

Theoretical Astrophysics

URA Visiting Committee

March 12, 2004

Who We Are

Head: Scott Dodelson
Deputy Head: Albert Stebbins
Scientists: Joshua Frieman
Lam Hui
Rocky Kolb

David Schramm Fellow:

John Beacom
(→ Faculty job at **Ohio State**)

Jochen Weller (← **Cambridge**)

Postdoctoral Fellows:

Nicole Bell
(→ postdoc at **Caltech** or faculty job)

Patrick Greene
(→ postdoc at **Columbia**)

Gianfranco Bertone
Pengjie Zhang

Mark Jackson (← **Columbia**)

Kenji Kadota (← **Berkeley**)

Students:

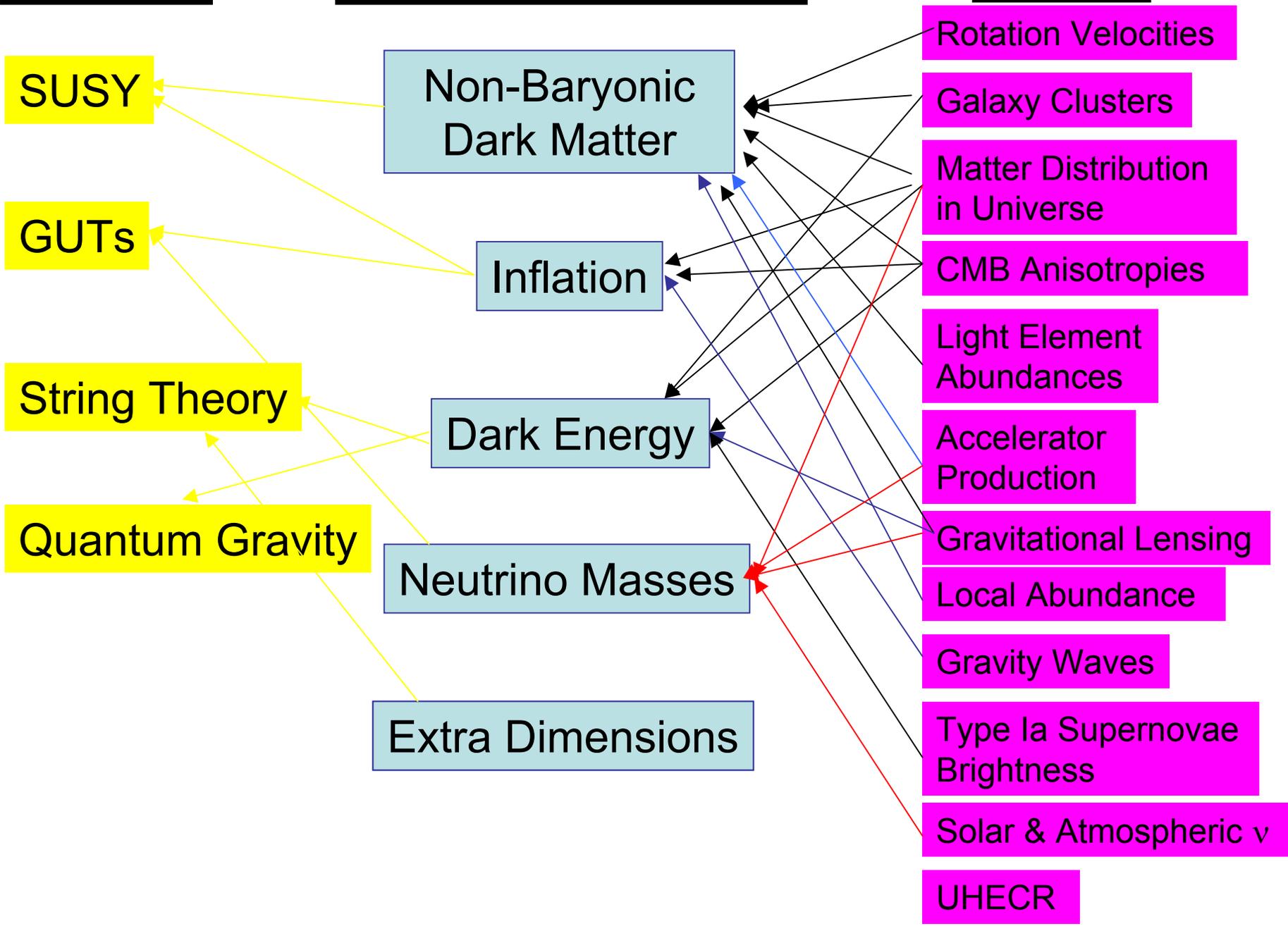
Adam Lidz
(→ postdoc at **Harvard**)

