



The Abdus Salam
**International Centre
for Theoretical Physics**



Summer School on Cosmology

Organizer(s): S. Borgani (INAF - OATS), P. Creminelli (ICTP), A. Paranjape (ICTP), E. Sefusatti (ICTP) U. Seljak (UC & LBNL Berkeley & Zürich U.), R. Sheth (ICTP & UPenn)
Collaboration(s): the Italian Institute for Nuclear Physics (INFN)
Trieste - Italy, 16 - 27 July 2012

Venue: Leonardo da Vinci Building Main Lecture Hall

Programme

Monday, 16 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

16 July 2012

08:30 - 09:55 (Room: Leonardo da Vinci Building, Lobby)
--- REGISTRATION & ADMINISTRATIVE FORMALITIES ---

09:55 - 10:00 **Welcome by the Organizers**

10:00 - 11:00 **M. Sasaki / Yukawa Institute, Kyoto**
Inflation - Lecture 1

11:00 - 11:45 (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---

11:45 - 12:45 **M. Sasaki / Yukawa Institute, Kyoto**
Inflation - Lecture 2

12:45 - 14:15 (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---

14:15 - 15:15 **A. Nicolis / Columbia, New York**
Modified Gravity - Lecture 1

- 15:15 - 16:15** **M. Cirelli / CERN & CNRS Saclay**
Dark Matter - Lecture 1
- 16:15 - 16:45** (Room: Leonardo da Vinci Building Terrace)
 --- Coffee Break ---
- 16:45 - 17:45** **Discussion Session**

Tuesday, 17 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

17 July 2012

- 09:30 - 10:30** **S. Dodelson / FNAL & U. Chicago**
Introduction to Cosmology - Lecture 1
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
 --- Coffee Break ---
- 11:15 - 12:15** **S. Dodelson / FNAL & U. Chicago**
Introduction to Cosmology - Lecture 2
- 12:15 - 13:45** (Room: Leonardo da Vinci Building Cafeteria)
 --- Lunch Break ---
- 13:45 - 14:45** **M. Sasaki / Yukawa Institute, Kyoto**
Inflation - Lecture 3
- 14:45 - 15:45** **M. Cirelli / CERN & CNRS Saclay**
Dark Matter - Lecture 2
- 15:45 - 16:15** (Room: Leonardo da Vinci Building Terrace)
 --- Coffee Break ---
- 16:15 - 17:15** **Discussion Session**
- 20:00 - 22:00** (Room: Adriatico Guest House (Terrace))
 --- RECEPTION ---

Wednesday, 18 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

18 July 2012

- 09:30 - 10:30** **S. Dodelson / FNAL & U. Chicago**
Introduction to Cosmology - Lecture 3
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
 --- Coffee Break ---
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
POSTER PRESENTATIONS
 Linear perturbation on Models with Creation of Cold Dark Matter (Felipe Oliveira - Universidade de Sao Paulo, Brazil) 01'
 A Study of Magnitude Dependence in the Spatial Orientation of Spin Vectors of SDSS Galaxies (Amit Poudel - Golden Gate International College, Kathmandu, Nepal) 01'

Redshift Drift in LTB Models (Florencia A. Teppa Pannia - Universidad Nacional de La Plata, Argentina) 01'

A new log-normal estimator of the correlation function (Julian Bautista - Universite Paris Diderot, France) 01'

Constraining Thawing Dark Energy using Galaxy Cluster Number Counts (Chandrachani Ningombam - Jamia Millia Islamia Central University, New Delhi, India) 01'

Can present observations distinguish between thawing and tracking behaviour? (Shruti Thakur - University of Delhi, India) 01'

Type Ia Supernovae Selection and Forecast of Cosmology Constraints for DES (Eda Gjergo - Illinois Institute of Technology, Chicago, USA) 01'

The cosmic distance duality (Remya Nair - Jamia Millia Islamia Central University, New Delhi, India) 01'

Lagrangian bias in the local bias model (Noemi Frusciante - SISSA, International School for Advanced Studies, Trieste, Italy) 01'

Effective Field Theory of Fluid Dynamics (Solomon Endlich - Columbia University, New York, USA) 01'

A Covariant Minimum Length Scale in Cosmology (Aidan Chatwin-Davies - University of Waterloo, Canada) 01'

Redshift Analysis of Cosmic Voids (Mahdi Khadem - IASBS, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran) 01'

