

## Biswas Sharma

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### Education

*Bachelor of Science (Honors), Physics*

Expected Graduation: May 2015

Area of Concentration: Astrophysics, Dual Major: Mathematics

Morehead State University, Morehead, KY

Upper Level Courses: High Energy Astrophysics; Radio Astronomy; Electricity and Magnetism; Quantum Mechanics; Space Plasma Physics; Algorithms and Advanced Data Structures; Data Mining; Partial Differential Equations

### Experience

*Student Head of CXBN-2 Science Mission*

2014-Present

Space Science Center, Morehead State University

- Used radioisotopes and data analysis techniques in R statistical programming language to characterize semiconductor X-ray detectors flown on the Cosmic X-ray Background Nanosatellite-2 spacecraft (to be launched in 2016)
- Completed Preliminary Design Review with NASA and external reviewers (Jan 23, 2015): Demonstrated compliance of science mission objectives, requirements and operations with spacecraft systems constraints

*Research Assistant*

2011-Present

Space Science Center, Morehead State University

- Used the *Chandra* Interactive Analysis of Observations (CIAO) software package tools, and wrote scripts that used shell commands, to reduce and analyze *Chandra* X-ray Observatory (CXO) datasets in Ubuntu-Linux environment
- Reduced CXO observations of supernova remnants for spatially resolved spectroscopic analysis and of nearby galaxies to detect and study discrete X-ray sources
- Used Morehead State University's 21 Meter Space Tracking Antenna to study astronomical objects in the radio wavelength and exchange telemetry with the International Sun/Earth Explorer 3 (ISEE-3) satellite, as part of the ISEE-3 Reboot Project, during its approach to earth after 36 years

*DAAD-RISE Scholar*

Summer 2013

German Academic Exchange Service - Research Internships in Science and Engineering  
Host Institute: Argelander-Institut für Astronomie, University of Bonn, Germany

- Reduced CXO observations of a complete, homogeneous, flux-limited sample of 36 high-redshift galaxy clusters ( $0.35 < z < 0.89$ ) and analyzed the X-ray peak/Brightest Cluster Galaxy and X-ray peak/weak lensing center offsets using their X-ray and optical observations to study dynamical disturbances in the clusters' cores

*Undergraduate Research Fellow*

2012-2014

Graph Theory Group, Department of Mathematics, Computer Science and Physics, Morehead State University

- Generated and tested empirical algorithms to check solutions to the  $n+k$  Queens Separation Problem

*NASA/JPL Solar System Ambassador*

2012-Present

Jet Propulsion Laboratory Solar System Ambassadors Program, Pasadena, CA

- Attended Solar System Ambassadors online training sessions with Jet Propulsion Laboratory scientists and representatives of NASA space and earth missions
- Organized public astronomy events in Morehead, Kentucky on behalf of NASA

