

## RYAN C. HICKOX

Department of Physics  
Durham University  
South Road, Durham DH1 3LE  
United Kingdom

Phone: +44 191 334 3773  
Fax: +44 0191 334 3645  
email: [ryan.hickox@durham.ac.uk](mailto:ryan.hickox@durham.ac.uk)  
<http://www.dur.ac.uk/ryan.hickox/>

### EDUCATION

**Harvard University** – Ph.D. in Astronomy, October 2007, GPA 4.0/4.0

**Yale University** – B.S. in Physics *magna cum laude*, June 2000, GPA 3.85/4.0

### RESEARCH APPOINTMENTS

#### **Durham University**

STFC Postdoctoral Fellow, 2009–present. Interests include active galactic nuclei, large-scale structure, cosmic X-ray background, X-ray binary pulsars, analysis of data from *Chandra*, *XMM-Newton*, *Hubble*, *Spitzer*, and *Herschel* space telescopes.

#### **Smithsonian Astrophysical Observatory**

SAO Postdoctoral Fellow, 2007–2009. Supervisor: Christine Jones. I maintain an affiliation with SAO as a Research Associate.

#### **Department of Astronomy, Harvard University**

Ph.D. Candidate, 2002–2007, NASA GSRP Fellow and Harvard Merit Fellow.

Thesis: “Active Galactic Nuclei and the Unresolved Cosmic X-ray Background”

Advisors: Dr. Christine Jones & Prof. Ramesh Narayan. Thesis defense 17 October 2007;

Ph.D. conferred 4 March 2008

#### **Physics Department, Yale University**

Senior thesis research, 1999–2000. Experimental particle physics (neutral *B* meson oscillation) with data from the CDF detector at Fermilab. Advisor: Prof. Colin Gay

#### **Graduate School of Oceanography, University of Rhode Island**

Researcher, summers 1999–2001 (SURFO Fellow 1999). Studies of ocean circulation using satellite sea surface temperature data. Advisor: Prof. Peter Cornillon

### FELLOWSHIPS AND AWARDS

- STFC Postdoctoral Fellowship (2009–present)
- Einstein Fellowship (2009, declined)
- SAO Postdoctoral Fellowship (2007–2009)
- NASA Graduate Student Researchers Program Fellowship (2005–2007)
- Harvard Merit Fellowship (2006–2007)
- Harvard Certificate of Distinction in Teaching, Fall 2004, Spring 2005, Spring 2006
- American Association of Physics Teachers Outstanding Teaching Assistant Award, Harvard Department of Astronomy, 2004–2005
- Howard L. Schultz Prize for experimental physics, Yale University May 2000
- Summer Undergraduate Research Fellowship, Graduate School of Oceanography, University of Rhode Island, Summer 1999

## TEACHING AND ADVISING

### Physics Tutor, Durham University

Currently leading Level 2 (2nd year) undergraduate tutorials in the Department of Physics, supervising research and writing of essays on a variety of physics-related topics.

### Teaching Fellow, Harvard University

- *Derek Bok Center Fall Teaching Conference*, September 2007  
Led workshop on “Successful Science Sections” for Harvard Teaching Fellows.
- *Science A-35*, “Matter in the Universe”, Prof. R. Kirshner, Spring 2006  
Survey astronomy course in the “Core” (general education) curriculum. Led one weekly section and exam reviews. *Average overall student evaluation score: 5.0/5.0*
- *Astronomy 16*, “Stars and Gas in the Milky Way”, Prof. B. Gaensler, Spring 2005  
Galactic astronomy course for advanced first-year students. Led observing and data analysis sessions, along with weekly review discussion. *Average evaluation score: 4.6/5.0*
- *Science A-47*, “Cosmic Connections”, Prof. L. Hernquist, Fall 2004  
Survey astronomy course in the Core curriculum. Led two weekly sections, along with course-wide exam reviews and one guest lecture. *Average evaluation score: 5.0/5.0*
- *Astronomy 45*, “Introduction to Astrophysics”, Prof. A. Dalgarno, Fall 2003  
Introductory astrophysics course. Led weekly discussion sections and problem set review. *There were no student evaluations for this course.*

### Mentor, SAO Summer Intern Program (2004, 2005, 2006, 2009)

Research mentor for four undergraduate interns, in studies of X-ray pulsars, galaxy clusters, and active galactic nuclei. Research resulted in one published paper (Nielsen, Hickox & Vrtilik 2004, *ApJ Letters*, 616, L135), one submitted paper (Hung, Hickox, Boroson & Vrtilik 2009, *ApJ* submitted), four AAS conference posters, and one *Chandra* symposium poster.

