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(410) 338-4700  
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## MEMORANDUM

**TO:** George Lewycky  
**FROM:** Ron Downes, USB  
**DATE:** January 14, 1993  
**SUBJECT:** Galley Proofs of Cycle 2 Program 4790

Your proposal 4790 has been reviewed by several groups at STScI, and we have had to make no changes in order to make the program implementable. Enclosed please find a galley proof of your Cycle 2 HST proposal, which is the version that will be implemented on the telescope. You should have received GASP finding charts for your targets.

We are proceeding with the long-range planning of your observations, so if you have any questions about the revisions to your proposal, please contact your **USB TA WITHIN 7 DAYS**. The only changes allowed after this period will be those based on new information about the telescope/target, and must be submitted with a strong justification.

This message is also being sent by electronic mail to both your RPS and home address.

Enclosure: Galley proof  
Change notice

ID: 4790

Proposal Type: GO

PI: LEWYCKY, GEORGE R

Title: TITAN'S ATMOSPHERE AND EVOLUTION THRU DISK RESOLVED SPECTROSCOPY

USB Contact: Reppert

Description of Changes:

No changes were made to this proposal.

PROPOSAL FOR HUBBLE SPACE TELESCOPE OBSERVATIONS

COVER PAGE

ST Sci Use  
ID 4790(P)  
Received 07-Dec-92  
Date: 13-JAN-1993:14:51:04

1.Proposal Title: TITAN'S ATMOSPHERE AND EVOLUTION THRU DISK RESOLVED SPECTROSCOPY

2.Scientific Category SOLAR SYSTEM  
3.Proposal for: GO  
4.Proposal type: 5.(If relevant)  
Continuation of: 0

Remote ID: R287

6.Principal Investigator GEORGE R LEWYCKY  
Institution MERRILL LYNCH  
Country Telephone (201) 557-3578

7.Abstract  
By using disk resolved spectroscopy with HST's HRS, a search for formaldehyde (CH2O) will be performed on Titan. Formaldehyde is known to serve as an oligomer to Hydrogen Cyanide resulting ultimately in simple precursors, purines and pyrimidines (e.g., adenine, uracils) necessary for DNA.

8.Scientific Key Words: ATMOSPHERE, SPECTROSCOPY, EVOLUTION  
FORMATON

9.Est obs time (hours) pri: 1.50 par: 0.00 10.Num targs pri: 1 par: 0

11.Instruments requested: HRS

12.Special sched req:

13.U.S. Scientists only 15.Authorizing Institutional Official

a.Reg. funds (total) \$0

b.Reg. length of funding 0 months

c.Reg. start date 1 Jan, 1980

14.PI: LEWYCKY

Title: Programmer/Analyst

Signature: Date: 1 Jan, 1980 Signature: Date: 1 Jan, 1980

I.GENERAL FORM Proposal 4790 P  
PI: GEORGE R LEWYCKY  
Date: 13-JAN-1993:14:51:11  
Proposal title:  
TITAN'S ATMOSPHERE AND EVOLUTION THRU DISK RESOLVED SPECTROSCOPY

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1.Proposers: Institution Country ESA  
Proposers -----  
George R Lewycky MERRILL LYNCH USA  
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2.Scientific Justification:  
With Voyager I's findings over a decade ago of an unique atmosphere on Saturn's moon Titan, I propose disk spectroscopy of Titan's atmosphere using HST's GHRS. Information gathered will help in determining the origin and evolution of Titan's atmosphere. Observations have never been made in the proposed wavelength regime, allowing for the discovery of new chemical constituents, most importantly formaldehyde.

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3.Description of proposed observations:  
This observation consists of a 1.5 hour exposure using the HRS in the large science aperture with the G270M filter to capture formaldehyde at 3170 Angstroms.

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4. Justification of necessity of ST observations:

Very fine resolution and specific wavelenghts are critical to this proposal in order to distinguish formaldehyde from other compounds. A groundbased observation would not be able to find trace amounts of formaldehyde and other minor species due to distance and interference of Earth's atmosphere. This proposal requires spectroscopy, therefore a groundbased observation could not return the required data.

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4. Justification of necessity of ST observations:

Using Synphot at 2700 A we calculate .135 counts per second per diode. For this reason an exposure upwards of one hour is necessary, although the actual count rate might be optimized at the central wavelenght specified in the exposure logsheet. Only one target acquisition will be necessary.

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7. Description of plans for data reduction and analysis  
Data reduction and analysis will be done at STSCI with the aid of  
a Science Data Analyst. I will use existing resources, such as  
STSDAS.  
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11. Address information:

Name: George

Lewycky

Category:  
PI

Institution:

Address: 7 DURST DRIVE

City: MILLTOWN

Zip Code: 08850

Telephone: 908-846-1216

Address period (for temporary contact, if needed):

from 1 Jan, 1980 to 1 Jan, 1980

State NJ

Country: USA

Telex:

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TARGET LIST b) Solar System Targets

Date: 13-JAN-1993:14:51:31

TARGET NO.: 1 | TARGET NAME: TITAN

TARGET DESCRIPTION: SATELLITE TITAN

TARGET POSITION LEVEL 1

TARGET POSITION LEVEL 2

STD=SATURN

STD=TITAN

TARGET POSITION LEVEL 3

WINDOWS

REF|DATA  
1 |V=8.4

COMMENTS  
OBSERVE TITAN AT GREATEST  
SEPERATION FROM SATURN.

EXPOSURE LOGSHEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ln	Seq	Target	Instr	Oper.	Aper	Spectral	Central	Optional	Num	Time	S/N	Flx	Pr	Special
Nm	Name	Name	Config	Mode	or FOV	Element	Waveln.	Parameters	Exp	Rel. Time	Ref	Ref	Ref	Requirements
1		TITAN	HRS	ACQ	2.0	MIRROR-N		BRIGHT=RETURN, FARCH-SIZE=5	S 1	25S		1	1	CYCLE 2 / 1-4; ONBOA RD ACQ FOR 2; SEQ 1 -4 NO GAP;

Comments: STEP-TIME=1.0S  
EXPECT APPROX. 2700 C/S

2		TITAN	HRS	ACQ/PEA KUP	2.0	MIRROR-N			1	102S		1	1	ONBOARD ACQ FOR 3;
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Comments: STEP TIME=1.0S

3		TITAN	HRS	IMAGE	2.0	MIRROR-N		NX = 16, NY = 16	1	256 S		1	1	
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Comments: STEP TIME=1.0S

4		TITAN	HRS	ACQUM	2.0	G270M		FP-SPLIT=STD	14	10 M		1	1	
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