

# Andisheh Mahdavi

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## RESEARCH INTERESTS

*The Composition of the Largest Structures in the Universe.* Plasma and dark matter physics in groups and clusters of galaxies from X-ray, optical, and radio data. Joint analysis of stellar dynamical, hydrodynamical, gravitational lensing, and Sunyaev-Zel'dovich mass estimators. Analysis of supercomputer simulations of the cosmos.

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## POSITIONS

*San Francisco State University*, San Francisco, CA, 2008- Assistant Professor of Physics and Astronomy.

*University of Victoria*, Victoria, B.C., 2005-2008 Postdoctoral Fellow.

*University of Hawaii*, Honolulu, HI, 2001-2005 Postdoctoral Fellow.

*Harvard University*, Cambridge, MA 1996-2001 Graduate student researcher.

*Max-Planck-Institut für Extraterrestrische Physik*, Garching, Germany 1995-96 Fulbright Scholar.

*Harvard University*, Cambridge, MA 1993-95, Undergraduate researcher.

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## EDUCATION

*Harvard University*, Ph.D. in Astronomy and Astrophysics, November 2001.  
Supervisor: Dr. Margaret Geller

*Harvard University*, B. A. *magna cum laude* in Astronomy and Astrophysics, June 1995.

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## PRIZES

*Chandra Postdoctoral Fellowship*, 2001-2004

*National Science Foundation Graduate Fellowship*, 1996-1999

*Harvard CUE Excellence in Teaching Award*, 1997

*United States Fulbright Grant*, 1995-96

*Goldberg Prize*, 1995, for best Astronomy senior thesis

*Hoopes Prize*, 1995, college-wide award for outstanding thesis

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## STUDENT SUPERVISION

*Weihan Chang*, "Combining X-ray and SZ Observations of Non-relaxed Galaxy Clusters," Fall 2009-

*Tun Win*, "X-ray mass profiles for nearby massive clusters of galaxies," Summer 2009-

*Michelle Krok*, "The Mass-concentration relation from X-ray and weak lensing data," Fall 2008-

*Alison Mansheim*, "A dynamical code for the Joint Analysis of Cluster Observations,"  
Master's Thesis, Fall 2008-Spring 2009  
*Thomas Bills*, "A uniform pipeline for multi-mission X-ray spectroscopy," Fall 2008  
*Tyler Johnson*, University of Victoria "Measurements of the CFHT Megacam PSF at  
> 1''", Spring 2008  
*Adam Draginda*, University of Victoria, "Optical luminosity functions of galaxy groups,"  
Spring 2006

## **TEACHING**

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*San Francisco State University*, Physics 725, Special and General Relativity, Fall 2009  
*San Francisco State University*, Astronomy 115, Introduction to Astronomy, Spring  
2009  
*University of Victoria*, Guest lecturer, Astronomy 505, Galaxies, 2006-2008  
*University of Victoria*, Guest lecturer, Astronomy 303, Introduction to Extragalactic  
Astronomy, 2006-2007  
*University of Victoria*, Guest lecturer, Astronomy 511, Galactic Dynamics, Spring 2006  
*University of Hawaii*, Graduate student telescope instructor, 2002  
*Harvard University*, Teaching Fellow, Science A-35 and Astronomy 14, 1996-99

## **TELESCOPE TIME (PAST TWO YEARS)**

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*CFHT*, Col, 12 nights, 2007-2009  
*GMRT*, PI, 24 hours, 2009  
*Chandra*, Col, 500ks, 2008  
*Gemini North & South*, PI & Col, GMOS, 2008-  
*Hubble Space Telescope*, Col, 18 orbits, 2008  
*Keck*, Col, DEIMOS 2008  
*XMM-Newton*, Col (60ks, 2007)

## **INVITED TALKS (PAST TWO YEARS)**

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*University of Hawaii*, "Do Real Galaxy Cluster Dark Matter Halos Resemble Those in  
N-body Simulations? 8/09  
*SF State Mathematics Department*, "Cosmic Origins: How Dark Forces Gave Rise to  
Stars, Planets, and Carbon-based Life, 4/09 (non-technical talk)  
*SF Amateur Astronomers*, "Cosmic Origins: How Dark Forces Gave Rise to Stars,  
Planets, and Carbon-based Life, 4/09 (non-technical talk)  
*UC Davis*, "Multiwavelength Observations of Galaxy Clusters," 1/09  
*UC Berkeley*, "Dark and Luminous Matter in Clusters of Galaxies," 9/08  
*DUEL Gravitational Lensing Workshop*, "Joint Analysis of Cluster Observations," 7/08  
*Herzberg Institute for Astrophysics*, "Measuring the Masses of Dark Matter Dominated  
Objects," 6/08  
*Kavli Institute for Cosmological Physics*, "Dark and Luminous Matter in Clusters of  
Galaxies," 6/08