### Undergraduate Supervisor (Spring/Summer 2009)

Supervised two undergraduate students in projects involving development of X-ray stacking software (STACKFAST) and compilation and interpretation of multiwavelength database for the Boötes extragalactic survey.

### Expert-in-Residence, African Leadership Academy (March 2009)

Spent week on campus at ALA, a pan-African leadership secondary school in Johannesburg, South Africa, to give a series of seminars in astronomy and astrophysics.

### Resident Tutor, Dunster House, Harvard University (2003–2007)

Academic tutor and resident advisor in House community of 400 students. Had residential responsibility for entryway of 30 students, and held weekly House-wide physics and astronomy review sessions. Organized intramural sports (including extensive rowing program), musical events, ski trips, and telescope nights.

### Secondary Physics Teacher (Peter Ling Fellow), Oundle School (2000–2002)

The inaugural Peter Ling Fellow at Oundle School in Northamptonshire, England, the largest co-ed boarding school in the UK. As part of this two-year teaching fellowship for young Americans, taught physics and astronomy mostly at A-level (grade 11–12), and served as Assistant Housemaster in a boarding house. Coached rugby and kayaking, and participated in school trips, including visits to the United States and Australia.

### Math Teacher, U.S. Grant (1999)

Taught supplementary after-school math program to New Haven, CT eighth-graders.

## OBSERVING AND ARCHIVE PROGRAMS

Primary author of the following observing and archive proposals:

- *Chandra* Cycle 9 DDT archive grant (PI: R. Hickox), “Ultra-deep X-ray spectra in the CDF-S: a new class of hard, unabsorbed X-ray AGN?” – *awarded: total grant \$80K*
- *Chandra* Cycle 9 archive grant (PI: C. Jones), “Harnessing the full power of *Chandra* surveys” – *awarded: total grant \$75K*
- *Suzaku* Cycle 3 observations (PI: R. Hickox), “Supermassive Black Hole Accretion in Obscured AGN and XBONGs” – *awarded: total grant \$11K*
- *Suzaku* Cycle 2 observations (PI: R. Hickox), “Superorbital variation in LMC X-4: Exploring the accretion flow” – *awarded: total grant \$23K*
- *XMM-Newton* Cycle 7 observations (PI: C. Jones), “Exploring Supermassive Black Hole Accretion in  $z > 3$  AGN, Obscured AGN and XBONGs” – *awarded*
- *Spitzer* Cycle 5 observations (PI: C. Jones), “Evolution of AGN and galaxies from  $z \sim 1$ : IRAC observations of DEEP2” – *awarded: total grant \$24K*
- MMT Hectospec observations, Fall 2009 (PI: R. Hickox), “XDEEP2: Environment and Evolution of AGN” – *awarded*
- MMT Hectospec observations, Spring & Summer 2009 (PI: R. Hickox), “AGN spectroscopy in the XBootes Deep survey” – *awarded*
- MMT Hectospec observations, Spring 2009 (PI: R. Hickox), “AGN Environments and Clustering in DEEP2 Field 2” – *awarded*
- MMT Hectospec observations, Summer 2008 (PI: S. Murray), “XDEEP2: Environment and Evolution of AGN” – *awarded*

## PROFESSIONAL ACTIVITIES

- Referee for *The Astrophysical Journal*, *Astronomy & Astrophysics*, *Monthly Notices of the Royal Astronomical Society*
- Panelist for *Swift* Guest Observer proposal review
- Member of the SAO Council and CfA Postdoc Council (2008–2009)
- Member of High Energy Astrophysics Division, American Astronomical Society
- *Chandra* press release for obscured AGN research:  
[http://chandra.harvard.edu/press/07\\_releases/press\\_031207.html](http://chandra.harvard.edu/press/07_releases/press_031207.html)
- Appeared on the “Pulsars & Quasars” episode of the TV show *The Universe* on the History Channel, aired October 2009.
- Numerous public talks at amateur astronomy clubs, open nights, and schools

## PERSONAL

U.S. Citizen, born June 7, 1978. Interests include musical performance, skiing, travel, and wilderness canoeing.

