

# CURRICULUM VITAE

Marcos Lima

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CURRENT ADDRESS	Departamento de Física Matemática Universidade de São Paulo Rua do Matão, Travessa R, 187, C342 São Paulo, SP, 19104, Brazil	Phone: +55 (11) 3091-6949 Fax: +55 (11) 3091-6833 mlima@fma.is.usp.br <a href="http://www.fma.if.usp.br/~mlima">http://www.fma.if.usp.br/~mlima</a>
POSITIONS	2011-present 2010-2011 2008-2010 2002-2008	<b>Assistant Professor</b> , Universidade de São Paulo <b>Postdoctoral Researcher</b> , Universidade de São Paulo <b>Postdoctoral Researcher</b> , University of Pennsylvania <b>Research/Teaching Assistant</b> , University of Chicago
EDUCATION	2008 2004 2002 2001	<b>Ph.D. in Physics</b> , University of Chicago, Chicago-IL <b>M.S. in Physics</b> , University of Chicago, Chicago-IL <b>M.S. in Physics</b> , University of Brasilia, Brazil <b>B.S. in Physics</b> , University of Brasilia, Brazil
FELLOWSHIPS	2011-2014 2010-2011 2002-2006 2001-2002 1999-2001	Productivity PQ-2      CNPq (Brazil) Postdoctoral Fellowship      FAPESP (Brazil) Graduate Fellowship      CNPq (Brazil) Graduate Fellowship      CAPES (Brazil) Undergraduate Fellowship      CNPq (Brazil)
AWARDS	2001	Best work on theoretical physics in the workshop of undergraduate fellows (University of Brasilia, Brazil)
RESEARCH INTERESTS	Cosmological Probes; Statistics of Galaxy Clusters and Gravitational Lensing; Photometric Redshifts; Structure Formation; Modified Gravity Theories; N-Body Simulations; Particle Astrophysics; Statistical Methods; Early Universe.	
RESEARCH PROJECTS	2009-present	<b>Dynamical Mass Measurements:</b> Computation of velocity dispersion of satellite galaxies around hosts in gravitationally bound systems. Estimation of stacked mass and surface density profiles. Application to SDSS spectroscopic galaxies and ACT clusters. Comparison to surface density profile from lensing measures to constrain modified gravity theories.
	2008-present	<b>Gravitational Lensing:</b> Magnification of background galaxies by foreground galaxy clusters and effects on cluster detection and mass estimates. Applications to BLAST sources and ACT clusters.

- 2007-present      **N-body Simulations and Modified Gravity:** Development of a Particle-Mesh code to perform N-body simulations of modified gravity theories. Effects on nonlinear growth and abundance of dark matter halos.
- 2005-present      **Neutrino-scalar interactions:** Effects of neutrino/scalar interactions on large-scale structure observables.
- 2004-present      **Photometric Redshifts:** Development of techniques to estimate photometric redshifts, their errors and their distribution. Applications to the SDSS DR5, DR6, DR7 catalogs. Applications to mock catalogs of the DES and of the J-PAS.
- 2003-present      **Galaxy Clusters:** Forecasts of dark energy constraints for future cluster surveys, employing self-calibration techniques.
- 1999-2003        **Condensed Matter Physics:** Generalized random walks; Models of Growth by Deposition; Nonextensive Statistical Mechanics; Diffusive Systems.

- ACTIVITY        2008-present      Referee for the *Astrophysical Journal (ApJ)*  
 2010-present      Referee for the *Monthly Notices of the Royal Astronomical Society (MNRAS)*

- TEACHING        **University of Brasilia**  
 1998 Teaching Monitor - Physics I (Mechanics), *Spring*.  
 2000 Tutor                      - Calculus III (Multidimensional Calculus), *Spring*.  
 2001 Teaching Assistant - Physics I (Mechanics), *Spring*.

TM: Led weekly lab sessions; graded lab reports.

Tut: Held weekly office hours.

TA: Led weekly discussion sessions.

**University of Chicago**

- 2002 Teaching Assistant - Phys 131 (Mechanics), *Autumn*;  
 2003 Teaching Assistant - Phys 132 (Electromagnetism), *Winter*;  
    Phys 133 (Optics & Quantum Physics), *Spring*;  
    Phys 154 (Modern Physics), *Autumn*;  
 2004 Teaching Assistant - Phys 112 (Modern Physics), *Winter*;  
    PhySci 120 (Cosmology), *Spring*;  
    Phys 235 (Quantum Mechanics), *Autumn*;

2005 Teaching Assistant - Phys 122 (Electromagnetism), *Winter*;  
2006 Teaching Assistant - Phys 122 (Electromagnetism), *Winter*.

