http://www.samsi.info/ASTRO

ASTRO Opening Workshop
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Deputy Director

Statistical and Applied Mathematical Sciences Institute
WHAT IS SAMSII?

✧ One of 7 NSF funded Math institutes
✧ A NSF grant (since 2002)

Awarded to Duke, NC State and UNC-CH
MISSION OF SAMSI

• Forge a synthesis of the statistical sciences and the applied mathematical sciences

• with disciplinary science

• to confront the very hardest and most important data- and model-driven scientific challenges
WHAT CAN SAMSI DO FOR YOU?

✧ **Research**

*Year-long programs*
Summer programs
Topical workshops

✧ **Education and Outreach**

Graduate student modeling workshop
Undergraduate workshops
Workshops on Promoting Diversity
Research Activities

• **Working Groups** *(via Webex)*
• SAMSI Courses, Seminars and Colloquia
• Summer School *(for some programs)*
• Workshops *(mid-program, summer)*

• Personnel include long-term visitors, postdocs, faculty fellows, graduate students, remote WG participants
Education & Outreach Activities

• Undergraduate level
  – Summer: Modeling Workshop (5 days)
  – Fall & Spring: Outreach Workshops (1.5 days)

• Graduate level
  – Summer: Industrial Mathematical & Statistical Modeling (IMSM) Workshop (10 days)
  – Fall & Spring: Research Program Courses, Working Groups and Poster Day/Reception

• Promote Diversity in Math Sciences
  – Math Institute Diversity Initiatives
  – Annual and Biennial Workshops (MMW @ SACNAS etc.)
ONGOING AND UPCOMING YEARLONG RESEARCH PROGRAMS

2016-17

• Optimization (www.samsi.info/opt)
  (Opening workshop: August 29 – September 2, 2016)

• Statistical, Mathematical and Computational Methods for Astronomy (www.samsi.info/astro)
  (Opening workshop: August 22-26, 2016)

2017-18

• Mathematical and Statistical Methods for Climate and the Earth System (CLIM)

• Quasi-Monte Carlo and High-Dimensional Sampling Methods for Applied Mathematics (QMC)

https://www.samsi.info/programs-and-activities/
2016-17 Program on Statistical, Mathematical and Computational Methods for Astronomy

The Statistical, Mathematical and Computational Methods for Astronomy Program focuses on the vast range of statistical and mathematical problems arising in modern astronomical and space sciences research, particularly due to the flood of data produced by both ground-based and space-based astronomical surveys at many wave-bands. To cope with the current and future needs of astronomy missions, requires concerted efforts by cross-disciplinary collaborations involving astronomers, computer scientists, mathematicians and statisticians.

The research areas that form the main ingredients of the program include:

- Astronomical Simulations and Big data issues
- Exoplanets
- Functional Data Analysis
- Gravitational Wave Astrophysics
- High-performance computing for Bayesian inference and machine learning
- Lightcurve analysis/Time Domain Astronomy

For more details, visit www.samsi.info/ASTRO
ASTRO: Planning Workshop
(September 21, 2015)
ASTRO: ORGANIZERS

Program Leaders:
G. Jogesh Babu (Penn State, Stat, Chair), Jessi Cisewski (Yale, Stat), Rebekah Dawson (Penn State, Astro), Eric Ford (Penn State, Astro), Ben Farr (U. Chicago, Astro), Eric Feigelson (Penn State), Matthew Graham (Caltech, Astro), Jeff Jewell (JPL, Astro), Tom Loredo (Cornell, Astro), Ashish Mahabal (Caltech, Astro), Ilya Mandel (U. Birmingham, Physics), Chad Schafer (CMU, Stat) and Michele Vallisneri (NASA, Physics)

Directorate Liaison:
Sujit Ghosh (NCSU, Stat) [ghosh@samsi.info]

Local Scientific Coordinators:
Joseph Guinness (NCSU, Stat), Sheila Kannapan (UNC-CH, Astro), Soumendra Lahiri (NCSU, Stat), Ralph Smith (NCSU, Math), Robert Wolpert (Duke, Stat)

SAMSI Postdoctoral Fellows for ASTRO:
David Jones (Duke), Hyungsuk Tak (UNC-CH), David Stenning (Duke)
ASTRO: YEARLONG ACTIVITIES

Proposed Working Groups (as of now):

• **Working Group I**: Uncertainty Quantification and Reduced Order Modeling in Gravitation, Astrophysics, and Cosmology

• **Working Group II**: Synoptic Time Domain Surveys

• **Working Group III**: Time Series Analysis for Exoplanets & Gravitational Waves: Beyond Stationary Gaussian Processes

• **Working Group IV**: Population Modeling & Signal Separation for Exoplanets & Gravitational Waves

• **Working Group V**: Statistics, computation, and modeling in cosmology
Program Workshops and Courses

• Opening Workshop (Aug 22-26, 2016)
• Fall Course (Sep 7 – Nov 30, 2016)
• Exoplanet Workshop (Oct 17-28, 2016)
• Undergraduate Workshop (Oct 24-25, 2016)
• Spring Course (Jan 9 – Apr 28, 2017)
• Transition Workshop (May 8-10, 2017)
• .......
• (Have ideas? Talk to SAMSI Liaison for ASTRO)
ASTRO: OPENING WORKSHOP

What we want to accomplish this week?

• Provide your feedback during presentations, panel discussions and poster sessions

• Meet with the program leaders and convey your ideas

• During breakout sessions you may propose:
  ➢ To create a new WG, or
  ➢ merge two (or more) WGs

• Finalize a list of WGs (Thursday) by identifying group leaders and SAMSI postdocs

• Meet separately as WGs (Friday)

• Begin collaborative work via weekly WG meetings via Webex
PROGRAM REPORTS

- WG leaders should submit an initial report to SAMSI liaison within 2 months of the Opening Workshop (*enlist group leaders, members, goals, anticipated workshops, etc.*)

- Final Reports are to be submitted within two weeks of the transition workshop

- Check out the link: https://www.samsi.info/forms-resources/working-group-leaders/

- Contact the directorate liaison (Sujit Ghosh) for the ASTRO program for further queries
Enjoy The Workshop

Come Visit Us Again

www.samsi.info