## REFERENCES

Dr. David Alexander  
Royal Society University Research Fellow  
Department of Physics  
Durham University  
South Road, Durham DH1 3LE  
United Kingdom  
+44 191 334 3594  
d.m.alexander@durham.ac.uk

Dr. Christine Jones  
Senior Astrophysicist  
Smithsonian Astrophysical Observatory  
60 Garden Street, MS-3  
Cambridge, MA 02138  
USA  
+1 (617) 495-7137  
cjf@head.cfa.harvard.edu

Prof. Ramesh Narayan  
Department of Astronomy  
Harvard University  
60 Garden Street, MS-51  
Cambridge, MA 02138  
USA  
+1 (617) 496-9393  
narayan@cfa.harvard.edu

Prof. Lars Hernquist  
Department of Astronomy  
Harvard University  
60 Garden Street, MS-51  
Cambridge, MA 02138  
USA  
+1 (617) 496-4180  
lhernqui@cfa.harvard.edu

## PUBLICATIONS

Ryan C. Hickox

### Refereed articles

1. Hung, L.-W., **Hickox, R. C.**, Boroson, B. S. & Vrtilik, S. D., 2009, “*Suzaku* X-ray spectra and pulse profile variations during the superorbital cycle of LMC X-4”, *ApJ* submitted
2. Assef, R. J. , Kochanek, C. S. , Brodwin, M., Cool, R., Forman, W. R., Gonzalez, A. H., **Hickox, R. C.**, Jones, C., Le Floch, E., Moustakas, J., Murray, S. S., & Stern, D., 2009, “Low resolution spectral templates for AGNs and galaxies from 0.03–30  $\mu\text{m}$ ”, *ApJ* submitted (arXiv:3849)
3. Brown, M. J. I., Moustakas, J., Caldwell, N., Palamara, D., Cool, R. J., Dey, A., **Hickox, R. C.**, Jannuzi, B. T., Murray, S. S. & Zaritsky, D., 2009, “Active galactic nuclei and the truncation of star formation in K+A galaxies”, *ApJ* 703, 150–158 (arXiv:0907.3185)
4. Hopkins, P. F., **Hickox, R. C.**, Quataert, E. & Hernquist, L. 2009, “Are all low-luminosity AGN really obscured?”, *MNRAS* 398, 333–349 (arXiv:0901.2936)
5. Watson, C. R., Kochanek, C. S., Forman, W. R., **Hickox, R. C.**, Jones, C. J., Brown, M. J.I., Brand, K., Dey, A., Jannuzi, B. T., Kenter, A. T., Murray, S. S., Vikhlinin, A., Eisenstein, D. J., Fazio, G. G., Green, P. J., McNamara, B. R., Rieke, M., Shields, J., “The star formation and nuclear accretion histories of normal galaxies in the AGES survey”, *ApJ*, 696, 2206–2219 (arXiv:0903:2219)
6. **Hickox, R. C.**, Jones, C., Forman, W. R., Murray, S. S., Kochanek, C. S., Eisenstein, D., Jannuzi, B. T., Dey, A., Brown, M. J. I., Stern, D., Eisenhardt, P. R., Gorjian, V., Brodwin, M., Narayan, R., Cool, R. J., Kenter, A., Caldwell, N., and Anderson, M. E. 2009, “Host galaxies, clustering, Eddington ratios, and evolution of radio, X-ray, and infrared-selected AGNs”, *ApJ* 696, 891–919 (arXiv:0901.4121)
7. Mochejska, B. J., Stanek, K. Z., Sasselov, D. D., Szentgyorgyi, A. H., Cooper, R. L., **Hickox, R. C.**, Hradecky, V., Marrone, D. P., Winn, J. N., and Schwarzenberg-Czerny, A., 2008, “Planets in Stellar Clusters Extensive Search. V. Search for planets and identification of 18 new variable stars in the old open cluster NGC 188”, *Acta Astron.*, 58, 263
8. **Hickox, R. C.**, Jones, C., Forman, W. R., Murray, S. S., Brodwin, M., Brown, M. J. I., Eisenhardt, P. R., Stern, D., Kochanek, C. S., Eisenstein, D., Cool, R. J., Jannuzi, B. T., Dey, A., Brand, K., Gorjian, V., and Caldwell, N., 2007, “A large population of mid-infrared selected, obscured active galaxies in the Boötes field”, *ApJ*, 671, 1365–1387
9. **Hickox, R. C.** & Markevitch, M. 2007, “Can *Chandra* resolve the remaining cosmic X-ray background?”, *ApJ*, 671, 1523–1531
10. **Hickox, R. C.** & Markevitch, M. 2007, “Resolving the unresolved cosmic X-ray background in the *Chandra* Deep Fields”, *ApJ*, 661, L117–L121
11. Abazajian, K. M., Markevitch, M., Koushiappas, S. M., & **Hickox, R. C.** 2007, “Limits on the radiative decay of sterile neutrino dark matter from the unresolved cosmic and soft X-ray backgrounds”, *Phys. Rev. D*, 75, 063511
12. **Hickox, R. C.** & Markevitch, M. 2006, “Absolute measurement of the unresolved cosmic X-ray background in the 0.5–8 keV band with *Chandra*”, *ApJ*, 645, 95–114
13. Mochejska, B. J., Stanek, K. Z., Sasselov, D. D., Szentgyorgyi, A. H., Adams, E., Cooper, R. L., Foster, J. B., Hartman, J. D., **Hickox, R. C.**, Lai, K., Westover, M., Winn, J. N. 2006, “Planets in

