

# CURRICULUM VITAE

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## EDUCATION

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Ph.D. Astrophysics, Michigan State University	2008
M.S. Astrophysics, <i>magna cum laude</i> , Michigan State University	2005
B.S. Physics, <i>magna cum laude</i> , Georgia Institute of Technology	2002

## EMPLOYMENT

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ANR Opales Postdoctoral Fellow, Observatoire de la Côte d’Azur	2010–Present
Waterloo Scholars Postdoctoral Fellow, University of Waterloo	2008–10
Research Assistant, X-ray astrophysics, Michigan State University	2003–08
Research Assistant, Planetary nebulae, Michigan State University	2002–03
Research Assistant, Eclipsing stellar binaries, Georgia Institute of Technology	2000–02

## AWARDS & HONORS

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- Referee for AJ, ApJ, ApJL, CanTAC, & MNRAS
- Sherwood K. Haynes Award for Outstanding Graduate Student
- MSU College of Natural Science Dissertation Fellow
- Georgia Institute of Technology President’s List
- Georgia Institute of Technology Four Year Dean’s List
- Perimeter Institute Black Hole Reading Group

## COLLABORATIONS & MEMBERSHIPS

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• IXO Science Associate	2011–Present
• LOFAR, ASKAP ( <i>EMU</i> , <i>POSSUM</i> ), & SKA-Africa ( <i>MEERKAT</i> )	2010–Present
• $\Sigma\Xi$ National Scientific Research Society	2009–Present
• American Astronomical Society	2002–Present
• American Physical Society	2002–Present
• $\Sigma\Pi\Sigma$ National Physics Honor Society	2001–Present

## SCIENTIFIC SKILLS

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- Expert of astronomical radio and X-ray data reduction, analysis and interpretation
- Extensive experience analyzing IR, optical, UV, and  $\gamma$ -ray data
- Mastery of AIPS, CASA, CIAO, IRAF, OSA, and SAS analysis software
- Fluent in HTML, IDL,  $\LaTeX$ , PERL, and PYTHON programming languages
- Familiar with C/C++, FORTRAN, MEQTREES, MYSQL, SUPERMONGO, and TCL
- Command of DOS, Linux, Macintosh, and Windows computing architectures

## OBSERVING EXPERIENCE

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ASKAP-Boolardy Engineering Test Array (BETA)	2011
Low Frequency Array (LOFAR)	2011
Very Long Baseline Array (VLBA)	2011
Giant Metrewave Radio Telescope (GMRT)	2010
Very Large Array Radio Telescope (VLA)	2009

## GRANTS &amp; PROPOSALS

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PI, VLBA, “ <i>Imaging the Misdirected QSO of IRAS 09104+4109</i> ”	2010
Co-I, GMRT, “ <i>Power and Particle Content of Extragalactic Radio Sources I–III</i> ”	2008–10
Co-I, GMRT, “ <i>Morphology of Steepest Spectrum Radio Sources in Galaxy Cluster Cores</i> ”	2009
Co-I, NOAO, “ <i>The Supermassive Cluster Survey I–V</i> ”	2008–10
PI, CXO, “ <i>IRAS 09104+4109: An Extreme Brightest Cluster Galaxy</i> ”	2008
Co-I, CXO, “ <i>Conduction and Multiphase Structure in the ICM</i> ”	2008
Co-I, Spitzer, “ <i>Star Formation and AGN Feedback in BCGs</i> ”	2008
Co-I, Spitzer, “ <i>Infrared Properties of a Control Sample of Brightest Cluster Galaxies</i> ”	2008
Co-I, NSF, “ <i>Star Formation in the Universe’s Largest Galaxies</i> ”	2008
Co-I, CXO, “ <i>Quantifying Cluster Temperature Substructure</i> ”	2007
Co-I, NRAO, “ <i>Radio Feedback in Clusters and Galaxies</i> ”	2007

## STUDENT ADVISEMENT

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C. Kirkpatrick, UW Ph.D., ICM Abundance Distributions	2008–10
M. Rohanizadegan, UW Ph.D., Understanding SMBH Accretion and Spin	2008–10
J. King, NSERC UW-REU, Quantifying Scatter in the $P_{\text{jet}}-P_{\text{radio}}$ Relation	2010
B. Whuiska, NSERC UW-REU, The Largest BCG Cores in the <i>HST</i> Archive	2009
R. Myers, NSERC UW-REU, Galaxy Cluster Radio Sources in the 400 deg <sup>2</sup> Survey	2009

