



# 11957 - Hubble Investigation of Asteroid 21 Lutetia in Support of the Rosetta Mission Flyby

Cycle: 16, Proposal Category: GO/DD

(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) LUTETIA	WFPC2	1	08-Dec-2008 21:01:08.0	yes
02	(1) LUTETIA	ACS/SBC	1	08-Dec-2008 21:01:13.0	yes

<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>
03	(1) LUTETIA	WFPC2	1	08-Dec-2008 21:01:16.0	yes
04	(1) LUTETIA	WFPC2	1	08-Dec-2008 21:01:21.0	yes
05	(1) LUTETIA	ACS/SBC	1	08-Dec-2008 21:01:24.0	yes
13	(1) LUTETIA	WFPC2	1	08-Dec-2008 21:01:28.0	yes
14	(1) LUTETIA	WFPC2	1	08-Dec-2008 21:01:33.0	yes

7 Total Orbits Used

### **ABSTRACT**

The Rosetta mission is gearing up for a flyby encounter with the large, main belt asteroid 21 Lutetia, with closest approach on 2010 June 10. The next opposition, on 2008 December 1, is our last opportunity to make observations in time to affect the planning of the Rosetta program. We request a total of 5 orbits of Hubble observing time (2 using ACS/SBC and 3 using WFPC2) to characterize the UV albedo of Lutetia, to search for any dust debris near the main body, and to perform a deep search for companions. Even one orbit of Hubble time would provide valuable data for planning the Rosetta-Alice ultraviolet spectrometer observations, and 2 orbits are sufficient to characterize the far-UV albedo, but a 5-orbit program provides a richer scientific investigation with potentially much broader implications, both scientifically and for Rosetta planning.

### **OBSERVING DESCRIPTION**

We request a single orbit of observations of Lutetia using the ACS/SBC to measure the far-UV albedo, which will allow us to optimize the Rosetta observations made with the R-Alice UV spectrometer. A second orbit of observations, also using the ACS/SBC but made approximately 2–3 orbits after the first, will allow us to observe the opposite hemisphere on Lutetia and constrain any variation in the UV albedo with asteroid rotational phase (Lutetia’s rotational period is 8.17 hr), something that cannot be done during the Rosetta fast flyby. Two additional orbits of Hubble

observations of Lutetia using the WFPC2/PC will place the most stringent constraints possible on any dusty debris and nearby companions. (The second orbit is mainly to verify that any additional objects observed are physically associated with Lutetia.) Finally, we request one additional orbit, ideally close in time to the others, to measure the near-UV albedo of Lutetia, which will provide reflectivity data spanning the far-UV to the visible. Thus, we request a grand total of 5 orbits of Hubble time to perform an intensive investigation of Lutetia. If the 5 orbits can be scheduled consecutively, we suggest the following cadence: ACS/SBC, PC/F606W, PC/F606W, ACS/SBC, PC/F218W-F255W-F300W.

We obtained the Lutetia orbital elements and ephemerides from the JPL Horizons system. On the opposition date (2008 Dec 1), the geocentric RA and DEC (J2000) at 0h UTC are 04H:27M:07S and +20 36 38 , respectively, the heliocentric distance is 2.42 AU, the geocentric distance is 1.44 AU, and the apparent geocentric rate of motion is 40 hr<sup>-1</sup>. The relatively high rate of motion means that we should be able to verify that any new objects detected in the field are physically associated with Lutetia by observing just 1 orbit after the initial detection. We used the STScI exposure time calculators (ETCs) to determine the appropriate exposure times for all the observations. The visible albedo (22%) and average diameter (100 km) of Lutetia are well-known, and that information is used to calculate the V -mag at the time of our proposed Hubble observations. For the ETC runs, we adopted V = 10.4 (this is the faintest Lutetia will be during the observing window; it should be 0.4 mag brighter at opposition) and a solar-type spectral distribution for Lutetia. However, since the UV albedo is expected to be significantly lower than the visible albedo, we decreased the brightness used for normalizing the ACS/SBC ETC calculations by 1.85 mag, which effectively means we assumed a UV albedo of 4%. In order to obtain the best possible measurement of the UV albedo, we will take two long ( 1000 s each) exposures using the ACS/SBC: one with the F140LP filter and one with the F165LP filter. By subtracting the F165LP image from the F140LP image, we effectively obtain an image of

