

**AMALIA K. HICKS**

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**Education**

**University of Colorado**, Boulder, Colorado  
Doctor of Philosophy: December 2005  
Major: Astrophysics  
Advisor: Dr. Erica Ellingson

**Massachusetts Institute of Technology**, Cambridge, Massachusetts  
Master of Science: February 2001  
Major: Physics  
Advisor: Dr. Claude Canizares

**University of Wisconsin**, Milwaukee, Wisconsin  
Bachelor of Science: August 1997  
Major: Physics  
Advisor: Dr. Marija Josifovska

**Macalester College**, St. Paul, Minnesota  
Bachelor of Arts: May 1994  
Major: English Literature/Creative Writing  
Advisor: Dr. Alvin Greenberg

**Academic  
Honors**

NASA Postdoctoral Program (NPP) Fellowship offer, 2008  
McGill Postdoctoral Fellowship offer, 2008  
Graduate Student Research Program Fellowship (NASA), Scientific  
Advisor: Dr. Richard Mushotzky, September 2002 - August 2005  
American Astronomical Society International Travel Grant, March 2004  
Women's Forum of Colorado Foundation Scholarship, Fall 2001  
Advanced Analysis Facility Internship, summer 1997  
Dean's Honor List, spring 1997  
Dean's Honor List, fall 1996  
James Martin Scholarship, spring 1996  
Dewitt Wallace Distinguished Scholar Award, 1990-1994  
Taylor Grant, summer 1993

**Research  
Experience**

**Postdoctoral Research Assistant to M. Donahue and M. Voit**, Department of Physics and Astronomy, Michigan State University, East Lansing, MI, 2008-

**Postdoctoral Research Assistant to C. Sarazin**, Department of Astronomy, University of Virginia, Charlottesville, VA, 2005-2008.

**Research Assistant**, Center for Astrophysics and Space Research (CASA), University of Colorado, Boulder, CO, 2001-2005.

**Data Analyst**, Center for Space Research/CXC, Massachusetts Institute of Technology (MIT), Boston, MA, 2001.

**Research Assistant**, Center for Space Research (CSR), Massachusetts Institute of Technology, Boston, MA, 1998-2001.

**Research Assistant**, Laboratory for Nuclear Science, Massachusetts Institute of Technology, Boston, MA, 1997 - 1998.

**Research Intern**, Advanced Analysis Facility, University of Wisconsin, Milwaukee, WI, Jun 1997.

**Research Participation**, Physics Department, University of Wisconsin, Milwaukee, WI, 1996 - 1997.

**Research Participation**, Chemistry Department, Macalester College, St. Paul, MN, 1993 - 1994.

**Pediatric Intern** (funded by Taylor Grant), Milwaukee, WI, 1993.

**Teaching/  
Education/  
Outreach**

**NASA Center for Astronomy Education Workshop attendant**, American Astronomical Society 211<sup>th</sup> Meeting, Austin, TX, January 6-7 2008

**Instructor, ASTR348: Introduction to Cosmology**, Department of Astronomy, University of Virginia, Charlottesville, VA, Summer 2007

**Tutor for Student Athletes**, University of Virginia, Charlottesville, VA, Spring 2007

**Lecturer at public open houses**, McCormick Observatory, University of Virginia, Charlottesville, VA, 2005-2007.

**Substitute instructor for graduate High Energy Astronomy course**, Department of Astronomy, University of Virginia, Charlottesville, VA, Fall 2006

**Undergraduate Astronomy senior honors thesis participation**, Department of Astronomy, University of Virginia, Charlottesville, VA, 2005-2006

**Substitute instructor for undergraduate Astronomy majors' course**, Department of Astronomy, University of Virginia, Charlottesville, VA, Fall 2005

**Undergraduate Astronomy research project advisor**, Department of Astrophysical and Planetary Science, University of Colorado (CU), Boulder, CO, 2005.

**Quantum Mechanics instructor for GRE review classes**, Department of Astrophysical and Planetary Science, CU, Boulder, CO, 2003.

**Undergraduate Physics senior honors thesis advisor**, Department of Astrophysical and Planetary Science, CU, Boulder, CO, 2003-2005.

