

Michael J. Mortonson

CONTACT INFORMATION

Center for Cosmology and AstroParticle Physics
Department of Physics
The Ohio State University
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EDUCATION

University of Chicago, Chicago, Illinois USA

Ph.D., Physics, August, 2009

Dissertation Topic: “Testing flatness of the universe with probes of cosmic distances and growth”

Advisor: Wayne Hu

Massachusetts Institute of Technology, Cambridge, Massachusetts USA

S.B., Physics, June, 2004

POSITIONS

CCAPP Postdoctoral Fellow, Department of Physics, The Ohio State University, 2009 – present

FELLOWSHIPS AND AWARDS

National Science Foundation Graduate Research Fellowship, 2005

Sachs Fellowship, University of Chicago, 2005

Michelson Fellowship, University of Chicago, 2004

McCormick Fellowship, University of Chicago, 2004

Joel Matthew Orloff Award for Outstanding Scholarship in Physics, Massachusetts Institute of Technology, 2004

Sigma Pi Sigma, 2004

Phi Beta Kappa, 2004

Edward J. Chatterton Scholar, MIT School of Science, 2002

PUBLICATIONS

- [22] Weinberg, D. H., Mortonson, M. J., Eisenstein, D. J., Hirata, C., Riess, A. G., & Rozo, E. (2012) “Observational Probes of Cosmic Acceleration.” To appear in *Physics Reports* (e-print: arXiv:1201.2434).
- [21] Mortonson, M. J., Hu, W., & Huterer, D. (2011) “Simultaneous falsification of Λ CDM and quintessence with massive, distant clusters.” *Physical Review D* 83, 023015 (e-print: arXiv:1011.0004).
- [20] Mortonson, M. J., Peiris, H. V., & Easther, R. (2011) “Bayesian analysis of inflation: Parameter estimation for single field models.” *Physical Review D* 83, 043505 (e-print: arXiv:1007.4205).
- [19] Mortonson, M. J. (2010) “Testing generic predictions of dark energy.” *Proceedings of the 45th Rencontres de Moriond Cosmology Session* (e-print: arXiv:1005.3716).
- [18] Mortonson, M. J., Huterer, D., & Hu, W. (2010) “Figures of merit for present and future dark energy probes.” *Physical Review D* 82, 063004 (e-print: arXiv:1004.0236).
- [17] Mortonson, M. J., & Hu, W. (2010) “Observational limits on patchy reionization: Implications for B-modes.” *Physical Review D* 81, 067302 (e-print: arXiv:1001.4803).
- [16] Mortonson, M. J., Hu, W., & Huterer, D. (2010) “Testable dark energy predictions from current data.” *Physical Review D* 81, 063007 (e-print: arXiv:0912.3816).
- [15] Mortonson, M. J. (2009) “Testing flatness of the universe with probes of cosmic distances and growth.” *Physical Review D* 80, 123504 (e-print: arXiv:0908.0346).