Jun Zhang

Fundamentals

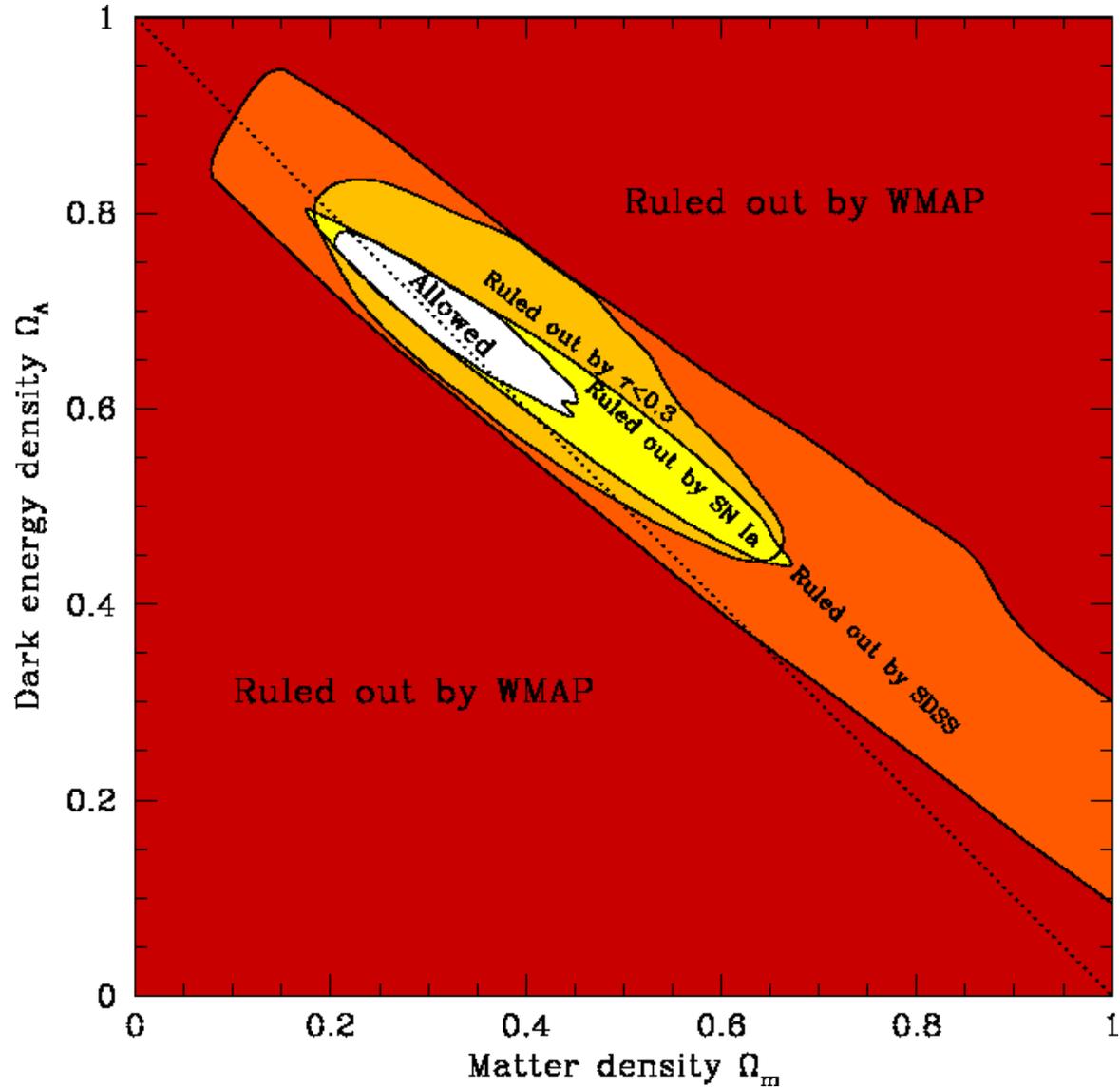
Physics Beyond the Standard Model

Phenomena



What We Do

Dark
Energy
with
SDSS

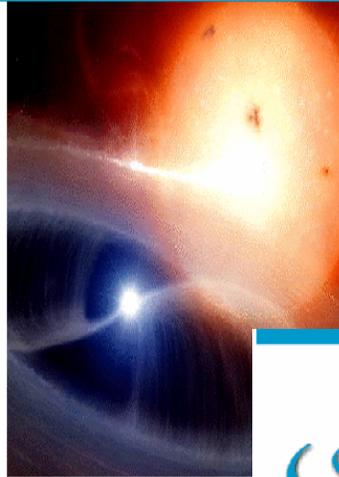


How Are We Doing?