Lutetia averaged over the wavelength range 1400–1600 Å, which is perfect for planning exposure times for the R-Alice observations. In the net subtracted image, the ETC predicts that Lutetia will produce 100 counts (i.e., S/N 10), which easily meets our objectives. (Measuring the UV albedo to 30–50% accuracy should be sufficient for planning the R-Alice program.)

To search for dust debris and companions, we want to go as deep as possible at visible wavelengths. Thus, we have selected the WFPC2/PC with the F606W filter. We plan to follow a strategy similar to that employed during our discovery (using Hubble) of Pluto's faint satellites Nix and Hydra (Weaver et al. *Nature*, v439, 943–945, 2006), namely, take a short exposure of the central object (Lutetia in this case) so that it doesn't saturate and use the rest of the orbit for several much longer exposures that can be combined to create an extremely deep image. For the short PC exposures (we will take at least two short exposures at two different CCD locations to avoid bad pixels), the brightness of Lutetia forces us to use the smallest available exposure time of 0.11 s. There should be no saturation in this case, even at opposition when  $V = 10$ , because the asteroid will be slightly resolved. Nevertheless, we expect to use the 14 e/DN gain setting to ensure that none of the pixels are saturated. These short PC exposures will allow us to measure the visible brightness of Lutetia itself with high S/N (300) and also to obtain an accurate measure of the radial brightness profile in the immediate vicinity of Lutetia to search for dust debris. For the long PC exposures, taken in the same orbit as the short exposures, we must trade-off the competing constraints of going deep, not saturating near Lutetia where we want to search for dust debris and companions, and minimizing operational overheads. We conclude that taking 10 dithered images, each having an exposure time of 160 s, is the optimal strategy for our objectives. The effective exposure time of 1600 s for the combined deep image will allow us to reach a limiting magnitude (S/N=5) of  $V = 27.5$  in the region of the image not strongly affected by the wings of the Lutetia image. For an object having the same visible albedo of Lutetia (22%), this magnitude limit corresponds to an effective diameter of 30 m. Following the work of Steffl et al. (*AJ*, v132, 614–619, 2006), we estimate that we should be able to search for objects down to a diameter of 100 m (corresponding to  $V = 25$ )

at 3 from Lutetia. By carefully combining the data from both the short and long exposures to create a radial brightness profile that extends right up to the surface of Lutetia, and by comparing that profile to synthetic PSFs generated by the TinyTim software, we expect to put the best limits possible on any dust debris near Lutetia. (Setting strict quantitative upper limits on the debris field requires extensive modeling that is beyond the scope of this proposal. At this stage, we are simply saying that a sensitive search for dust debris will be performed. If our Hubble data show convincing evidence for dust debris, extensive modeling will be done to assess any potential hazard to the Rosetta spacecraft and this, in turn, may affect the selection of the exact flyby distance.)

As mentioned earlier, the rotational period of Lutetia is well-determined at 8.17 hr. The solutions for the rotational pole location suggest that it lies in the ecliptic plane<sup>7</sup>, which implies there is some chance that the pole could be pointing toward Earth now, or nearly so, and that essentially only a single hemisphere of Lutetia will be visible during the Hubble observations. But since there are large uncertainties in the pole location, since significant (15–20%) brightness variations have been detected during all the previous observations of Lutetia, since the UV variation is not necessarily identical to the visible and IR variations, and since the UV variation with rotational phase cannot be measured during the fast Rosetta flyby, we have concluded it would be prudent to attempt two sets of UV observations of Lutetia separated by approximately one-half of the rotational period, which translates to making the second set of ACS/SBC observations 2–3 orbits after the first one.