**Public open house volunteer**, Sommers Bausch Observatory, University of Colorado, Boulder, CO, 2001-2003.

**Recitation instructor**, Physics Department, University of Wisconsin, Milwaukee, WI, 1997.

**Presentations/ Conferences** University of Virginia, invited astronomy colloquium, April 2008

University of Pittsburgh, invited physics colloquium, January 2008

University of Pittsburgh, invited astronomy lunch talk, January 2008

211<sup>th</sup> Meeting of the American Astronomical Society (AAS), poster presentation  
Austin, Texas, January 7-11, 2008

Boston University, invited astronomy colloquium, November 2007

X-ray Surveys: Evolution of Accretion, Star-formation and Large Scale Structure, oral presentation, Rodos Island, Greece, July 2-6, 2007.

Macalester College, invited physics colloquium, February 2007

26<sup>th</sup> General Assembly of the International Astronomical Union (IAU), poster presentation, Prague, Czech Republic, August 14-25, 2006.

University of Wisconsin-Madison, astronomy lunch talk, Fall 2005

205<sup>th</sup> Meeting of the American Astronomical Society (AAS), oral presentation (thesis talk), San Diego, California, January 9-13, 2005.

35<sup>th</sup> COSPAR Scientific Assembly, Session E.1.2 - Clusters of Galaxies: New Insights from XMM-Newton, *Chandra*, and INTEGRAL, oral presentation, Paris, France, July 18-25, 2004.

204<sup>th</sup> Meeting of the American Astronomical Society (AAS), oral presentation, Denver, Colorado, May 30 – June 4, 2004.

“Multiwavelength Cosmology”, poster presentation, Mykonos, Greece, June 17-20, 2003.

200<sup>th</sup> Meeting of the American Astronomical Society (AAS), poster presentation, Albuquerque, New Mexico, June 2-6, 2002.

Meeting of the High Energy Astrophysics Division (HEAD) of the AAS, poster presentation, Honolulu, Hawaii, November 6-10, 2000.

30<sup>th</sup> Saas Fee Advanced Course: “High-Energy Spectroscopic Astrophysics”, Les Diablerets, Switzerland, April 3-8, 2000.

“Large Scale Structure in the X-ray Universe”, poster presentation, Santorini, Greece, September 20-22, 1999.

## Accepted Proposals

Chandra, CXC, Cycle 10 *Deciphering Cluster Observables: Tracing the Baryons in Clusters of Galaxies*, 2008, 144,000 seconds, awaiting budget, PI.

Suzaku, Cycle 3 *Cosmology with Clusters: Constraining Physical Differences Between X-ray and Optically Selected Samples at Moderate-z*, 2008, 297,000 seconds, awaiting budget, PI.

Suzaku, Cycle 2 *A Suzaku Snapshot Survey of High-redshift Galaxy Clusters from the RCS Survey*, 2007, 33,000 seconds, \$19,667, PI.

GALEX, Cycle 3 *Measuring Star Formation Rates in Clusters of Galaxies With GALEX*, 2006, 46,500 seconds, 31 orbits, \$83,999, PI.

Chandra, CXC, Cycle 8 *Solving the Cooling Flow Mystery: Understanding Variations in Star Formation Efficiency Using the Chandra Archive*, 2006, archival proposal, \$65,000, PI.

Chandra, CXC, Cycle 8 *The Halo Structure of RCS2-2327.4-0204*, 2006, 25,000 seconds, \$22,999, Co-I.

Hubble Space Telescope, Cycle 15 *The Halo Structure of RCS2-2327.4-0204*, 2006, 22 orbits, \$77,653, Co-I.

XMM-Newton, ESA, Cycle 5 *Diagnostics and Effects of the Outburst in Hercules-A*, 2005, 100,000 seconds, \$46,419, Co-I.

XMM-Newton, ESA, Cycle 5 *Mass Constraints on High Redshift Clusters of Galaxies with XMM-Newton*, 2005, 15,000 seconds, \$55,418, PI.

Suzaku, Cycle 1 *Nailing Down the Hard X-ray Inverse Compton Emission from the Radio Halo in the Coma Cluster*, 2005, 180,000 seconds, \$51,401, Co-I

Suzaku, Cycle 1 *Hard X-ray Inverse Compton Emission and a Merger Shock Associated with the Brightest Known Radio Relic in Abell 3667*, 2005, 135,000 seconds, \$42,560, Co-I.