Stellar Clusters Extensive Search. IV. A detection of a possible transiting planet candidate in the open cluster NGC 2158", *AJ*, 131, 1090–1105

14. Fuentes, C. Stanek, K. Z., Gaudi, B. S., McLeod, B. A., Bogdanov, S., Hartman, J. D., **Hickox, R. C.**, Holman, M. J. 2005, "The hypervelocity star SDSS J090745.0+024507 is variable", *ApJ*, 636, L37–L40
15. **Hickox, R. C.** & Vrtilik, S. D. 2005, "Pulse-phase spectroscopy of SMC X-1 with *Chandra* and *XMM-Newton*: reprocessing by a precessing disk?", *ApJ*, 633, 1064–1075
16. Neilsen, J., **Hickox, R. C.**, & Vrtilik, S.D. 2004, "Phase variation in the pulse profile of SMC X-1", *ApJ*, 616, L135–L138
17. **Hickox, R. C.**, Narayan, R., & Kallman, T. R. 2004, "Origin of the soft excess in X-ray pulsars", *ApJ*, 614, 881–896
18. **Hickox, R. C.**, Belkin, I. M., Cornillon, P., and Shan, Z. 2000, "Climatology and seasonal variability of ocean fronts in the East China, Yellow and Bohai Seas from satellite SST data", *Geophysical Research Letters*, 27, 2945–2948

#### Review articles

1. **Hickox, R. C.**, "Black holes through cosmic time: Exploring the distant X-ray Universe with extragalactic *Chandra* surveys", *Chandra* Newsletter cover article, Winter 2009 (arXiv:0904:3543)

#### Conference and invited talks

1. **Hickox, R. C.**, "The big picture of AGN feedback: black hole accretion and galaxy evolution in multiwavelength surveys", Astrophysics Seminar, University of Leicester, 28 October 2009
2. **Hickox, R. C.**, "The big picture of AGN feedback – black hole accretion and galaxy evolution in multiwavelength surveys", The Monster's Fiery Breath: Feedback in Galaxies, Groups, and Clusters, Madison, WI, 1 June 2009
3. **Hickox, R. C.**, "Black holes through cosmic time: Exploring the distant X-ray Universe with extragalactic *Chandra* surveys", Invited Review Talk, NERQUAM 2009, Brandeis University, 20 May 2009
4. **Hickox, R. C.**, "Massive Halos and Violent Mergers – Supermassive Black Hole and Galaxy Evolution in the Wide-field Boötes Survey", SAAO Colloquium, South African Astronomical Observatory, Cape Town, 12 March 2009
5. **Hickox, R. C.**, "Host galaxies, clustering, and evolution of AGN", The Starburst–AGN Connection Conference, Shanghai, China, 31 October 2008
6. **Hickox, R. C.**, "Evolution and environments of active galactic nuclei", Astronomy Colloquium, Wesleyan University, Middletown, CT, 1 October 2008
7. **Hickox, R. C.**, "Clustering and evolution of radio, X-ray, and IR-selected AGN", SDSS Symposium, Chicago, IL, 15 August 2008
8. **Hickox, R. C.**, "Host galaxies, clustering, and evolution of radio, X-ray, and IR AGN at  $z < 1$ ", Radio Galaxies in the *Chandra* Era, Cambridge, MA, 10 July 2008
9. **Hickox, R. C.**, "Host galaxies, clustering, and evolution of radio, X-ray, and IR-selected AGN at  $z < 1$ ", NERQUAM 2008, Cambridge, MA, 30 May 2008