A Tool For Statistical Studies of LSS in Redshift Surveys (Seyed Kaveh Vasei Zadeh Kashani - IPM, Institute for Research in Fundamental Sciences, Tehran, Iran) 01'

From cosmic deceleration to acceleration: new constraints from SN Ia and BAO/CMB (Marcelo Vargas - Universidade Federal do Rio de Janeiro, Brazil) 01'

On the stability of small-scale isothermal fluctuations during recombination (Tejaswi Venumadhav Nerella - California Institute of Technology, Pasadena, USA) 01'

Dark Radiation from a hidden U(1) (Hendrik Vogel - Max Planck Institute for Physics, Munich, Germany) 01'

Is Lambda natural? (Heinrich Steigerwald - Centre de Physique Theorique, Marseille, France) 01'

Study of the cosmological evolution of K-essence Dark Energy Model (Luz Angela Garcia - Universidad Nacional de Colombia, Bogota, Colombia) 01'

Mean transmission and transmission autocorrelation function of the Ly-alpha forest from SDSS DR7 (Ganna Ivashchenko - National Taras Shevchenko University of Kyiv, Ukraine) 01'

11:15 - 12:15 **M. Sasaki / Yukawa Institute, Kyoto**
Inflation - Lecture 4

12:15 - 13:45 (Room: Leonardo da Vinci Building Cafeteria)
 --- Lunch Break ---

13:45 - 14:45 **R. Scoccimarro / NYU, New York**
Large-scale Structure - Lecture 1

14:45 - 15:45 **M. Cirelli / CERN & CNRS Saclay**
Dark Matter - Lecture 3

15:45 - 16:15 (Room: Leonardo da Vinci Building Terrace)
 --- Coffee Break ---

16:15 - 17:15 **Discussion Session**

Thursday, 19 July 2012 (Room: Leonardo da Vinci Building Main Lecture Hall)

19 July 2012

09:30 - 10:30 **R. Scoccimarro / NYU, New York**
Large-scale Structure - Lecture 2

- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 11:15 - 12:15** **M. Cirelli / CERN & CNRS Saclay**
Dark Matter - Lecture 4
- 12:15 - 13:45** (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---
- 13:45 - 14:45** **R. Scoccimarro / NYU, New York**
Large-scale Structure - Lecture 3
- 14:45 - 15:45** **A. Nicolis / Columbia, New York**
Modified Gravity - Lecture 2
- 15:45 - 16:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 16:15 - 17:15** **STUDENTS PRESENTATIONS**
- Modified gravity a la Galileon (Amna Ali - Saha Institute of Nuclear Physics, Kolkata, India) 08'
- Phenomenology of Gravitational Aether as a solution to the Old CC Problem (Siavash Aslanbeigi - Perimeter Institute for Theoretical Physics, University of Waterloo, Canada) 08'
- Massive Cosmologies (Lavinia Heisenberg - Universite de Geneve, Switzerland & Case Western Reserve University, Cleveland, USA) 08'
- Stochastic inhomogeneities and dark-energy precision experiments (Fabien Nugier - Ecole Normale Supérieure, Paris, France) 08'
- Redshift drift as a test for discriminating between different cosmological models (Priti Mishra - Tata Institute of Fundamental Research, Mumbai, India) 08'
- A new method for the Alcock-Paczynski test (Francesco Montanari - Universite de Geneve, Switzerland) 08'
- Cosmological constraints from MaxBCG (Annalisa Mana - Universitaets-Sternwarte Muenchen, Germany) 08'

Friday, 20 July 2012 (Room: Leonardo da Vinci Building Main Lecture Hall)

20 July 2012

- 09:30 - 10:30** **R. Scoccimarro / NYU, New York**
Large-scale Structure - Lecture 4
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 11:15 - 12:15** **A. Nicolis / Columbia, New York**
Modified Gravity - Lecture 3
- 12:15 - 13:45** (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---
- 13:45 - 14:45** **S. Dodelson / FNAL & U. Chicago**
Introduction to Cosmology - Lecture 4
- 14:45 - 15:45** **A. Nicolis / Columbia, New York**
Modified Gravity - Lecture 4

15:45 - 16:15 (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---

16:15 - 17:15 STUDENTS PRESENTATIONS

The clustering of the intergalactic medium at $z = 2.5$ (Timothee Delubac - CEA-Saclay, Gif Sur Yvette, France) 08'

Revisiting the cosmological mass function (Seunghwan Lim - Seoul National University, R. of Korea) 08'