- 32/133 (24%) NASA ATP proposals funded
- Grant for \$245k/year, ~5 times higher than average grant
- Evaluation: “There is no weakness in the group of permanent astro-staff” and “... they arguably constitute the best collection of theoretical cosmologists in the world.” and “The group consistently attracts and trains very good postdocs, and places them in faculty jobs at elite institutions.”

This is a vibrant field

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An immediate four Starry Sky

ISCAP is an interdisciplinary research center within the Departments of [Astrophysics](#) and [Physics](#) at

CENTER FOR COSMOLOGICAL PHYSICS

- About CCPC
- People
- Research
- Seminars
- Visitors
- Workshops
- Education & Outreach
- What's New
- Committees
- Jobs & Opportunities
- Resources (links, talks, and more)
- Local Pages (password required)



CONTACT CCPC

Wednesday March 10, 2004 [New webpages for Center projects](#)

Upcoming Seminars:
 March 11, 2004 Thursday lunch discussion
 Marin Weinstejn, "Quantized Cosmology" SZA at Chicago
 EDGE
 VERTIS at Chicago

March 12, 2004 Friday noon seminar
 Francisco Fraga, "Dark matter in Galaxies: Satellites and Neutrinos"



Suzuki-Zeldovich Array (SZA) is a radio telescope which searches for clusters of galaxies in the Universe using the Suzuki-Zeldovich Effect

Related websites:
[UCHicago Dept. of Physics](#)
[UCHicago Dept. of Astronomy & Astrophysics](#)
[Princeton Sem. Institute](#)

The Center for Cosmological Physics is a Physics Frontier Center of the [National Science Foundation](#), dedicated to pursuing and facilitating world-class research at the physics/astrophysics interface. CCPC is located at the University of Chicago.

Theoretical Cosmology

Research Description

Research Groups

Theoretical

- High Energy Cosmology
- Condensed Matter
- Mathematical Biophysics

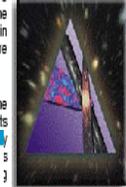
Experimental

- High Energy Astrophysics & Cosmology
- Condensed Matter
- Particle/Nuclear Astrophysics
- Atomic Physics
- Biophysics

Working closely with the experimental group, we use astrophysical, particle physics and superstring theory combined with observations to study gravitation and the origin and evolution of our universe.

The study of the nature of large-scale structure was pioneered in this group two decades ago, and we continue to make leading contributions to theories of the origin of this structure. Crucial elements in the work include the measurements by the experimental group of the 2.73 K thermal background radiation, deep observations of galaxies, and the Sloan Digital Sky Survey that operates out of the neighbouring Department of Astrophysical Sciences. One of the principle areas of research is the theoretical analysis of the cosmic microwave background, large-scale structure, and the expansion of the universe to test and constrain cosmological models and measure cosmological parameters.

The origin of the physical universe and the cosmological model that describes its



The Kavli Institute for Particle Astrophysics and Cosmology was founded in 2003, through a gift by [Fred Kavli](#) and [Kavli Foundation](#).

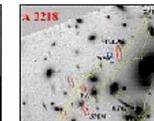
Current News: Our postdoctoral positions for 2004 are now closed. Please click here to view our [open faculty](#) positions.



