense and Homeland Security (full year)

- Possible emphases
 - Biointelligence
 - Anomaly detection
 - Data integration
 - Real time inference (data streams)
 - Dynamics of massive databases
- *Program leaders:* James Crowley, Lawrence Cox (co-chair), Jon Kettenring, Nell Sedransk (co-chair); Alan Karr (directorates liaison), Sallie Keller-McNulty (NAC liaison)

Astrostatistics (Spring 2006)

- Potential emphases
 - Modeling highly preprocessed data
 - Handling selection bias
 - Signal identification in massive data sets
 - Mixture model analysis
 - Imaging
 - Spatial processes
 - Time series analysis of periodic phenomena
- *Program leaders:* Jogesh Babu (Chair), Eric Feigelson, Donald Richards, Alanna Connors, and Larry Wasserman; James Berger (directorates liaison), Peter Bickel (NAC liaison)

2006-2007 Planned Programs

High Dimensional Inference and Random Matrices (Fall 2006)

- Potential emphases
 - Extreme sample eigenvalues
 - Properties of sample eigenvectors
 - Empirical distribution of eigenvalues
 - Design of snapshots for computer model approximation
 - Nonlinear/topological approaches to dimensional reduction
 - Bayesian utilizations of random matrices
 - Stochastic evolution of random matrices
 - Statistical issues involving EOFs in climatology
- *Program leaders:* Iain M. Johnstone (Chair), Craig A. Tracy, Ken McLaughlin; Young Truong (director liaison)

Analysis and Validation of Computer Models (full year)

- Possible subprograms, with complementary emphases:
 - Engineering models
 - Biomedical models
 - Social network models
 - Microsimulation models
 - Environmental / ecological models
 - Combinatorial algorithms

- Program leader: Thomas Santner (and others to be named)
- Collaborations with affiliates will be crucial to the program
 - Summer 2006 short course at LANL is being planned
 - GM will likely be involved, building on the NISS projects in computer modeling
 - Complex models (and the people who know them) are needed as testbeds

Ideas for SAMSI's Second 5 Years

- SAMSI has
 - Third Year Review: March 16-18, 2005
 - 5-year renewal proposal (for 2007-12) due in May, 2006
- Initial ideas for programs include
 - A series of 3 programs (potentially co-sponsored by NIH) on a subset of
 - Clinical trials/FDA
 - Medical imaging
 - Toxicology
 - Neuroscience
 - Agent-Based Simulation
 - Ecology
 - Econometrics
 - Nanotechnology of ?
- New ideas (and leaders) needed!