Cosmological lepton asymmetry with a nonzero mixing angle θ_{13} (Emanuele Castorina - SISSA, International School for advanced studies, Trieste, Italy) 08'

Velocity power spectrum in redshift space (Jun Koda - Swinburne University of Technology, Hawthorn, Australia) 08'

The role of baryons in strong lensing properties of simulated galaxy clusters (Madhura Killeddar - Universita di Trieste, Italy) 08'

Reionization constraints using principal component analysis (Sourav Mitra - Harish-Chandra Research Institute, Allahabad, India) 08'

Overlapping Stromgren spheres (Anne Hutter - Leibniz Institute for Astrophysics Potsdam, Germany) 08'

Monday, 23 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

23 July 2012

09:30 - 10:30 **R. Durrer / Geneva U.**
CMB - Lecture 1

10:30 - 11:15 (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---

11:15 - 12:15 **J. Mohr / LMU, Munich**
Clusters - Lecture 1

12:15 - 13:45 (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---

13:45 - 14:45 **W. Percival / ICG, Portsmouth**
Statistics and Data Analysis - Lecture 1

14:45 - 15:45 **J. Mohr / LMU, Munich**
Clusters - Lecture 2

15:45 - 16:15 (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---

16:15 - 17:15 **Discussion Session**

Tuesday, 24 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

24 July 2012

09:30 - 10:30 **R. Durrer / Geneva U.**
CMB - Lecture 2

10:30 - 11:15 (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---

- 11:15 - 12:15** **J. Mohr / LMU, Munich**
Clusters - Lecture 3
- 12:15 - 13:45** (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---
- 13:45 - 14:45** **W. Percival / ICG, Portsmouth**
Statistics and Data Analysis - Lecture 2
- 14:45 - 15:45** **J. Mohr / LMU, Munich**
Clusters - Lecture 4
- 15:45 - 16:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 16:15 - 17:15** **STUDENTS PRESENTATIONS**
Testing Multi-Field Inflation with Large-Scale Structure Bias (Matteo Biagetti - Universite de Geneve, Switzerland) 08'
Non-Gaussian bubbles in the sky (Kazuyuki Sugimura - Kyoto University, Japan) 08'
Slow Roll Corrections to the Volume of the Universe (Ashley Perko - Stanford University, USA) 08'
Solid Inflation (Junpu Wang - Columbia Univeristy, New York, USA) 08'
Dark Matter relic abundance in multi-component Dark Matter scenarios (Aleksandra Drozd - University of Warsaw, Poland) 08'
Bose-Einstein Condensate Dark Matter Phase Transition (Abril Suarez - Centro de Investigacion y de Estudios Avanzados del I.P.N., Mexico) 08'
Is it possible to detect a phase transition in dark matter? (Jorge Mastache - Universidad Nacional Autonoma de Mexico, Mexico) 08'

Wednesday, 25 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

25 July 2012

- 09:30 - 10:30** **W. Percival / ICG, Portsmouth**
Statistics and Data Analysis - Lecture 3
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
POSTER PRESENTATIONS
Brachistochrone problem in Schwarzschild (Andrii Kuzmak - Ivan Franko National University of Lviv, Ukraine) 01'
Testing Unimodular Gravity (Purnendu Karmakar - IIT Indian Institute of Technology Kanpur, India) 01'
Inflationary Models and Precision Cosmology (Muhammad Nadeem Ahmad - Quaid-i-Azam University, Islamabad, Pakistan) 01'
Standard Model Higgs as an inflaton (Noor ul Ain - Quaid-i-Azam University, Islamabad, Pakistan) 01'
Homogeneous and Inhomogeneous universe (Sara Benchikh - University Mentoury Constantine, Algeria) 01'
Cosmic microwave background non-Gaussianity estimation with Planck (Benjamin Racine - Laboratoire APC, Paris, France) 01'
Naked Singularities as Possible Outcomes of Gravitational Collapse Scenario (Amir Hadi Ziaie - Shahid-Beheshti University, Tehran, Iran) 01'
Scalar-tensor theories with non-standard kinetic terms: the Galileon (Emilio Bellini - Universita degli Studi di Padova, Italy) 01'

Interacting fields in DeSitter spacetime: non-perturbative approaches (Leonardo Trombetta - University of Buenos Aires, Argentina) 01'

Search for Local Kink in the CMB Power Spectrum (Hossein Moshafi - IASBS, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran) 01'