**Recently Submitted**

Chandra, Cycle 10 *"Deciphering Cluster Observables: Tracing the Baryons in Clusters of Galaxies"*, 2008, 275,000 seconds, PI.

**Committees**

**Concerns Committee**, Department of Astrophysical and Planetary Science, University of Colorado, Boulder, CO, Academic Year (AY) 2004 - 2005.

**Faculty Search Committee**, Department of Astrophysical and Planetary Science (APS), University of Colorado, Boulder, CO, Spring 2004.

**Faculty Meeting Student Representative**, Department of Astrophysical and Planetary Science, University of Colorado, Boulder, CO, AY 2003 - 2004.

**Admissions Committee**, Department of Astrophysical and Planetary Science, University of Colorado, Boulder, CO, Spring 2003.

**Faculty Search Committee**, Department of Astrophysical and Planetary Science, University of Colorado, Boulder, CO, Spring 2003.

**Faculty Meeting Student Representative**, Department of Astrophysical and Planetary Science, University of Colorado, Boulder, CO, AY 2002 - 2003.

**Student Representative**, Dance Department, Macalester College, St. Paul, MN, AY 1991-1992.

**Student Representative**, Dance Department, Macalester College, St. Paul, MN, AY 1990-1991.

## **Professional Societies**

*Membership application pending, **International Astronomical Union (IAU)**, 2007.*

*Member, **High Energy Astrophysics Division (HEAD) of the AAS**, 2007 –*

*Associate member, **Comittee on Space Research (COSPAR)**, 2005 -*

*Member, **American Astronomical Society (AAS)**, 2005 –*

*Junior Member, **American Astronomical Society**, 2002 – 2005.*

## **Additional Activities**

*Member, **Women in Physics**, Massachusetts Institute of Technology, Boston, MA, 1997 - 2001.*

*Member, **Journal Club**, Massachusetts Institute of Technology, Boston, MA, 1998 - 2001.*

*Vice President, **Physics Club**, University of Wisconsin, Milwaukee, WI, 1995 - 1997.*

*Member, **Society of Physics Students**, University of Wisconsin, Milwaukee, WI, 1995 - 1997.*

*Member, **Women's Collective**, Macalester College, St. Paul, MN, 1990 – 1994.*

*Choir Member, **American Music Ensemble** (Gospel Choir), Macalester College, St. Paul, MN, 1993.*

*Member, **Women in Science**, Macalester College, St. Paul, MN, 1992 – 1994.*

*Cast Member, **Spring Play**, Macalester College, St. Paul, MN, 1991.*

*Treasurer, **Mac Peace & Justice**, Macalester College, St. Paul, MN, 1991.*

*Member, **Occasional Improv**, Macalester College, St. Paul, MN, 1990 – 1991.*

*Volunteer, **Habitat for Humanity**, Macalester College, St. Paul, MN, 1990 - 1991.*

*Volunteer, **Little Earth Native American Housing**, Macalester College, St. Paul, MN, 1990-1991.*