	<p><i>Tutor</i> 2012-Present  Morehead State University Tutoring and Learning Center</p> <ul style="list-style-type: none"> <li>Tutored college freshmen, sophomores and juniors in Mathematics, Physics, Chemistry, Astronomy, Engineering Technology, English and History</li> </ul>
	<p><i>Honors Committee Member</i> 2012-Present  George M. Luckey Jr. Academic Honors Program, Morehead State University</p> <ul style="list-style-type: none"> <li>Elected and served as a member in the Honors Committee to amend and create policies for MSU's Academic Honors Program and the Honors Scholarship</li> </ul>
	<p><i>Undergraduate Research Fellow</i> 2011-2012  Department of Government, Morehead State University</p> <ul style="list-style-type: none"> <li>Conducted a literature review-based research on Military Modernization of China</li> </ul>
<b>Computer Skills</b>	<ul style="list-style-type: none"> <li><i>Languages/Software</i> : C++, Python, LabVIEW, HTML, LaTeX, Minitab, Photoshop</li> <li><i>Data Analysis Software</i> : HEASOFT, CIAO, XSPEC, DS9, GEANT as well as shell-scripting (CSH and BASH)</li> <li><i>Platforms</i> : Windows, Linux, Mac OS X</li> </ul>
<b>Research Publications</b>	<ul style="list-style-type: none"> <li>"Radio-continuum study of the nearby sculptor group galaxies. Part 3: NGC 7793 at <math>\lambda=12.2, 6</math> and <math>3</math> cm," Pannuti, Sharma, et al., 2014, Astrophysics and Space Science, October 2014, Volume 353, Issue 2, pp 603-611</li> <li>"Chandra and Very Large Array Observations of the Nearby Sd Galaxy NGC 45," Pannuti, Sharma, et al., 2015, Astronomical Journal, submitted</li> </ul>
<b>Research Presentations</b>	<ul style="list-style-type: none"> <li>Sharma, B. and Pannuti, T. G., "Observations of the Nearby Sculptor Group Galaxy NGC 7793 Made with Chandra X-ray Observatory," 2014, American Astronomical Society Kentucky Area Meeting, University of Kentucky, Lexington, KY, 3 May 2014.</li> <li>Sharma, B. and Pannuti, T. G., "Observations of the Nearby Sculptor Group Galaxy NGC 7793 Made with the Chandra X-ray Observatory," 2014, 9th Annual Morehead State University Celebration of Student Scholarship, Morehead, KY, 23 April 2014</li> <li>Sharma, B. and Doria, A., "Studying the Dynamical Disturbance in Galaxy Clusters Cores through Analysis of Chandra X-ray Observations," 2014, 13th Annual Posters-at-the-Capitol, Kentucky State Capitol, Frankfort, Kentucky, February 27, 2014</li> <li>Sharma, B. et al., "Composition of Solutions for the <math>n+k</math> Queens Separation Problem," 2013, Shenandoah Undergraduate Mathematics and Statistics Conference (SUMS), James Madison University, Harrisonburg, Virginia, September 28, 2013</li> <li>Sharma, B. and Doria, A., "Studying the Dynamical Disturbance in Galaxy Clusters Cores through Analysis of Chandra X-ray Observations," 2013, German Academic Exchange Service - Research Internships in Science and Engineering (DAAD-RISE) and RISE Professional annual scholars meeting, University of Heidelberg, Heidelberg, Germany, July 4-6, 2013</li> <li>Sharma, B. and Byrd, J.A., "Composition of Solutions for the <math>n+k</math> Queens Separation Problem," 2013, Undergraduate Math Conference, University of Tennessee, Knoxville, Tennessee, April 13, 2013</li> <li>Sharma, B. et al., "Composition of Solutions for the <math>n+k</math> Queens Separation Problem," 2013, Mathematical Association of America, Kentucky Chapter (KYMAA) Annual Meeting, Transylvania University, Lexington, Kentucky, April 5-6, 2013</li> <li>Sharma, B. and Pannuti, T.G., "Observations of the Galactic Supernova Remnant G21.5-0.9 with the Chandra X-ray Observatory," 2013, Kentucky Honors Roundtable, University of Kentucky, Lexington, KY, February 16, 2013</li> <li>Sharma, B. and Masterson, J.R., "Military Modernization of China," 2012, Celebration of Student Scholarship, Morehead State University, Morehead, KY, April 25, 2012</li> </ul>

## References

- Dr. Thomas G. Pannuti, Associate Professor of Space Science and Astrophysics  
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*Email:* t.pannuti@moreheadstate.edu, *Phone:* +1-606-783-9591
- Dr. Robin Blankenship, Associate Professor of Mathematics  
*Affiliation:* Morehead State University  
*Email:* r.blankenshi@moreheadstate.edu, *Phone:* +1-606-783-9438
- Dr. Thomas H. Reiprich, Heisenberg-Professor für Astrophysik,  
*Affiliation:* Rheinische Friedrich-Wilhelms-Universität Bonn  
*Email:* reiprich@astro.uni-bonn.de, *Phone:* +49-228-733642  
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