For the fifth and final orbit, our objective is to measure the near-UV albedo of Lutetia in a region that is inaccessible from ground-based facilities. Specifically, we plan to take images through three near-UV filters: F218W, F255W, and F300W. (We recognize that the F218W data may be dominated by long wavelength light because the spectrum of the asteroid is so red, but we plan to model that effect.) For our ETC calculations, we used a G0 stellar spectrum with  $V = 10.8$ , which is equivalent to using a near-UV albedo of 15%. The total exposure times need to achieve

S/N=100 for the F218W, F255W, and F300W filters, respectively, are 287 s, 55 s, and 2 s. For the observations, we plan to take 5 F218W images, each with an exposure time of 160 s, 5 F255W images, each with an exposure time of 60 s, and 5 F300W images, each with an exposure time of 2 s. We will additionally take (in the same orbit) 3 short (0.11 s with a gain of 14 e/DN) exposures with the F606W filter to more accurately tie together the near-UV and visible results.

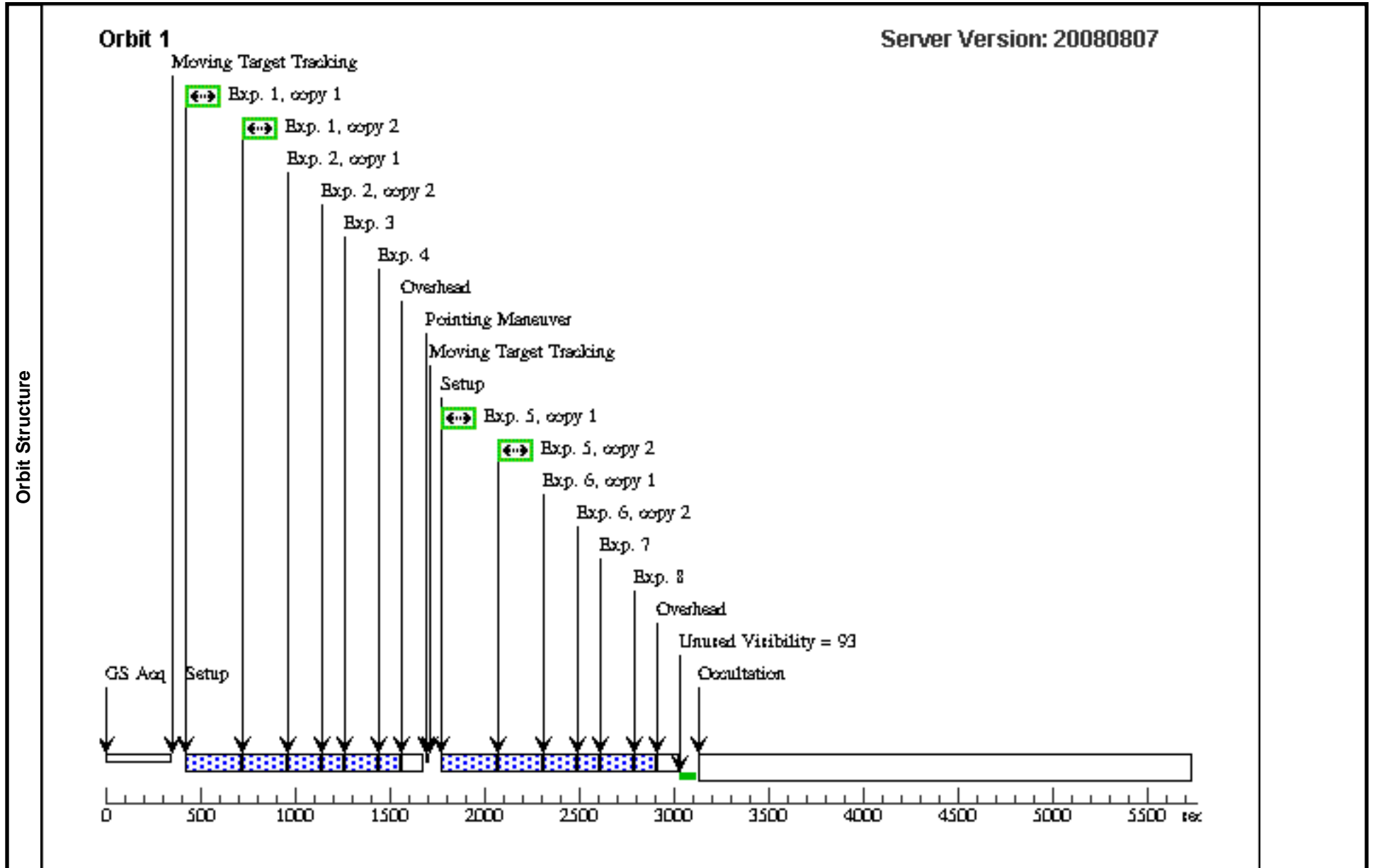
#### **ADDITIONAL COMMENTS**

Visits 13 and 14 were added, after the original program executed, to repeat and follow up on visits 03 and 04. We request TDRSS dumps to be scheduled as soon as possible after both of these visits.