## SERVICE &amp; TEACHING

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Local Organizing Committee, “ <i>Non-thermal Phenomena in Colliding Galaxy Clusters</i> ”	2010
Local Organizing Committee, UW International Year of Astronomy	2009
Physics Tutor, “ <i>Introductory Honors Physics I &amp; II</i> ”	2003
Substitute Instructor & Teaching Assistant, “ <i>Visions of the Universe</i> ”	2002,03,06

## REFERENCES

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Prof. Megan Donahue	<a href="mailto:donahue@pa.msu.edu">donahue@pa.msu.edu</a>
Physics and Astronomy Department	1-517-884-5618
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 ASTRON Radio Observatory  
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 NL 7990 AA Dwingeloo, The Netherlands

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 31-521596564

## PUBLICATIONS IN PREPARATION

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(18) “*Entropy Scaling Relations of ACCEPT Galaxy Clusters*”

**K. Cavagnolo**, G. M. Voit, M. Donahue, & S. Bruch – In prep. for ApJL

(17) “*How Difficult is SMBH Spin Axis Reorientation? Implications for AGN Feedback Models*”

**K. Cavagnolo** – In prep. for ApJL

(16) “*Identifying AGN Feedback Relics Via Steep Spectrum Radio Sources*”

R. van Weeren, A. Edge, H. Röttgering, **K. Cavagnolo**, B. McNamara, M. Wise, M. Brüggen, G. Brunetti, & J. Croston – In prep. for A&A

(15) “*The Radio Halo-Merger-Cooling Connection in Galaxy Clusters at  $z \sim 0.5$* ”

E. Orrù, C. Ferrari, M. Arnaud, **K. Cavagnolo**, J. Croston, N. Jetha, G. Pratt, E. Pointecouteau, & S. Raychaudhury – In prep. for A&A

(14) “*Normalization and Scatter of the  $M-T$  Relation for Supermassive Galaxy Clusters*”

R. Mandelbaum, R. Nakajima, N. Bahcall, G. Bernstein, **K. Cavagnolo**, M. Donahue, J. Hughes, C. Keeton, A. Kravtsov, S. Miyazaki, N. Padmanabhan, & T. Schrabback – In prep. for ApJ

## FIRST AUTHOR PUBLICATIONS

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(13) “*Direct Evidence of Radiative and Mechanical Feedback from the Quasar in IRAS 09104+4109*”

**K. Cavagnolo**, M. Donahue, G. M. Voit, B. McNamara, & M. Sun – Accepted to MNRAS 2011

(12) “*A Powerful AGN Outburst in RBS 797*”

**K. Cavagnolo**, B. McNamara, M. Wise, P. Nulsen, M. Brüggen, M. Gitti, & D. Rafferty – Accepted to ApJ 2011

(11) “*A Relationship Between AGN Jet Power and Radio Luminosity*”

**K. Cavagnolo**, B. McNamara, P. Nulsen, C. Carilli, C. Jones, & L. Bîrzan – [ApJ Published, 2010](#)

(10) “*Intracluster Medium Entropy Profiles for a Chandra Archival Sample Of Galaxy Clusters*”

**K. Cavagnolo**, M. Donahue, G. M. Voit, & M. Sun – [ApJ Published, 2009](#)

(9) “*An Entropy Threshold for Strong  $H\alpha$  and Radio Emission in the Cores of Galaxy Clusters*”

**K. Cavagnolo**, M. Donahue, G. M. Voit, & M. Sun – [ApJ Published, 2008](#)

(8) “*Bandpass Dependence of X-Ray Temperatures in Galaxy Clusters*”

**K. Cavagnolo**, M. Donahue, G. M. Voit, & M. Sun – [ApJ Published, 2008](#)

## CO-AUTHORED PUBLICATIONS

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(7) “*Anisotropic Metal-enriched Outflows Driven by AGN in Clusters of Galaxies*”

C. Kirkpatrick, B. McNamara, & **K. Cavagnolo** – Accepted to ApJL 2011

(6) “*Direct Evidence for an Outflow of Metal-Enriched Gas Along the Radio Jets of Hydra A*”