TA: Led weekly discussion sessions and lab sessions; held office hours; graded homeworks, lab reports and exams.

### University of São Paulo

2011 Instructor - Phys III (Electromagnetism), *1º Semester*;  
Phys IV (Optics & Modern Physics), *2º Semester*;

### PUBLICATIONS

21. *Measuring Large-Scale Structure with Quasars in Narrow-Band Filter Surveys*  
L. R. Abramo, M. Strauss, **M. Lima**, C. Hernández-Monteagudo, R. Lazkoz, M. Moles, C. M. de Oliveira, I. Sendra, L. Sodré Jr.,  
*Mon. Not. R. Astron. Soc.* (submitted), arXiv:1108.2657
20. *Submillimeter Galaxy Number Counts and Magnification by Galaxy Clusters*  
**M. Lima**, B. Jain, M. Devlin, J. Aguirre,  
*ApJL*. **717**, L31 (2010), arXiv:1004.4889.
19. *Magnification Effects on Source Counts and Fluxes*  
B. Jain, **M. Lima**,  
*Mon. Not R. Astron. Soc.* **411**, 2113 (2011), arXiv:1003.6127.
18. *Spherical Collapse and the Halo Model in Braneworld Gravity*,  
F. Schmidt, W. Hu, **M. Lima**,  
*Phys. Rev. D* **81**, 063005 (2010), arXiv:0911.5178.
17. *Lensing Magnification: Implications for Counts of Submillimeter Galaxies and SZ Clusters*,  
**M. Lima**, B. Jain, M. Devlin,  
*Mon. Not R. Astron. Soc.* **406**, 2352 (2010), arXiv:0907.4387.
16. *The Seventh Data Release of the Sloan Digital Sky Survey*,  
K. Abazajian et al.,  
*ApJS*. **182**, 543 (2009), arXiv:0812.0649.
15. *Non-linear Evolution of  $f(R)$  Cosmologies III: Halo Statistics*,  
F. Schmidt, **M. Lima**, H. Oyaizu, W. Hu,  
*Phys. Rev. D* **79**, 083518 (2009), arXiv:0812.0545.
14. *Estimating the Redshift Distribution of Photometric Galaxy Samples II: Applications and Tests of a New Method*  
C. Cunha, **M. Lima**, H. Oyaizu, J. Frieman, H. Lin,  
*Mon. Not. R. Astron. Soc.* **396**, 2379 (2009), arXiv:0810.2991.

13. *Non-linear Evolution of  $f(R)$  Cosmologies II: Power Spectrum*,  
H. Oyaizu, **M. Lima**, W. Hu,  
*Phys. Rev. D* **78**, 123524 (2008), arXiv:0807.2462.
12. *Estimating the Redshift Distribution of Photometric Galaxy Samples*  
**M. Lima**, C. Cunha, H. Oyaizu, E. Sheldon, J. Frieman, H. Lin,  
*Mon. Not. R. Astron. Soc.* **390**, 118 (2008), arXiv:0801.3822.
11. *Photometric Redshift Error Estimators*,  
H. Oyaizu, **M. Lima**, C. Cunha, H. Lin, J. Frieman,  
*ApJ.* **689**, 709 (2008), arXiv:0711.0962.
10. *Photometric Redshift Requirements for Self-Calibration of Cluster Dark Energy Studies*,  
**M. Lima** and W. Hu,  
*Phys. Rev. D* **76**, 123013 (2007), arXiv:0709.2178.
9. *Cross-correlation Weak Lensing of SDSS Galaxy Clusters I: Measurements*,  
E. Sheldon, D. Johnston, R. Scranton, B. Koester, T. McKay, H. Oyaizu,  
C. Cunha, **M. Lima**, H. Lin, J. Frieman, R. Wechsler, J. Annis, R. Mandelbaum, N. Bahcall, M. Fukugita,  
*ApJ.* **703**, 2217 (2009), arXiv:0709.1153.
8. *A Galaxy Photometric Redshift Catalog for the Sloan Digital Sky Survey Data Release 6*,  
H. Oyaizu, **M. Lima**, C. Cunha, H. Lin, J. Frieman, E. Sheldon,  
*ApJ.* **674**, 768 (2008), arXiv:0708.0030.
7. *The Sixth Data Release of the Sloan Digital Sky Survey*,  
J. Adelman-McCarthy et al.,  
*ApJS.* **175**, 297 (2008), arXiv:0707.3413.
6. *The Fifth Data Release of the Sloan Digital Sky Survey*,  
J. Adelman-McCarthy et al.,  
*ApJS.* **172**, 634 (2007), arXiv:0707.3380.
5. *Self-Calibration of Cluster Dark Energy Studies: Observable-mass Distribution*,  
**M. Lima**, W. Hu,  
*Phys. Rev. D* **72**, 043006 (2005), astro-ph/0503363.
4. *Self-Calibration of Cluster Dark Energy Studies: Counts in Cells*,  
**M. Lima**, W. Hu,  
*Phys. Rev. D* **70**, 043504 (2004), astro-ph/0401559.
3. *Comment on “Dynamical foundations of Nonextensive Statistical Mechanics” by C. Beck*,  
F. Oliveira, R. Morgado, **M. Lima**, B. Mello, A. Hansen, G. Batrouni,  
*Phys. Rev. Lett.* **90**, 218901 (2003).