10. **Hickox, R. C.**, “Obscured quasars and the clustering of active galaxies”, Dissertation talk, AAS Annual Meeting, Austin, TX, 8–11 January 2008
11. **Hickox, R. C.**, “Mid-infrared selected obscured AGN in the Boötes field”, CCAPP Workshop: Active Galactic Nuclei in a Cosmological Context, OSU, Columbus, OH, 1–3 October 2007
12. **Hickox, R. C.** & Markevitch, M., “Resolving the unresolved cosmic X-ray background in the *Chandra* Deep Fields”, X-ray Surveys Meeting, Rhodes, Greece, 2–6 July 2007
13. **Hickox, R. C.**, “A population of obscured, infrared-selected active galaxies in the Boötes field”, *Chandra* Extragalactic Surveys Workshop, Cambridge, MA, 6–8 November 2006
14. **Hickox, R. C.**, Jones, C., Forman, W. R., Murray, S. S., Brodwin, M., & the XBoötes, *Spitzer* IRAC Shallow Survey, NOAO DWFS, & AGES Teams, “Identifying a population of obscured, infrared-selected active galaxies in the Boötes field”, AAS HEAD Meeting, San Francisco, CA, 3–7 October 2006
15. **Hickox, R. C.**, “A rich bounty of AGN in the 9 square degree Boötes field: redshift evolution and large-scale structure”, Durham Cosmology Conference: Cosmic Frontiers, Durham, UK, 31 July–4 August 2006
16. **Hickox, R. C.**, “Thousands of AGN in the 9 square degree Boötes field: X-ray and infrared properties”, NERQUAM 2006, Cambridge, MA, 30 May 2006

#### Posters

1. **Hickox, R. C.**, Assef, R. J., Kochanek, C. S., Murray, S. S., Jones, C., Forman, Satyam, V., Vikhlinin, A. and the XBoötes, AGES, NDWFS, IRAC Shallow Survey, Boötes MIPS, & FLAMEX Teams, “Optically obscured accretion in  $z \sim 0.5$  galaxies”, *Chandra’s* First Decade of Discovery, Boston, MA, 22–25 September 2009
2. Slavin, J., Wargelin, B. J. & **Hickox, R. C.**, “Evidence for solar wind charge exchange emission towards the *Chandra* Deep Field North”, *Chandra’s* First Decade of Discovery, Boston, MA, 22–25 September 2009
3. Hung, L.-W., **Hickox, R. C.**, Boroson, B., Vrtilik, S. D., “Superorbital variation in LMC X-4: tracing the precessing disk”, *Chandra’s* First Decade of Discovery, Boston, MA, 22–25 September 2009
4. **Hickox, R. C.**, Assef, R. J., Kochanek, C. S., Murray, S. S., Jones, C., Forman, Satyam, V., Vikhlinin, A. & the XBoötes, AGES, NDWFS, IRAC Shallow Survey, Boötes MIPS, and FLAMEX Teams, “Optically obscured accretion in  $z \sim 0.5$  galaxies”, *Chandra’s* First Decade of Discovery, Boston, MA, 22–25 September 2009
5. **Hickox, R. C.**, Jones, C., Forman, W. R., Murray, S. S., Anderson, M., & the NDWFS, AGES, XBoötes, & IRAC Shallow Survey Teams, “AGN Accretion Modes, Host Galaxies, And Clustering”, AAS HEAD Meeting, Los Angeles, CA, 31 March–3 April 2008
6. Jones, C., **Hickox, R.**, Murray, S., Forman, W., Brodwin, M., & the XBoötes, IRAC Shallow Survey, NDWFS, & AGES Teams, “A large population of infrared-selected, obscured AGN in the Boötes field”, AAS Annual Meeting, Seattle, WA, 5–10 January 2007
7. Anderson, M., Murray, S., Jones, C., Kenter, A., Forman, B., **Hickox, R.**, “X-ray Bright Optically Normal Galaxies (XBONGs) in the XBoötes Field”, AAS Annual Meeting, Seattle, WA, 5–10

January 2007

8. **Hickox, R. C.**, Jones, C., Forman, W. R., Murray, S. S., Brodwin, M., & the *Chandra* XBoötes, *Spitzer* IRAC Shallow Survey, AGES, & NOAO DWFS Teams, "X-ray and infrared properties of galaxies and AGNs in the 9 square degree Boötes field", The Spitzer Science Center 2005 Conference: Infrared Diagnostics of Galaxy Evolution, Pasadena, CA, 14–16 November 2005
9. **Hickox, R. C.**, Markevitch, M., & Jones, C., "Intensity of the unresolved X-ray background for 2-7 keV with *Chandra*", Six Years of Science with *Chandra* Symposium, Cambridge, MA, November 2005
10. **Hickox, R. C.** & Vrtilek, S. D., "Exploring SMC X-1 out of eclipse with *Chandra* and *XMM*", AAS HEAD Meeting, New Orleans, LA, September 2004
11. **Hickox, R. C.** & Narayan, R., "The origin of the soft excess in X-ray pulsars", AAS Annual Meeting, Atlanta, GA, January 2004