C. Kirkpatrick, M. Gitti, **K. Cavagnolo**, B. McNamara, L. David, P. Nulsen, & M. Wise – [ApJL Published, 2009](#)

(5) “*A Chandra X-ray Analysis of Abell 1664: Cooling, Feedback and Star Formation in the Central Cluster Galaxy*”

C. Kirkpatrick, B. McNamara, D. Rafferty, P. Nulsen, L. Birzan, F. Kazemzadeh, M. Wise, M. Gitti, & **K. Cavagnolo** – [ApJ Published, 2009](#)

(4) “*Conduction and the Star Formation Threshold in Brightest Cluster Galaxies*”

G. M. Voit, **K. Cavagnolo**, M. Donahue, D. Rafferty, B. McNamara, & P. Nulsen – [ApJ Published, 2008](#)

(3) “*Star Formation, Radio Sources, Cooling X-Ray Gas and Galaxy Interactions in the Brightest Cluster Galaxy in 2A0335+096*”

M. Donahue, M. Sun, C. O’Dea, G. M. Voit, & **K. Cavagnolo** – [AJ Published, 2007](#)

(2) “*s-Process Abundances in Planetary Nebulae*”

B. Sharpee, Y. Zhang, R. Williams, E. Pellegrini, **K. Cavagnolo**, J. Baldwin, M. Phillips, & X. Liu –

[ApJ Published, 2007](#)

(1) “*Entropy Profiles in the Cores of Cooling Flow Clusters of Galaxies*”

M. Donahue, D. Horner, **K. Cavagnolo**, & G. M. Voit – [ApJ Published, 2006](#)

## PRESENTED WORK

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Michigan State University; Seminar	April 2011
Invited Talk: “ <i>The Future of Joint X-ray/Radio Studies of Galaxy Clusters and Groups</i> ”	
National Radio Astronomy Observatory-Socorro; Seminar	March 2011
Talk: “ <i>Pushing the Limits: Powerful AGN in Galaxy Clusters</i> ”	
UC Santa Barbara, Kavli Institute; Astrophysics and Cosmology with Galaxy Clusters	March 2011
Poster: “ <i>Probing the Quasar/Radio-mode Feedback Dichotomy with IRAS 09104+4109</i> ”	
University of Wisconsin-Madison; The Monster’s Fiery Breath Meeting	June 2009
Talk: “ <i>The AGN Jet Power and Radio Power Relationship</i> ”	
University of Waterloo; Seminar	October 2008
Invited Talk: “ <i>Using Galaxy Clusters as Galaxy Formation Labs</i> ”	
Leiden University; The Cool, Cooler, and Cold Meeting	September 2008
Invited Talk: “ <i>Understanding Cluster Cores: The Role of Core Entropy</i> ”	
Center for Study of Cosmic Evolution; Seminar	July 2008
Invited Talk: “ <i>Investigating Feedback and Relaxation in Clusters of Galaxies</i> ”	
University of Waterloo; Seminar	March 2008
Invited Talk: “ <i>From Cluster Cosmology to Galaxy Formation in Under One Hour</i> ”	
NASA Space Science and Technology Center; Seminar	February 2008
Invited Talk: “ <i>The Effect of AGN Feedback on High-Precision Cosmology</i> ”	
Center for Study of Cosmic Evolution; Seminar	January 2008
Invited Talk: “ <i>Understanding Feedback in Galaxy Clusters</i> ”	
University of Michigan; Seminar	October 2007
Invited Talk: “ <i>Band Dependence of X-ray Temperatures</i> ”	
University of Alabama-Huntsville; Eight Years of Science with Chandra Meeting	October 2007
Poster: “ <i>The Entropy-Feedback Connection and Quantifying Cluster Virialization</i> ”	
American Astronomical Society Meeting	December 2006
Poster: “ <i>Chandra Studies of Dark Matter and Galaxy Formation: Signatures from the ICM</i> ”	

International Astronomical Union Symposium

July 2006

Proceeding: “*Abundances of s-process elements in planetary nebulae: Br, Kr & Xe*”

American Astronomical Society Meeting

December 2005

Poster: “*Studies of Entropy Distributions in X-ray Luminous Clusters of Galaxies*”

American Astronomical Society Meeting

December 2004

Poster: “*Entropy Distributions in the Cores of Nearby X-ray Luminous Clusters of Galaxies*”

American Astronomical Society Meeting

December 2004

Poster: “*Radio-Free Cluster Cooling Flows*”