2. *The Fluctuation-Dissipation Theorem Fails for Fast Superdiffusion*,  
I. Costa, R. Morgado, **M. Lima**, F. Oliveira,  
*Europhys. Lett.* **63**, 173 (2003), cond-mat/0304285.
1. *Morphology of Growth by Random Walk Deposition*,  
J. Cordeiro, **M. Lima**, R. Dias, F. Oliveira,  
*Physica A* **295**, 209 (2001).

TALKS

20. *Aspects of Cosmic Acceleration and the DES*,  
May 2011, Rio de Janeiro-RJ, Brazil  
Seminar at "Theory day" at ON.
19. *Aceleração Cósmica: Teoria e Fenomenologia*,  
November 2010, São Paulo-SP, Brasil  
Seminar at the IF at USP.
18. *A Era da Cosmologia de Precisão: Aceleração Cósmica*,  
October 2010, Sao Paulo-SP, Brasil  
Convite à Física at USP.
17. *Aceleração Cósmica: Teoria e Fenomenologia*,  
September 2010, Rio de Janeiro-RJ, Brasil  
Invited Seminar at CBPF.
16. *Magnification Effects: Submillimeter Galaxies and SZ Clusters*,  
April 2010, Princeton-NJ,  
ACT Collaboration Meeting at Princeton University.
15. *Lensing Magnification Effects: Galaxy Counts and SZ Clusters*,  
March 2010, Philadelphia-PA, EUA  
Seminar at U. Penn.
14. *Non-linear Structure in  $f(R)$  Gravity: N-body Simulations*,  
December 2009, Philadelphia-PA,  
Invited Seminar at Inaugural Workshop of the Center for Particle Cos-  
mology at U. Penn.
13. *N-body Simulations of  $f(R)$  Gravity*,  
June 2009, Aspen-CO,  
Seminar at the Aspen Center for Physics.
12. *N-body Simulations of  $f(R)$  Gravity:  
Power Spectrum and Halo Properties*,  
June 2009, Sao Paulo-SP, Brazil,  
Invited Seminar at the IF at USP.
11. *Lensing Magnification Effects on SZ Clusters*,  
May 2009, Rio de Janeiro-RJ, Brazil,  
DES Collaboration Meeting at CBPF and ON.
10. *Non-linear Structure in  $f(R)$  Gravity:  
Power Spectrum and Halo Statistics*,

December 2008, Philadelphia-PA,  
Seminar at U. Penn.

9. *Non-linear Structure in  $f(R)$  Models of Modified Gravity*,  
July 2008, Chicago-IL,  
Ph.D. thesis defense at U. of Chicago.
8. *Cluster Cosmology and Redshift Estimates in Dark Energy Experiments*,  
February 2008, Batavia-IL,  
Invited Seminar at Fermilab.
7. *Towards Better Cluster Photo-zs for DES and SDSS*,  
December 2006, Chicago-IL,  
DES Collaboration Meeting at the U. of Chicago.
6. *Photometric Redshifts for Dark Energy Experiments*,  
September 2006, Chicago-IL,  
DOE site visit at the U. of Chicago.
5. *Photometric Redshift Requirements for Self-Calibration of Cluster Dark Energy Studies*,  
May 2006, Barcelona, Spain,  
DES Collaboration Meeting at IFAE and IEEC.
4. *Photo-z's: Methods, Errors and CatSim1*,  
October 2005, Ann Arbor-MI,  
DES Collaboration Meeting at the U. of Michigan.
3. *Photometric Redshifts: How well we can do, how well we can know*,  
May 2005, Batavia-IL,  
DES Collaboration Meeting at Fermilab.
2. *Photometric Redshifts for the DES*,  
March 2005, Urbana-Champaign-IL,  
DES Collaboration Meeting at the U. of Illinois.
1. *Violação da Lei de Family-Vicsek em um Sistema com Quebra de Simetria Espacial*,  
August 2002, Brasília-DF, Brazil,  
M.S. dissertation defense at U. of Brasília.

