

CHIRAG MODI

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Education

University of California, Berkeley — Berkeley, CA

Fall 2014–Present

Ph.D. student in Physics

GPA: 3.887/4.0

Master of Arts in Physics

May, 2017

Indian Institute of Technology Bombay — Mumbai, India

Fall 2010 – Spring 2014

Bachelor of Technology (with Honors) in Engineering Physics

CPI: 9.64/10

Bachelor of Technology (Minor) in Statistics

Silver Medal, Graduated top of the Physics Class

Research Interests

Cosmology: Large Scale Structures, Intensity Mapping, Halo Modeling, Perturbation Theories

Statistics: Machine Learning, Statistical Modeling and Inference, Optimization

Publications

Led/Co-Led

Reconstructing large-scale structure with neutral hydrogen surveys

Modi C., White M., Slosar A., Castorina E. (*arXiv:1907.02330*)

Submitted to JCAP

Intensity mapping with neutral hydrogen and the Hidden Valley simulations

Modi C., Feng Y., White M., Castorina E. (*arXiv:1904.11923*)

Submitted to JCAP

Cosmological Reconstruction From Galaxy Light: Neural Network Based Light-Matter Connection

Modi C., Feng Y., Seljak U. (*arXiv:1805.02247*)

JCAP10(2018)028

Towards Optimal Extraction of Cosmological Information from Non-linear Data

Seljak U., Aslanyan G., Feng Y., **Modi C.** (*arXiv:1706.06645*)

JCAP 12(2017)009

Modeling CMB lensing cross correlations with CLEFT

Modi C., White M., Vlah Z. (*arXiv:1706.03173*)

JCAP 08(2017)009

Halo Bias in Lagrangian Space: Estimators and Theoretical Predictions

Modi C., Castorina E., Seljak U. (*arXiv:1612.01621*)

MNRAS 472,3959 (2017)

A Fast Algorithm for Identifying Friends-of-Friends Halos

Feng Y., **Modi C.** (*arXiv:1607.03224*)

A&C 20(2017)44-51

Local Random Potentials of High Differentiability to Model the Landscape

Battefeld T., **Modi C.** (*arXiv:1409.5135*)

JCAP 03(2015)010

Member of Main Science Team

nbbodykit: an open-source, massively parallel toolkit for large-scale structure

Hand N., et al. (including **CM**) (*arXiv:1712.05834*)

The Astronomical Journal, (Oct, 2018)

The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: Anisotropic galaxy clustering in Fourier-space

Beutler F., et al. (including **CM**) (*arXiv:1607.03150*)

MNRAS, 466, 2242 (2016)

The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations in Fourier-space

Beutler F., et al. (including **CM**) (*arXiv:1607.03149*)

MNRAS, 464, 3409, (2016)

Work in Progress

On the validity of the Born approximation in modeling cross correlations

Boehm V., **Modi C.**, Castorina E. (*arXiv:1903.xxxxx*)

To be submitted to JCAP

Talks

Paving the way for next generation of cosmological surveys, SCA, Sesto, Italy	July 2018
Cosmology Seminar, MPA, Garching, Germany	July 2018
The Nonlinear Universe 2018, BCCP, Smartno, Slovenia	July 2018
Modeling the Extragalactic Sky, BCCP, Berkeley, CA	Jan 2018
Low Redshift Universe, Nordita, Stockholm, Sweden	July 2017
The Non Linear Universe, BCCP & CCA, Smartno, Slovenia	July 2017
DESI Lunch Talk, Lawrence Berkeley National Lab, Berkeley, CA	December 2016

Posters

Quantifying and Understanding the Galaxy-Halo Connection <i>Kavli Institute of Theoretical Physics, UC Santa Barbara, Santa Barbara, CA</i>	May 2017
Prospective Graduate Student Open House <i>Department of Physics, UC Berkeley, Berkeley, CA</i>	March 2017 & 2018
6th Workshop on Algorithms for Modern Massive Data Sets (MMDS) <i>BIDS & UC Berkeley, Berkeley, CA</i>	June 2016

Teaching Experience

Teaching Assistant , UC Berkeley, Physics <i>Assisted in developing course - "Data science and Bayesian statistics for physical sciences"</i>	Fall 2017
Graduate Student Instructor , UC Berkeley, Physics <i>Over 3 semesters; Courses- Mechanics and Wave Motion, Honor Sequence Course</i>	Fall 2014-Fall 2015
Teaching Assistant Instructor , IIT Bombay, Physics <i>Over 6 semesters; Courses- Quantum Mechanics, Modern Physics, Electricity and Magnetism</i>	Fall 2011-Spring 2014
Olympiad Facilitator , OCSC- International Astronomy Olympiad, HBCSE-TIFR, India <i>Academic Training: Selection and Preparation of Indian Team for International Astronomy Olympiads</i>	Summer 2010
Instructor , Splash at Berkeley <i>Outreach Program: Taught courses such as Amateur Astronomy, Card Games from India</i>	Fall 2015 - Fall 2017

Awards and Recognitions

World Rank 2 & Gold Medal <i>International Olympiad of Astronomy and Astrophysics</i>	Beijing, China, 2010
Gold Medal <i>International Astronomy Olympiad</i>	Hongzhou, China, 2009
DAAD WISE Scholarship - Deutscher Akademischer Austausch Dienst (DAAD) <i>German Academic Exchange Service</i>	Germany, Summer, 2010
All India Rank 48 - Joint Entrance Examination <i>Indian Institute of Technology (over 500,000 students take the exam)</i>	India, 2010
KVPY Fellowship - Kishore Vaigyanik Protsahan Yojna <i>Government of India</i>	India, 2009-2010
NTSE Fellowship - National Talent Search Scholarship <i>Government of India</i>	India, 2008-2010

Skills

Conversant with **OS**: Windows and UNIX systems, **Tools**: Version Control (Git), Emacs
Extensive experience with Python - databases, scikit-learn, scikit-image, web-frameworks
Extensive experience with TensorFlow, Tensorflow Probability, Keras, PyTorch
Working knowledge of C/C++, Mathematica, Matlab