- [14] Mortonson, M. J., Hu, W., & Huterer, D. (2009) “Hiding dark energy transitions at low redshift.” *Physical Review D* 80, 067301 (e-print: arXiv:0908.1408).
- [13] Mortonson, M. J., & Hu, W. (2009) “Evidence for horizon-scale power from CMB polarization.” *Physical Review D* 80, 027301 (e-print: arXiv:0906.3016).
- [12] Mortonson, M. J., Dvorkin, C., Peiris, H. V., & Hu, W. (2009) “CMB polarization features from inflation versus reionization.” *Physical Review D* 79, 103519 (e-print: arXiv:0903.4920).
- [11] Mortonson, M. J., Hu, W., & Huterer, D. (2009) “Falsifying paradigms for cosmic acceleration.” *Physical Review D* 79, 023004 (e-print: arXiv:0810.1744).
- [10] Zaldarriaga, M., Colombo, L., Komatsu, E., Lidz, A., Mortonson, M., Oh, S. P., Pierpaoli, E., Verde, L., & Zahn, O. (2008) “Reionization Science with the Cosmic Microwave Background.” *AIP Conference Proceedings* 1141, 179 (e-print: arXiv:0811.3918).
- [9] Mortonson, M. J., & Hu, W. (2008) “Reionization constraints from five-year WMAP data.” *Astrophysical Journal Letters* 686, L53 (e-print: arXiv:0804.2631).
- [8] Mortonson, M. J., & Hu, W. (2008) “Impact of reionization on CMB polarization tests of slow-roll inflation.” *Physical Review D* 77, 043506 (e-print: arXiv:0710.4162).
- [7] Mortonson, M. J., & Hu, W. (2008) “Model-Independent Constraints on Reionization from Large-Scale Cosmic Microwave Background Polarization.” *Astrophysical Journal* 672, 737 (e-print: arXiv:0705.1132).
- [6] Mortonson, M. J., & Hu, W. (2007) “The Maximum B-mode Polarization of the Cosmic Microwave Background from Inhomogeneous Reionization.” *Astrophysical Journal* 657, 1 (e-print: astro-ph/0607652).
- [5] Mortonson, M. J., Schechter, P. L., & Wambsganss, J. (2005) “Size is Everything: Universal Features of Quasar Microlensing with Extended Sources.” *Astrophysical Journal* 628, 594 (e-print: astro-ph/0408195).
- [4] Hunter, D. A., Elmegreen, B. G., Dupuy, T. J., & Mortonson, M. (2003) “Cluster Mass Functions in the Large and Small Magellanic Clouds: Fading and Size of Sample Effects.” *Astronomical Journal* 126, 1836 (e-print: astro-ph/0306528).
- [3] Mortonson, M. J., Vassiliou, C. C., Ottaway, D. J., Shoemaker, D. H., & Harry, G. M. (2003) “Effects of Electrical Charging on the Mechanical Q of a Fused Silica Disk.” *Review of Scientific Instruments* 74, 4840 (e-print: gr-qc/0308001).
- [2] Smith, J. R., Harry, G. M., Betzwieser, J. C., Gretarsson, A. M., Guild, D. A., Kittelberger, S. E., Mortonson, M. J., Penn, S. D., & Saulson, P. R. (2003) “Mechanical Loss Associated with Silicate Bonding of Fused Silica.” *Classical and Quantum Gravity* 20, 5039.
- [1] Penn, S. D., Sneddon, P. H., Armandula, H., Betzwieser, J. C., Cagnoli, G., Camp, J., Crooks, D. R. M., Fejer, M. M., Gretarsson, A. M., Harry, G. M., Hough, J., Kittelberger, S. E., Mortonson, M. J., Route, R., Rowan, S., Vassiliou, C. C. (2003) “Mechanical Loss in Tantalum/Silica Dielectric Mirror Coatings.” *Classical and Quantum Gravity* 20, 2917 (e-print: gr-qc/0302093).

INVITED
PRESENTATIONS

- [16] Ohio State Astronomy Colloquium (first of 5 10-minute talks) November, 2011
“The Dark Energy Survey.”
- [15] Carnegie Mellon University Astro Seminar October, 2011
“How to Restrict, Reconstruct, and Rule Out Dynamical Dark Energy.”
- [14] DES Collaboration Meeting, University of Portsmouth, UK June, 2011
“Nonparametric Reconstruction Methods.”
- [13] Case Western Reserve University Particle Astrophysics Seminar March, 2011
“Testing Dark Energy with Massive Galaxy Clusters.”
- [12] DES Collaboration Meeting, CIEMAT, Madrid, Spain May, 2010
“Model-independent Likelihood Analysis for DES.”