Proposal 11957 - Visit 01 - Hubble Investigation of Asteroid 21 Lutetia in Support of the Rosetta Mission Flyby

Tue Dec 09 02:01:37 GMT 2008

Visit	<b>Proposal 11957, Visit 01, completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: SEQ 01,02,03,04,05 WITHIN 5.3 Orbits									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
	(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) LUTETIA	WFPC2, IMAGE, PC1	F218W			POS TARG -5.249,-5.249		160 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	2	(1) LUTETIA	WFPC2, IMAGE, PC1	F255W			POS TARG -5.249,-5.249		40 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	3	(1) LUTETIA	WFPC2, IMAGE, PC1	F300W			POS TARG -5.249,-5.249		2 Secs [==>]	[1]
	4	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		ATD-GAIN=15	POS TARG -5.249,-5.249		0.11 Secs [==>]	[1]
	5	(1) LUTETIA	WFPC2, IMAGE, PC1	F218W			POS TARG -5,-5		160 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	6	(1) LUTETIA	WFPC2, IMAGE, PC1	F255W			POS TARG -5,-5		40 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	7	(1) LUTETIA	WFPC2, IMAGE, PC1	F300W			POS TARG -5,-5		2 Secs [==>]	[1]
	8	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		ATD-GAIN=15	POS TARG -5,-5		0.11 Secs [==>]	[1]