*Kavli Institute for Cosmological Physics*, "A Basis for Multiwavelength Cluster Science," 6/08

*Royal Astronomical Society of Victoria*, "Dark and Luminous Matter in Clusters of Galaxies," 5/08

*University of Alberta*, "Dark and Luminous Matter in Clusters of Galaxies," 3/08

*San Francisco State University*, "Dark and Luminous Matter in Clusters of Galaxies," 2/08

*University of Hawaii*, "Physics of Relaxed and Merging Clusters of Galaxies," 1/08

*Canada-France-Hawaii Telescope*, "The Canadian Cluster Comparison Project," 12/07

*University of Victoria*, "Physics of Relaxed and Merging Clusters of Galaxies," 11/07

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## PROFESSIONAL SERVICE

*Peer Review*, Chandra, Suzaku

*Constellation-X/IXO*, Facility Science Team Panel Member

*Journal Referee*, *Astrophysical Journal*, 1999-, *Monthly Notices*, 2005-, *Astronomy & Astrophysics*, 2006-

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## COMPUTING

*Languages*. Excellent knowledge of C, FORTRAN, Mathematica, IDL, IRAF, Linux, Mac OS, Shell Scripting, Parallel Computing (MPI/OpenMP)

*Publicly released software*. Hrothgar Parallel Minimizer,

<http://hrothgar.sourceforge.net>

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## PERSONAL

*Citizenship*. USA

*Background*. Born 1973 in Iran. Grew up in Italy and the US.

*Languages*. Fluent in English and German. Conversant in Italian and Farsi. Working knowledge of French.

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## REFEREED PUBLICATIONS

1. Cattaneo, A., Faber, S. M., Binney, J., Dekel, A., Kormendy, J., Mushotzky, R., Babul, A., Best, P. N., Brügggen, M., Fabian, A. C., Frenk, C. S., Khalatyan, A., Netzer, H., **Mahdavi**, A., Silk, J., Steinmetz, M., Wisotzki, L., "The role of black holes in galaxy formation and evolution," *Nature*, 460, 213 (2009)
2. Ngan, W. W., Van Waerbeke, L., **Mahdavi**, Heymans, C., & Hoekstra, H., "Sérsiclets - A Matched Filter Generalisation of Shapelets for Weak Lensing Studies," *Monthly Notices of the Royal Astronomical Society*, 396, 1211 (2009)
3. Henry, J. P., Evrard, A. E., Hoekstra, H., Babul, A., & **Mahdavi**, A., "The X-ray Cluster Normalization of the Matter Power Spectrum," *The Astrophysical Journal*, 691, 1307 (2009)
4. Bildfell, C., Hoekstra, H., Babul, A., & **Mahdavi**, A., "Resurrecting the Red From the Dead: Optical Properties of BCGs in X-ray Luminous Clusters," *Monthly Notices of the Royal Astronomical Society*, 389, 1637 (2008)