## Publications<sup>\*</sup>

- “A  $z=0.9$  Supercluster of X-Ray Luminous, Optically-Selected, Massive Galaxy Clusters”, Gilbank, D. G., Yee, H. K. C., Ellingson, E., **Hicks, A. K.**, Gladders, M. D., Barrientos, L. F., and Keeney, B., 2008, *Astrophysical Journal Letters*, accepted
- “*Chandra* X-ray Observations of the  $0.6 < z < 1.1$  Red-Sequence Cluster Survey Sample”, **Hicks, A. K.**, Ellingson, E., Bautz, M., Cain, B., Garmire, G., Gilbank, D., Gladders, M., Hoekstra, H., & Yee, H. K. C. 2008, *Astrophysical Journal*, 680, 1022
- “Evidence for Line-of-sight Structure in a Comparison of X-ray and Optical Observations of the High-redshift Cluster RCS043938-2904.7”, Cain, B., Gilbank, D., Bautz, M. W., **Hicks, A. K.**, Yee, H. K., Gladders, M., Ellingson, E., Barrientos, L. F., & Garmire, G.P., 2008, *Astrophysical Journal*, 679, 293
- “A Multiwavelength Analysis of the Strong Lensing Cluster RCS0224334-0002.5 at  $z=0.778$ ”, **Hicks, A. K.**, Ellingson, E., Hoekstra, H., Gladders, M., Yee, H. K. C., Bautz, M., Gilbank, D., Webb, T., & Ivison, R. 2007, *Astrophysical Journal*, 671, 1446
- “*Chandra* Observation of the Interaction of the Radio Source and Cooling Core in Abell 2063”, Kanov, K. N., Sarazin, C L. & **Hicks, A. K.** 2006, *Astrophysical Journal*, 653, 184
- “Multiwavelength Mass Comparisons of the  $z \sim 0.3$  CNOC Cluster Sample”, **Hicks, A. K.**, Ellingson, E., Hoekstra, H., & Yee, H. K. C. 2006, *Astrophysical Journal*, 652, 232
- “Star Formation Rates in Cooling Flow Clusters: A UV Pilot Study with Archival XMM Newton Optical Monitor Data”, **Hicks, A. K.**, & Mushotzky, R. 2005, *Astrophysical Journal Letters*, 635, L9
- “Multiwavelength Studies of Cluster Evolution from  $z \sim 1$  to the Present”, **Hicks, A. K.** 2005, Doctoral Dissertation, University of Colorado-Boulder
- \* “*Chandra* Observations of  $z \sim 1$  Clusters from the Red Sequence Cluster Survey”, **Hicks, A. K.** 2004, *Bulletin American Astronomical Society*, 36
- “*Chandra* X-ray Observations of Newly Discovered,  $z \sim 1$  Clusters from the Red Sequence Cluster Survey”, **Hicks, A. K.**, Ellingson, E., Bautz, M. W., Yee, H. K. C., Gladders, M., & Garmire, G. 2004, *Advances in Space Research*, 36, 706
- \* “Unresolved X-ray Sources in Intermediate Redshift Cluster Fields”, Fawcett, S., Ellingson, E., & **Hicks, A. K.** 2004, *Bulletin American Astronomical Society*, 36

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\* Not refereed

- \* “Star Formation Rates in Cooling Flow Clusters”, Mushotzky, R., & **Hicks, A. K.** 2004, *Bulletin American Astronomical Society*, 36
- \* “First X-ray Results from the Optically Selected Red Sequence Cluster Survey (RCS) at  $z \sim 1$ ”, **Hicks, A. K.**, Ellingson, E., Yee, H. K. C., Jeltema, T. E., Bautz, M. W., Gladders, M., & Garmire, G. 2004, in *Multiwavelength Cosmology*, ed. M. Plionis, Kluwer Academic Publishers
- “Linear Gas Dynamics in the Expanding Universe”, Gnedin, N. Y., Baker, E. J., Bethell, T. J., Drosback, M. M., Harford, A. G., **Hicks, A. K.**, Jensen, A. G., Keeney, B. A., Kelso, C. M., Neyrinck, M. C., Pollock, S. E. & van Vliet, T. P. 2003, *Astrophysical Journal*, 583, 525
- \* “Mass Distribution in Clusters of Galaxies: X-Ray and Lensing Comparisons of 3 Intermediate-Redshift CNOG Clusters”, **Hicks, A. K.** 2002, *Bulletin American Astronomical Society*, 34, 706
- “Chandra X-Ray Spectroscopy and Imaging of the Galaxy Cluster PKS 0745-191”, **Hicks, A. K.**, Wise, M. W., Houck, J. C., & Canizares, C. R. 2002, *Astrophysical Journal*, 580, 763
- “Chandra X-Ray Spectroscopy and Imaging of the Galaxy Cluster PKS 0745-191”, **Hicks, A. K.** 2001, Masters Thesis, Massachusetts Institute of Technology (MIT)
- “Effects of Departures from Ionization Equilibrium on Cooling Flow X-Ray Spectra”, **Hicks, A. K.**, & Canizares, C. R. 2001, *Astrophysical Journal*, 556, 468
- \* “A Comparison of X-ray and Gravitational Lensing Mass Estimates Using *Chandra* Observations of PKS 0745-191”, **Hicks, A. K.** & Canizares, C. R. 2000, *Bulletin American Astronomical Society*, 32, 1199
- \* “Effects of Departures from Ionization Equilibrium on Cooling Flow X-ray Spectra”, **Hicks, A. K.**, & Canizares, C. R. 1999, in *Large Scale Structure in the X-Ray Universe*, eds. M. Plionis, I Georgantopoulos, S. Basilakos, E. Kontizas, Kluwer Academic Publishers
- “The Effects of High Temperature Annealing on the Surface Reconstruction of Nickel Oxide (1.0)”, Schofield, M. A., **Hicks, A. K.**, & Gajdardziska-Josifovska, M. 1998, *Electron Microscopy 1998, Proc. 14<sup>th</sup> International Congress on Electron Microscopy*, Eds. H.A. Calderon Benavides and M.J. Yacaman, Institute of Physics Publishing, 3, 713