#### POSTERS

5. *Growth with Tunneling*,  
August 2001, Brasilia-DF, Brazil,  
Presentation at the "School on Computational Physics" at the International Center of Condensed Matter Physics at UnB.
4. *Estudo de Crescimento em Caminhos Aleatórios*,  
August 2001, Brasilia-DF, Brazil,  
Presentation at the "7º Congresso de Iniciação Científica" at UnB.

3. *Growth with Tunneling*,  
May 2001, São Lourenço-MG, Brazil,  
Presentation at the "XXIV Encontro Nacional de Física da Matéria Condensada" .
2. *Fractais em Problemas de Crescimento*,  
July 2000, Brasília-DF, Brazil,  
Presentation at the "6º Congresso de Iniciação Científica" at UnB.
1. *Fractais em Caminhos Aleatórios*,  
July 2000, Brasília-DF, Brazil,  
Presentation at the "6º Congresso de Iniciação Científica" at UnB.

EVENTS  
ORGANIZED

1. *ACT-PIRE Summer School: Weak Lensing of Galaxies and the CMB*,  
University of Pennsylvania, Philadelphia-PA. July 2009.

PARTICIPATION  
IN EVENTS

24. *Theory Day at ON*,  
ON, Rio de Janeiro-RJ, Brazil. May 2011.
23. *ACT Collaboration Meeting*,  
Princeton University, Princeton-NJ. April 2010.
22. *Second Penn/NYU Meeting at the Center for Particle Cosmology*,  
University of Pennsylvania, Philadelphia-PA, EUA. March 2010.
21. *Inaugural Workshop of the Center for Particle Cosmology: New Horizons in Particle Cosmology*,  
University of Pennsylvania, Philadelphia-PA. December 2009.
20. *Aspen Workshops: Wide Surveys and Modified Gravity*,  
Aspen Center for Physics, Aspen-CO. June 2009.
19. *DES Collaboration Meeting*,  
CBPF and ON, Rio de Janeiro-RJ. May 2009.
18. *Mapping the Universe from the Big Bang to Present*,  
KICP, Chicago-IL. December 2007.
17. *Santa Fe Cosmology Summer Workshop*,  
Saint John's College, Santa Fe-NM. July 2007.
16. *DES Collaboration Meeting*,  
University of Chicago, Chicago-IL. December 2006.
15. *Santa Fe Cosmology Summer Workshop*,  
Saint John's College, Santa Fe-NM. July 2006.
14. *DES Collaboration Meeting*,  
IFAE and IECC, Barcelona, Spain. May 2006.
13. *DES Collaboration Meeting*,  
University of Michigan, Ann Arbor-MI. October 2005.

12. *Advanced Lectures: A Pan-Chromatic View of Clusters of Galaxies and Large-Scale Structure*,  
 INAOE, Tonanzintla, Mexico. June 2005.
11. *DES Collaboration Meeting*,  
 Fermilab, Batavia-IL. May 2005.
10. *DES Collaboration Meeting*,  
 University of Illinois, Urbana-Champaign-IL. March 2005.
9. *Fundamental Physics from Clusters of Galaxies*,  
 Fermilab, Batavia-IL. December 2004.
8. *School on Fundamentals and Perspectives of Non-Linear Dynamics*,  
 International Center for Condensed Matter Physics, Brasilia, Brazil.  
 July 2002.
7. *Escola Brasileira de Mecânica Estatística*,  
 University of São Paulo, São Carlos-SP. February 2002.
6. *7º Congresso de Iniciação Científica da UnB*,  
 University of Brasilia, Brasilia, Brazil. August 2001.
5. *Workshop on High Magnetoresistance Materials*,  
 International Center for Condensed Matter Physics, Brasilia, Brazil.  
 November 2001.
4. *Encontro Nacional de Física da Matéria Condensada*,  
 São Lourenço-MG, Brasil, May 2001.
3. *6º Congresso de Iniciação Científica da UnB*,  
 University of Brasilia, Brasilia, Brazil. July 2000.
2. *International Workshop on Magnetic Fluids*,  
 International Center for Condensed Matter Physics, Brasilia, Brazil.  
 September 2000.
1. *Retrospectiva e Perspectivas de Ensino, Pesquisa e Fomento*,  
 University of Brasilia, Brasilia-DF. November 1999.



REFERENCES

**Prof. Wayne Hu,**  
Dept. of Astronomy and Astrophysics,  
Kavli Institute for Cosmological Physics,  
University of Chicago, Chicago-IL, 60637  
(773) 702-0160, [whu@background.uchicago.edu](mailto:whu@background.uchicago.edu)

**Prof. Joshua Frieman**  
Dept. of Astronomy & Astrophysics,  
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&  
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**Dr. Huan Lin,**  
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Fermi National Accelerator Laboratory, Batavia-IL, USA  
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