People



In The News



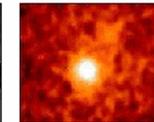
Science



Affiliations



Building Plans



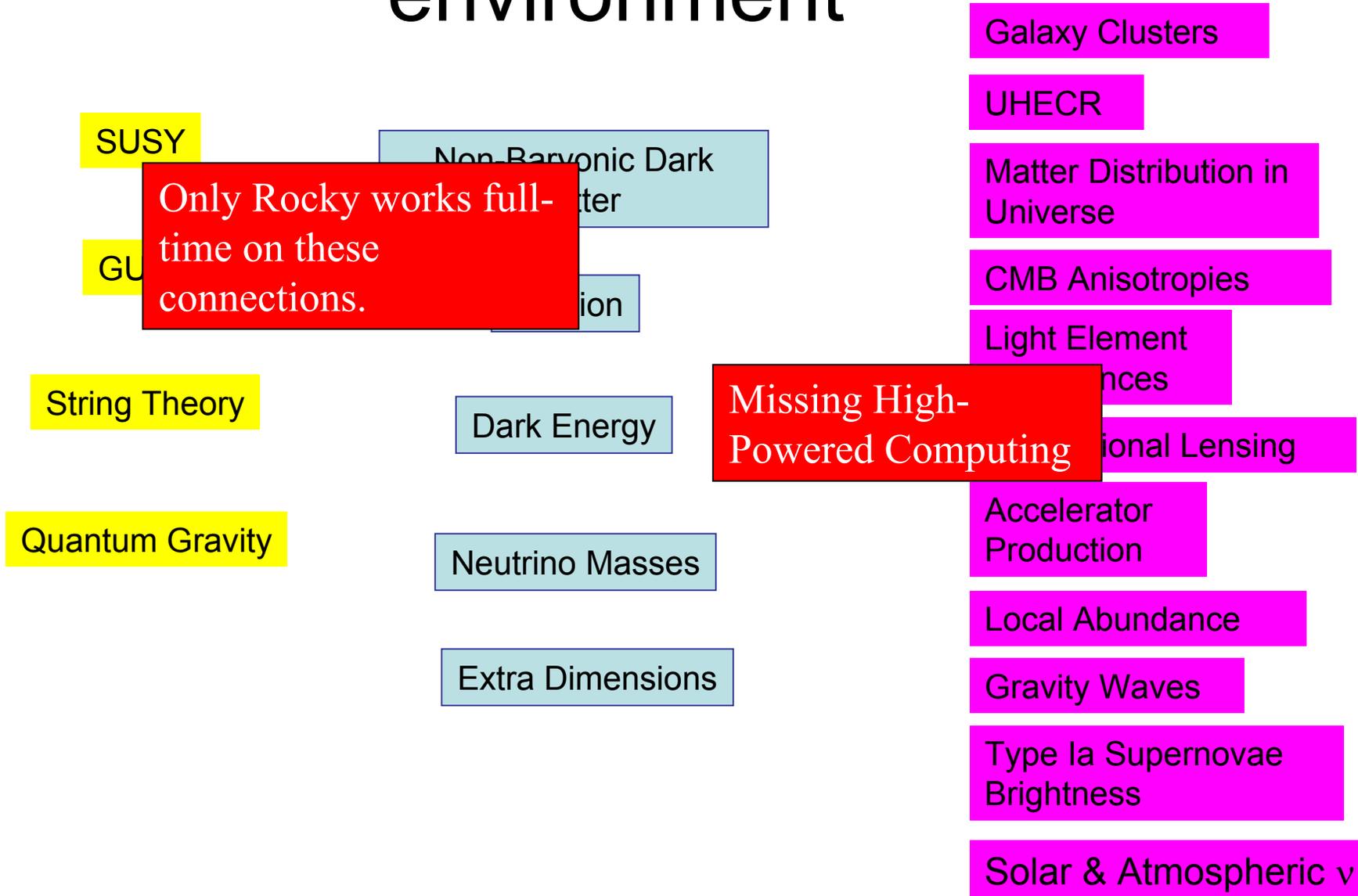
Related Activities

Our Mission is to bridge theoretical and experimental physics communities, and to bring their combined strengths to bear on some of the most challenging and fascinating problems in particle astrophysics and cosmology.

Established Collaborations with many of these groups

- Dodelson, Frieman, Hui, & Kolb part-time faculty at **Chicago** (SDSS, Dark Energy Survey, ...)
- Working on SDSS with **Princeton, Johns Hopkins, ...**
- Working on SNAP with **LBL, Caltech, Michigan, Penn**
- Parallel Computing, Summer Workshops with **LANL**

Challenges in this competitive environment



Fermilab Astrophysics Center

- Unify FNAL astrophysics program, thereby enhancing the overall intellectual environment and recruiting power of individual projects
- Provide the framework in which future efforts will germinate and be advocated
- Attract scientists from FNAL and User community interested in learning about particle astrophysics

Conclusions/Goals

- Vibrant astro-particle group for next 20 years
- Start new projects (SDSS, SNAP@FNAL, Dark Energy Survey, EPIC, ...)
- Strengthen High-Powered Computing & Ties to Fundamental Physics
- Fermilab Astrophysics Center