## Selected Current Projects

- “Radio and X-ray Interactions in the Merging Cluster Abell 115”, **Hicks, A. K.**, Heinke, C. O. & Sarazin, C. L. 2008, *Astrophysical Journal*, in prep
- “Star Formation Rates in Cooling Flow Clusters II: Extended Sample”, **Hicks, A. K.**, & Mushotzky, R. 2008, *Astrophysical Journal*, in prep
- “XMM-Newton and Chandra Observations of the Distant Massive Galaxy Cluster RCS 2327-0204”, **Hicks, A. K.**, Bautz, M., Cain, B., Ellingson, E., Garmire, G., Gilbank, D., Gladders, M., Hoekstra, H. & Yee, H. K. C. 2008, *Astrophysical Journal*, in prep
- “Multi-wavelength Observations of the Extremely Massive and High Redshift Cluster RCS2 2327-02”, Gladders, M., Hoekstra, H., Gilbank, D., **Hicks, A. K.**, Marrone, D., Barrientos, L. F., Bonamente, M., Carlstrom, J., Ellingson, E., Joy, M., Yee, H. K. C. (author list and order TBD) 2008, *Astrophysical Journal Letters*, in prep

## References

### Research

#### **Dr. Claude R. Canizares**

Title: Professor, Associate Provost  
Address: MIT, Room 3-234  
77 Massachusetts Ave.  
Cambridge, MA 02139-4307  
Phone: 617-253-3206  
Email: [crc@MIT.EDU](mailto:crc@MIT.EDU)  
Relationship: Graduate advisor

#### **Dr. Erica Ellingson**

Title: Professor  
Address: CASA, Univerisity of Colorado  
389 UCB  
Boulder, CO 80309-0389  
Phone: 303-492-6610  
Email: [Erica.Ellingson@colorado.edu](mailto:Erica.Ellingson@colorado.edu)  
Relationship: Ph.D. advisor

#### **Dr. Richard F. Mushotzky**

Title: Astrophysicist, Adjunct Professor  
Address: Laboratory for High Energy Astrophysics  
Code 662  
Greenbelt, MD 20771  
Phone: 301-286-7579  
Email: [richard@milkyway.gsfc.nasa.gov](mailto:richard@milkyway.gsfc.nasa.gov)  
Relationship: GSRP fellowship scientific advisor

#### **Dr. Craig L. Sarazin**

Title: W. H. Vanderbilt Professor  
Address: Department of Astronomy  
University of Virginia  
P.O. Box 400325  
Charlottesville, VA 22904-4325  
Phone: 434-924-4903  
Email: [cls7i@virginia.edu](mailto:cls7i@virginia.edu)  
Relationship: Postdoctoral employer/advisor

### Teaching

#### **Dr. Edward M. Murphy**

Title: Associate Professor  
Address: Department of Astronomy  
Box 400325  
Charlottesville, VA 22904-4325  
Phone: 434-924-4890  
Email: [emm8x@virginia.edu](mailto:emm8x@virginia.edu)  
Relationship: Colleague

#### **Dr. Robert T. Rood**

Title: Professor  
Address: Department of Astronomy  
Box 400325  
Charlottesville, VA 22904-4325  
Phone: 434-924-4886  
Email: [rtr@virginia.edu](mailto:rtr@virginia.edu)  
Relationship: Colleague