

# Proposal for *Chandra* Observations

Cycle 12

Cover Page

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<b>Proposal Title</b> ABELL 1983: AN EXCEPTIONALLY RARE COOL-CORE CLUSTER WITH HIGH CORE ENTROPY			
<b>Subject Category</b> CLUSTERS OF GALAXIES			
<b>Proposal Type</b> GO	<b>Linked Proposal</b> N	<b>Distr. Medium</b> WWW ONLY	<b>Proprietary Rights</b> S
<b>Total Requested Time</b> 35.00	<b>Number of Targets</b> 1		<b>Proposed Budget</b>

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

## 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  $T_{\text{core}}/T_{\text{cluster}} < 1$ , 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 12800025

Date: 2010-03-08

Admin. use only

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<b>PI</b> Dr.    Kenneth Cavagnolo		
<b>Proposal Title</b> ABELL 1983:    AN EXCEPTIONALLY RARE COOL-CORE CLUSTER WITH HIGH CORE ENTROPY		
<div style="text-align: center;">Co-Investigator(s)</div>		
<b>First Name</b> <b>Last Name</b>	<b>E-Mail</b> <b>Institute</b>	<b>Country</b>
Are there additional Co-Is listed in the science justification?        N		
Is the first Co-I doing observing, rather than the PI?    N    Telephone:		

<b>Name of Administrator</b>	Jeff Z.Y. Chen
<b>Administrative Authority</b>	Chair of Physics and Astronomy
<b>Administrative Institute</b>	UNIVERSITY OF WATERLOO
<b>Admin Signature:</b>	<b>Date:</b>
<b>PI Signature:</b>	<b>Date:</b>

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## Target Summary

<b>PI</b> Dr. Kenneth Cavagnolo
<b>Proposal Title</b> ABELL 1983: AN EXCEPTIONALLY RARE COOL-CORE CLUSTER WITH HIGH CORE ENTROPY

Tar No	Target Name	(J2000)	Offsets Y Detector Z Detector SIM Trans	Optical Monitor V-Mag	Observ. Time (ksec)	Detector	(c/s) Count Rate 1st Order Total Fld.	Time- Constr? Ext.Src?	Grid #Points MaxDist.
	Solar System Object					Grating			
	Grid Name					HRC			
	Target Description (keywords)					Timing			
1	Abell 1983 NONE  IMAGING; COOLING FLOWS; INTRACLUSTER MEDIUM	14 52 44.0 +16 44 46.0		N	35.0000	ACIS-S NONE N	1.237000	P Y	N

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<b>Proposal Title</b>	ABELL 1983: AN EXCEPTIONALLY RARE COOL-CORE CLUSTER WITH HIGH CORE ENTROPY

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PI Dr. Kenneth Cavagnolo

ABELL 1983: AN EXCEPTIONALLY RARE COOL-CORE CLUSTER WITH HIGH CORE ENTROPY

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Target Constraints

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

Tar No	Group Observations			Un-inter rupt?	Coordinated		Add. Con- straints
	Flag	Group ID	Interval(days)		Flag	Interval(days)	
1	N			P	N		N

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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		Response Window			Prob-ability	Initial Alloc.	Followup Observations				
		Group Name	Nbr. Req.	Type (days)	Start	Stop			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?



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Target Remarks

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Tar No	Remarks Coordinated Observation: Observatories