



## 15248 - A Satellite Search of a Newly Discovered Dwarf Planet

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

### INVESTIGATORS

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### VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) 2013FY27	WFC3/UVIS	1	21-Dec-2017 14:03:20.0	yes

1 Total Orbits Used

### ABSTRACT

All of the largest Kuiper Belt Objects have relatively small, close-in satellites. These satellites are likely produced by direct collisions on the primaries surface and show Earth-Moon forming impacts are likely the norm of planet formation. We recently discovered the ninth intrinsically brightest KBO, 2013 FY27, likely making it one of the top 10 largest KBOs. The largest 15 KBOs have been searched for satellites using HST, with 11 of those found to have satellites. Knowledge of a satellite are important for determining the density and thus internal structure of the KBO as well as its collisional history. 2013 FY27 is extra interesting because its size is likely in the transition region. The largest several KBOs seem to have higher densities than smaller KBOs as well as show abundant signs of water ice and methane ice. In addition, all the KBOs that are likely larger than 2013 FY23 have known satellites, except for Sedna, while the smaller KBOs satellites are not as prevalent. We propose to search for satellites of 2013 FY27 for the first time with deep, high resolution imaging to see if this transition sized dwarf planet has a satellite, which can further constrain its density.

**OBSERVING DESCRIPTION**

Need to observe asteroid 2013 FY27 with multiple images to look for satellites around the object.

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Thu Dec 21 19:03:22 GMT 2017

<b>Visit</b>	<b>Proposal 15248, 1 (01), implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS Special Requirements: PCS MODE FINE; BETWEEN 11-JAN-2018:00:00:00 AND 18-APR-2018:00:00:00 <i>Comments: The one and only visit for this program. To get 4 long exposure images in the F350LP filter.</i>										
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Window</b>	<b>Ephem Center</b>				
	(1)	2013FY27	TYPE=ASTEROID,A=58.9448598251 2065,E=0.3895064721673114,I=33.06 956933841344,O=187.0983243598756 ,W=139.4577723243537,M=208.6471 99067439,EQUINOX=J2000,EPOCH =07-MAY- 2014:00:00:00,EpochTimeScale=TDB				ANGULAR_RATE 2013FY27 FROM EARTH EARTH GT 0.00028				
<i>Comments: Need to observe 2013 FY27 with several images to look for satellites. Want any stars or background sources to move several pixels between first and last image (i.e. from parallax effect of 2013 FY27) in order to have any background stars move so one can tell if an object is a background source or a satellite moving with 2013 FY27. Thus only want to observe 2013 FY27 within a month or so of opposition when it is moving greater than about 1 arcsecond per hour or 0.00028 arcseconds per second. This would be anytime between mid January 2018 to mid April 2018. Extended=NO</i>											
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>	
	1	1	(1) 2013FY27	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F350LP		POS TARG 0.0,0.0		545 Secs (545 Secs) [==>545 Secs ]	[1]	
	<i>Comments: Just simply want the main object in the center of the field with no gaps or dead areas near it.</i>										
	2	1	(1) 2013FY27	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F350LP		POS TARG 0.158,0. 070		545 Secs (545 Secs) [==>545 Secs ]	[1]	
	<i>Comments: Just simply want the main object in the center of the field with no gaps or dead areas near it.</i>										
3	1	(1) 2013FY27	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F350LP		POS TARG 0.099,0. 165		545 Secs (545 Secs) [==>545 Secs ]	[1]		
<i>Comments: Just simply want the main object in the center of the field with no gaps or dead areas near it.</i>											
4	1	(1) 2013FY27	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F350LP		POS TARG -0.060,0 .095		545 Secs (545 Secs) [==>545 Secs ]	[1]		
<i>Comments: Just simply want the main object in the center of the field with no gaps or dead areas near it.</i>											