De Sitter Solutions in Nonlocal Modified Gravity (Ekaterina Pozdeeva - Lomonosov Moscow State University, Moscow, Russia) 01'

Brane inflation (Sayantan Choudhury - Indian Statistical Institute, Kolkata, India) 01'

On the origin of brane cosmological constant in two-brane warped geometry model (Sayantani Lahiri - Jadavpur University, Kolkata, India) 01'

A model to localize gauge fields on thick branes (Augusto E. Rueda Chumbes - UNESP FEG, Sao Paulo State University, Brazil) 01'

Constraining Thawing Quintessence (Gaveshna Gupta - Jamia Millia Islamia Central University, New Delhi, India) 01'

TeV ϵ S Gravity from Metric-Affine Gravity (Canan Nurhan Karahan - Izmir Institute of Technology, Izmir, Turkey) 01'

Effect of initial conditions of inflation on cosmological fluctuations (Aditya Aravind - The University of Texas at Austin, USA) 01'

Prospects for constraining Dark Energy and Early Universe with lensed CMB (Claudia Antolini - SISSA, International School for Advanced Studies, Trieste, Italy) 01'

Gauge-flation (Azadeh Malek Nejad - IPM, Institute for Studies in Theoretical Physics and Mathematics, Tehran, Iran) 01'

$f(R)$ theories: the stability of stars (Sergio E. Joras - Universidade Federal do Rio de Janeiro, Brazil) 01'

Neutron Stars in Alternate Theories of Gravity (Vildan Tugyanoglu - Istanbul Technical University, Turkey) 01'

Cylindrically Symmetric solutions in $f(R)$ Gravity with constant R (Monica T. Ricon Ramirez - Universidad Nacional de Colombia, Bogota, Colombia) 01'

Cosmic acceleration from a modified gravity (Dagmawi Berhanu Tadesse - Addis Ababa University, Ethiopia) 01'

Flattening of velocity dispersion profile of globular clusters (Mohammad Hassan Naddaf Moghaddam - IASBS, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran) 01'

The outskirts of globular clusters as modified gravity probes (Maria A. Jimenez Zuniga - Universidad Autonoma de Mexico, Mexico) 01'

Vacuum energy problem (Abhiram Mamandur Kidambi - University of Nottingham, UK) 01'

Detecting Stochastic GWs due to Non-linear Structure Formation (Abhilash Mishra - California Institute of Technology, Pasadena, USA) 01'

11:15 - 12:15

C. Baugh / ICC, Durham U.
Galaxy formation - Lecture 1

12:15 - 13:45

(Room: Leonardo da Vinci Building Cafeteria)
 --- Lunch Break ---

13:45 - 14:45

W. Percival / ICG, Portsmouth
Statistics and Data Analysis - Lecture 4

14:45 - 15:45

C. Baugh / ICC, Durham U.
Galaxy formation - Lecture 2

15:45 - 16:15

(Room: Leonardo da Vinci Building Terrace)
 --- Coffee Break ---

16:15 - 17:15

B. Bassett / AIMS, U. Cape Town
Supernovae

Thursday, 26 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

26 July 2012

- 09:30 - 10:30** **C. Baugh / ICC, Durham U.**
Galaxy formation - Lecture 3
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 11:15 - 12:15** **H. Hoekstra / Leiden Observatory**
Lensing - Lecture 1
- 12:15 - 13:45** (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---
- 13:45 - 14:45** **C. Baugh / ICC, Durham U.**
Galaxy formation - Lecture 4
- 14:45 - 15:45** **H. Hoekstra / Leiden Observatory**
Lensing - Lecture 2
- 15:45 - 16:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 16:15 - 17:15** **Discussion Session**

Friday, 27 July 2012 (Room:Leonardo da Vinci Building Main Lecture Hall)

27 July 2012

- 09:30 - 10:30** **R. Durrer / Geneva U.**
CMB - Lecture 3
- 10:30 - 11:15** (Room: Leonardo da Vinci Building Terrace)
--- Coffee Break ---
- 11:15 - 12:15** **H. Hoekstra / Leiden Observatory**
Lensing - Lecture 3
- 12:15 - 13:45** (Room: Leonardo da Vinci Building Cafeteria)
--- Lunch Break ---
- 13:45 - 14:45** **R. Durrer / Geneva U.**
CMB - Lecture 4
- 14:45 - 15:45** **H. Hoekstra / Leiden Observatory**
Lensing - Lecture 4