- [11] University of Illinois at Urbana-Champaign HETEP Seminar
“Testing Flatness of the Universe with Cosmic Distances and Growth.” October, 2009
- [10] The Path to CMBPol Workshop, University of Chicago
“Reionization Science from the CMB after Planck.” July, 2009
- [9] Ohio State CCAPP Seminar
“Falsifying Paradigms for Cosmic Acceleration.” January, 2009
- [8] Jet Propulsion Laboratory Planck Seminar
“CMB Probes of the Reionization History and the Dark Energy Equation of State.” January, 2009
- [7] University of Michigan HEP/Astrophysics Seminar
“Falsifying Paradigms for Cosmic Acceleration.” December, 2008
- [6] SNAP Collaboration Teleconference
“Falsifying Paradigms for Cosmic Acceleration.” November, 2008
- [5] U. Chicago KICP External Advisory Board Meeting
“Consistent Cosmology.” October, 2008
- [4] CMB Polarization Theory and Foregrounds Workshop, Fermilab
“Parameter Estimation with General Reionization Histories.” June, 2008
- [3] SNAP Collaboration Meeting, Fermilab
“A Decision Tree for Dark Energy.” May, 2008
- [2] Caltech TAPIR Seminar
“Reionization from WMAP5 and Beyond.” April, 2008
- [1] UC Berkeley Cosmology Seminar
“Reionization from WMAP5 and Beyond.” April, 2008

CONTRIBUTED
PRESENTATIONS

- [5] DEUS 2011 Conference, Dark Cosmology Centre, Copenhagen, Denmark
“Sharpening Predictions for the Quintessence Model Class.” August, 2011
- [4] CCAPP Symposium 2011, Ohio State University
“Precision Goals for Redshift-Space Distortions.” April, 2011
- [3] 45th Rencontres de Moriond Cosmology Session, La Thuile, Italy
“Testing Generic Predictions of Dark Energy.” March, 2010
- [2] CCAPP Symposium 2009, Ohio State University
“Testing Generic Predictions of Dark Energy.” October, 2009
- [1] Santa Fe ‘07 LANL Cosmology Summer Workshop
“Model-independent Constraints on Reionization from Large-Scale CMB Polarization.” July, 2007

POSTERS

- [4] 10th Great Lakes Cosmology Workshop, University of Chicago
“A General Inflation Code for CMB Likelihood Analysis.” June, 2010
- [3] Essential Cosmology for the Next Generation, Los Cabos, Mexico
“Falsifying Paradigms for Cosmic Acceleration.” January, 2009
- [2] 24th Texas Symposium on Relativistic Astrophysics
“Falsifying Paradigms for Cosmic Acceleration.” December, 2008
- [1] AAS 203rd Meeting
“Commissioning a New X-Ray Microcalorimeter for Laboratory Astrophysics.” January, 2004

ADDITIONAL
EXPERIENCE

The Ohio State University Physics Department

Graduate student advisor

April, 2010 – present

Developed and led a cosmology reading course for a small group of Ohio State physics graduate students. Selected papers for students to read covering a broad range of topics and answered questions on the material. Suggested research projects for two students, Kenneth Patton and Michael Obranovich, and met regularly with them to collaborate on these projects.

Cosmology journal club leader

September, 2009 – present

Organized a weekly journal club at Ohio State with the purpose of discussing recent cosmology papers. The club is attended regularly by several faculty members, postdoctoral fellows, and graduate students, all of whom are encouraged to select papers and post them to the journal club web site at <https://sites.google.com/site/ccappcosmolunch/>.

Journal Peer Review

Referee

January, 2009 – present

Reviewed 19 articles submitted for publication to journals including Nature, Physical Review Letters, Physical Review D, the Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Physics Letters B, and the Journal of Cosmology and Astroparticle Physics. Named a Most Valued Reviewer of 2010 by Physics Letters B.

CMB Polarization Theory and Foregrounds Workshop

Member of Reionization Working Group

June – November, 2008

Contributed to discussion and wrote sections of a report on future CMB polarization satellite experiments for the 2010 Astronomy and Astrophysics Decadal Survey of the National Research Council.

University of Chicago Physics Department

Admissions committee member

January – April, 2006

Reviewed and evaluated applications from prospective physics graduate students.

Center for Space Research, Massachusetts Institute of Technology

Instructor for Chandra Science Summer Program

May – August, 2004

Prepared instructional materials and activities for an astronomy program for about 25 Boston-area high school students. Led activities and instructed students during the two-week program. Evaluated impact of the program to plan for subsequent years by regularly monitoring students' understanding of astronomy concepts.