5. Matheson, T. et al, "Optical Spectroscopy of Type Ia Supernovae," *The Astronomical Journal*, 135, 1598 (2008)
6. **Mahdavi**, A., Hoekstra, H., Babul, A., & Henry, J. P., "Evidence for Non-Hydrostatic Gas from the Cluster X-ray to Lensing Mass Ratio," *Monthly Notices of the Royal Astrophysical Society*, 384, 1567 (2008)
7. **Mahdavi**, A., Hoekstra, H., Babul, A., Balam, D., & Capak, P., "A Dark Core in Abell 520," *The Astrophysical Journal*, 668, 806 (2007)
8. Poole, G., Babul, A., McCarthy, I. G., Fardal, M. A., Bildfell, C. J., Quinn, T., & **Mahdavi**, A., "The Impact of Mergers on Relaxed X-ray Clusters - II. Effects on Global X-ray and Sunyaev-Zel'dovich Properties and Their Scaling Relations," *Monthly Notices*, 380, 437 (2007)
9. **Mahdavi**, A., Hoekstra, H., Babul, A., Sievers, J., Myers, S. T., and Henry, J. P., "Joint Analysis of Cluster Observations: I. Mass Profile of Abell 478 from X-ray, Weak Lensing, and Sunyaev-Zel'dovich Observations," *The Astrophysical Journal*, 664, 162 (2007)
10. Trentham, N., Tully, R. B., & **Mahdavi**, A., "Dwarf Galaxies in the Dynamically Evolved NGC 1407 Group," *Monthly Notices*, 369, 1375 (2006)
11. Jha, S. et al., "UBVRI Light Curves of 44 Type Ia Supernovae," *The Astronomical Journal*, 131, 527 (2006)
12. **Mahdavi**, A., Trentham, N., & Tully, R. B., "The NGC 5846 Group: Dynamics and the Luminosity Function to  $M_R = -12$ ," *The Astronomical Journal*. 130, 1502 (2005)
13. **Mahdavi**, A., Finoguenov, A., Böhringer, H., Geller, M. J., & Henry, J. P., "XMM-Newton and Gemini Observations of Eight RASSCALs Galaxy Groups," *The Astrophysical Journal*. 622, 187 (2005)
14. Ramella, M., Boschin, W., Geller, M. J., **Mahdavi**, A., & Rines, K., "K-band Properties of Well-Samples Groups of Galaxies," *The Astronomical Journal*, 128, 2022 (2004)
15. **Mahdavi**, A. and Geller, M. J., "A New Redshift Survey of Galaxies in Groups: the Shape of the Mass Density Profile," *The Astrophysical Journal*, 607, 202-219 (2004)
16. Rines, K., Geller, M. J., Diaferio, A., **Mahdavi**, A., Mohr, J. J. & Wegner, G., "Mass Profile of the Infall Region of the Abell 2199 Supercluster," *The Astronomical Journal*, 124, 1266 (2002)
17. Torres, M. A. P., Callanan, P. J., Garica, M. R., McClintock, J. E., Garnavich, P., Balog, Z., Berlind, P., Brown, W. R., Calkins, M., **Mahdavi**, A., "Optical Spectral Monitoring of XTE J1118+48 in Outburst: Evidence for a Precessing Accretion Disk?" (2002) *The Astrophysical Journal*, 569, 423 (2002)

18. Leonard, D. C., Filippenko, A. V., Li, W., Matheson, T., Kirshner, R. P., Chornock, R., van Dyk, S. D., Berlind, P., Calkins, M. L., Challis, P. M., Garnavich, P. M., Jha, S., **Mahdavi**, A., "A Study of the Type II-plateau Supernova 1999gi," *The Astronomical Journal*, 124, 2490 (2002)
19. Rines, K., **Mahdavi**, A., Geller, M. J., Diaferio, A., Mohr, J. J., & Wegner, G., "X-Ray Emitting Groups in the Infall Region of Abell 2199", *The Astrophysical Journal*, 555, 558 (2001)
20. **Mahdavi**, A. & Geller, M. J., "The  $L_X - \sigma$  Relation for Galaxies and Clusters of Galaxies," *The Astrophysical Journal*, 554, 129 (2001)
21. **Mahdavi**, A., "The Orbital Structure of Dark Matter Halos with Gas," *The Astrophysical Journal*, 546, 812 (2001)
22. **Mahdavi**, A., Böhringer, H., Geller, M. J., & Ramella, M., "The RASSCALs: An X-ray and Optical Study of 260 Galaxy Groups," *The Astrophysical Journal*, 534, 114 (2000)
23. **Mahdavi**, A., "The Cluster  $L_X - \sigma$  Relation Has Implications for Scale-Free Cosmologies," *The Astrophysical Journal Letters*, 520, 17 (1999)
24. **Mahdavi**, A., Geller, M. J., Böhringer, H., Kurtz, M. J., & Ramella, M., "The Dynamics of Poor Systems of Galaxies," *The Astrophysical Journal*, 518, 69 (1999)
25. **Mahdavi**, A., & Kenyon, S., "The Bright Accretion Rings on Magnetic T Tauri Stars," *The Astrophysical Journal*, 497, 342 (1998)
26. **Mahdavi**, A., Böhringer, H., Geller, M. J., & Ramella, M., "X-Ray Emission from Optically Selected Galaxy Groups," *The Astrophysical Journal*, 483, 68 (1997)
27. **Mahdavi**, A., Geller, M. J., Fabricant, D. G., Kurtz, M. J., Postman, M., & McLean, B., "The Lumpy Cluster Abell 1185," *The Astronomical Journal*, 111, 64 (1996).