Proposal for *Chandra* Observations **Cycle 10**

Cover Page

Principal Investigator Prof. Megan Donahue		
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Institute MICHIGAN STATE UNIVERSITY		
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State / Province MI	**Zip / Postal Code** 48824-2320	**Country** USA
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Proposal Title Feeding the Feedback in Brightest Cluster Galaxies: Radio Sources, Coronae, and Multiple Nuclei			
Subject Category CLUSTERS OF GALAXIES			
Proposal Type GO	**Linked Proposal** N	**Distr. Medium** WWW ONLY	**Proprietary Rights** S
Total Requested Time 65.00	**Number of Targets** 1		**Proposed Budget**

Joint Proposal?	
HST Orbits	**HST Instruments:**
XMM Time	**RXTE Time:**
NOAO Nights?	**NOAO Telescope/Instruments:**
NRAO Hours	**NRAO Telescopes**

Abstract

Low-redshift brightest cluster galaxies (BCGs) having luminous radio sources are almost always located in the centers of galaxy clusters whose core gas is particularly cool and dense. Abell 193 seems to be an exception to that general trend. However, the existing 17 ksec Chandra observation reveals an extended (4 kpc) low-entropy corona centered on the BCG and perhaps a second corona associated with another of the three optical nuclei detected in the BCG with HST imaging. We propose a 65 ksec observation of the core of Abell 193 in order to characterize these nuclear X-ray sources, including the corona, and to search for cavities excavated by the radio source.

Proposal Number 10800668 Date: 2008-03-20

Admin. use only

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General Form

PI	Prof. Megan Donahue
Proposal Title	Feeding the Feedback in Brightest Cluster Galaxies: Radio Sources, Coronae, and Multiple Nuclei

Co-Investigator(s)

First Name Last Name	E-Mail Institute	Country
Ken Cavagnolo	cavagnolo@pa.msu.edu MICHIGAN STATE UNIVERSITY	USA
Ming Sun	sunm@pa.msu.edu MICHIGAN STATE UNIVERSITY	USA
G. Mark Voit	voit@msu.edu MICHIGAN STATE UNIVERSITY	USA

Are there additional Co-Is listed in the science justification? N

Is the first Co-I doing observing, rather than the PI? N **Telephone:**

Institute Endorsement

Name of Administrator	Katie Cook
Administrative Authority	Senior Contract and Grant Administrator
Administrative Institute	Contracts and Grants, Michigan State University
Admin Signature:	**Date:**
PI Signature:	**Date:**

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Target Summary

PI Prof. Megan Donahue

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Tar No	Target Name / Solar System Object / Grid Name / Target Description (keywords)	(J2000) R.A. Dec.	Offsets Y Detector Z Detector SIM Trans	Optical Monitor V-Mag	Observ. Time (ksec)	Detector Grating HRC Timing	(c/s) Count Rate 1st Order Total Fld.	Time-Constr? Ext.Src?	Grid #Points MaxDist.
1	Abell 193	01 25 07.5		N	65.0000	ACIS-S	2.000000	N	N
	NONE	+08 41 57.0				NONE		Y	
						N	2.000000		
	RICH CLUSTER (LOW-REDSHIFT)								

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ACIS Parameters (Required, Pileup, Telemetry Parameters)

PI Prof. Megan Donahue

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Tar No.	Exposure Mode / Telemetry. Format	CCDs On: I0 S0	I1 S1	I2 S2	I3 S3	S4	S5	Most Eff. CCD Time	Subarray: Type	StartRow No.Rows	Alternating Exposures: Y/N	Nbr. Rows Exp.Time	Energy Filter: Y/N	Lower Thresh. Range	Spectra: Max Count	Mult. Lines
1	TE		N	N	O1	O2		Y	NONE		N		N			
	VF	N	Y	Y	Y	Y	N									

ACIS Parameters (Custom:Telemetry Overflow Parameters)

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	Spatial Windows										
Tar No	Order	Chip	Type	Start Row	Start Col	Width	Height	Lower Threshold	Enery Range	Sample Rate	Additional Spatial Windows

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Target Constraints

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	Window Constraint			**Roll Constraints**				**Phase Dependent Observations**			
Tar No	Flag	Start Time	Stop Time	Flag	180?	Angle (degrees)	Tolerance (degrees)	Flag	Epoch(MJD) Period(days)	Min.Phase Min.Error	Max.Phase Max.Error

	Monitoring Observations				**Group Observations**			**Un-interrupt?**	**Coordinated**		**Add. Constraints**
Tar No	Flag	No.	Geometric Factor	Interval (days)	Tolerance (%)	Flag	Group ID	Interval (days)		Flag	Interval (days)	

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TOO Details

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Tar No	Trig-ger?	Alternates Group Name	Nbr. Req.	Response Window Type (days)	Start	Stop	Prob-ability	Initial Alloc.	**Followup Observations** Order	Obs. Time	Interval (days)	Tolerance (%)	Obs.Params specified by Target No.
									1				
									2				
									3				
									4				
									5				
									6				
									7				
									8				

TOO Trigger Criteria

TOO Followup Instructions

If this TOO is a resubmission of a proposal approved in the previous Cycle, should this TOO be canceled if the previous Cycle TOO is triggered?

Target Remarks

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Tar No	Remarks Coordinated Observation: Observatories