Proposal for *Chandra* Observations **Cycle 11**

Cover Page

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Proposal Title Abell 1983: An Exceptionally Rare Cool-Core Cluster with High Core Entropy			
Subject Category CLUSTERS OF GALAXIES			
Proposal Type GO	**Linked Proposal** N	**Distr. Medium** WWW ONLY	**Proprietary Rights** S
Total Requested Time 35.00	**Number of Targets** 1		**Proposed Budget**

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

Abstract

We propose to observe the peculiar cluster Abell 1983 (no current Chandra observation) to conduct a detailed study of a cluster which has characteristics of both the cool core (CC) and non-cool core (NCC) cluster populations. From the existing XMM-Newton observation the cluster looks like a NCC system with a core cooling time $>$ 3 Gyr and a gas energy content which suggests past energy injection of $> 10^{61} \erg$. Yet A1983 also looks like a CC system with $T_{core}/T_{cluster} < 1$, a peaked central metal abundance, and a BCG which is likely forming stars. A study of this rare cluster will aide in developing a better understanding of not just A1983's dynamical state, but of what may be a stage in cluster evolution which is vital to understanding the cool core/non-cool core dichotomy.

Proposal Number Date: 2009-03-17 Admin. use only

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General Form

PI	Dr. Kenneth W. Cavagnolo
Proposal Title	Abell 1983: An Exceptionally Rare Cool-Core Cluster with High Core Entropy

Co-Investigator(s)

First Name Last Name	E-Mail Institute	Country
Brian McNamara	mcnamara@uwaterloo.ca University of Waterloo	Canada

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	Jeff Chen
Administrative Authority	Chair of Physics and Astronomy
Administrative Institute	UNIVERSITY OF WATERLOO
Admin Signature:	**Date:**
PI Signature:	**Date:**

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Target Summary

PI Dr. Kenneth W. Cavagnolo

Proposal Title
Abell 1983: An Exceptionally Rare Cool-Core Cluster with High Core Entropy

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 1983 NONE INTRACLUSTER MEDIUM; POOR CLUSTER	14 52 55.2 +16 42 11.6		N	35.0000	ACIS-S NONE N	1.086000	N Y	N

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ACIS Parameters (Required, Pileup, Telemetry Parameters)

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Tar No.	Exposure Mode / Telemetry. Format	CCDs On I0	I1	I2	I3			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
		S0	S1	S2	S3	S4	S5									
1	TE		N	N	Y	Y		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

	Group Observations			**Un-interrupt?**	**Coordinated**		**Add. Constraints**
Tar No	Flag	Group ID	Interval(days)		Flag	Interval(days)	

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Monitor Observations

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Tar No	**Order**	Exp. Time (ksec)	Minimum Interval (days)	Maximum Interval (days)
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			

Tar No	**Order**	**Exp. Time (ksec)**	Minimum Interval (days)	Maximum Interval (days)
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			

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TOO Details

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Tar No	Trig-ger?	Alternates Group Name	Alternates Nbr. Req.	Response Window Type (days)	Response Window Start	Response Window Stop	Prob-ability	Initial Alloc.	Followup Observations Order	Exp. Time	Minimum Interval (days)	Maximum Interval (days)	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

PI	Dr. Kenneth W. Cavagnolo
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Tar No	Remarks Coordinated Observation: Observatories