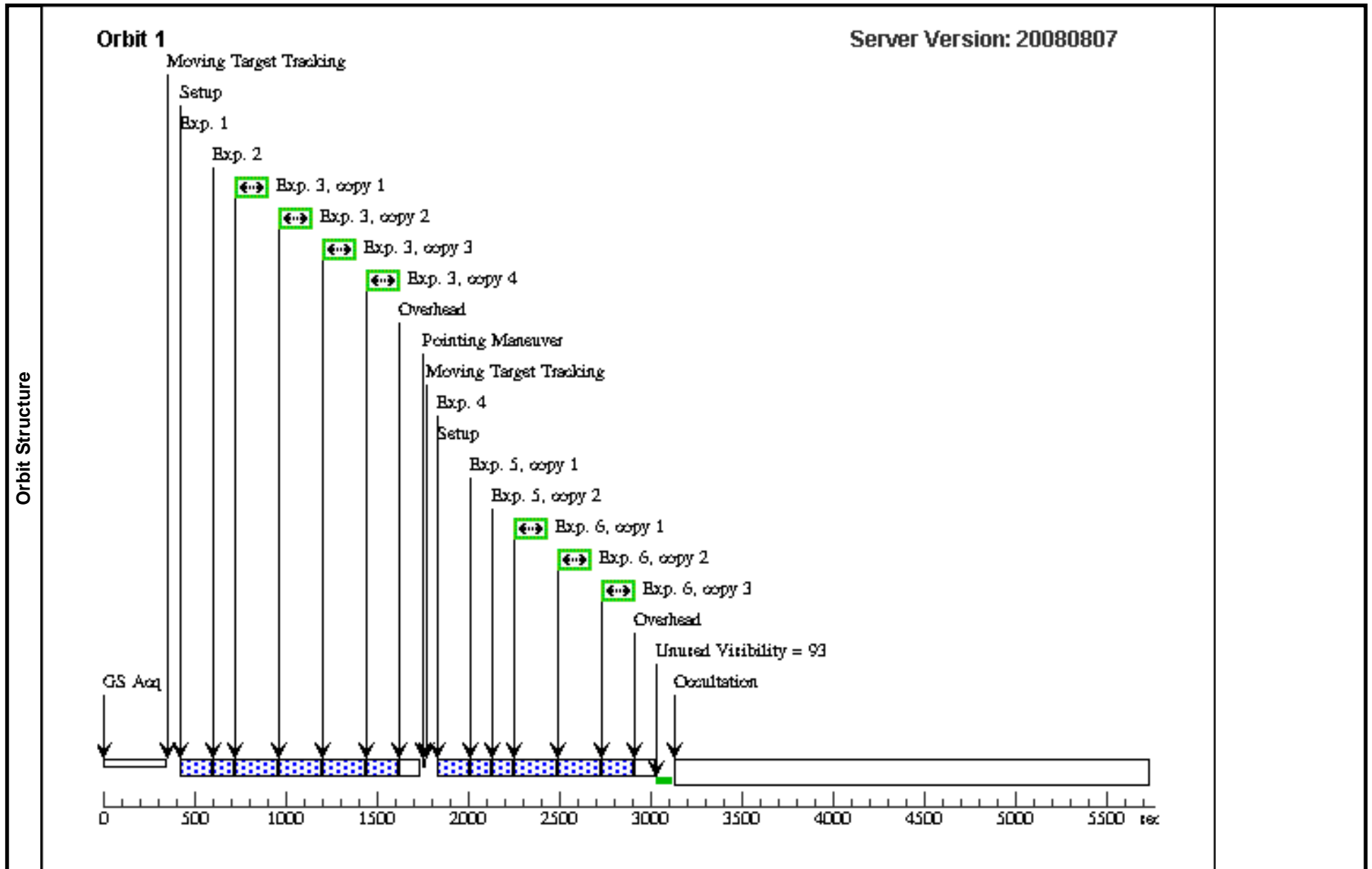


<b>Visit</b>	Proposal 11957, Visit 02, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: (none)									
<b>Solar System Targets</b>	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH		
<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) LUTETIA		ACS/SBC, ACCUM, SBC	F140LP				1270 Secs	
									[=>]	[1]
	2	(1) LUTETIA		ACS/SBC, ACCUM, SBC	F165LP				1270 Secs	
									[=>]	[1]
<b>Orbit Structure</b>	<p><b>Orbit 1</b> <span style="float: right;">Server Version: 20080807</span></p> <p>Moving Target Tracking</p> <p>GS Acq   Setup   Exp. 1   Exp. 2   Occultation</p> <p>Unused Visibility = 80</p> <p>0   500   1000   1500   2000   2500   3000   3500   4000   4500   5000   5500 sec</p>									

Proposal 11957 - Visit 03 - Hubble Investigation of Asteroid 21 Lutetia in Support of the Rosetta Mission Flyby

Tue Dec 09 02:01:39 GMT 2008

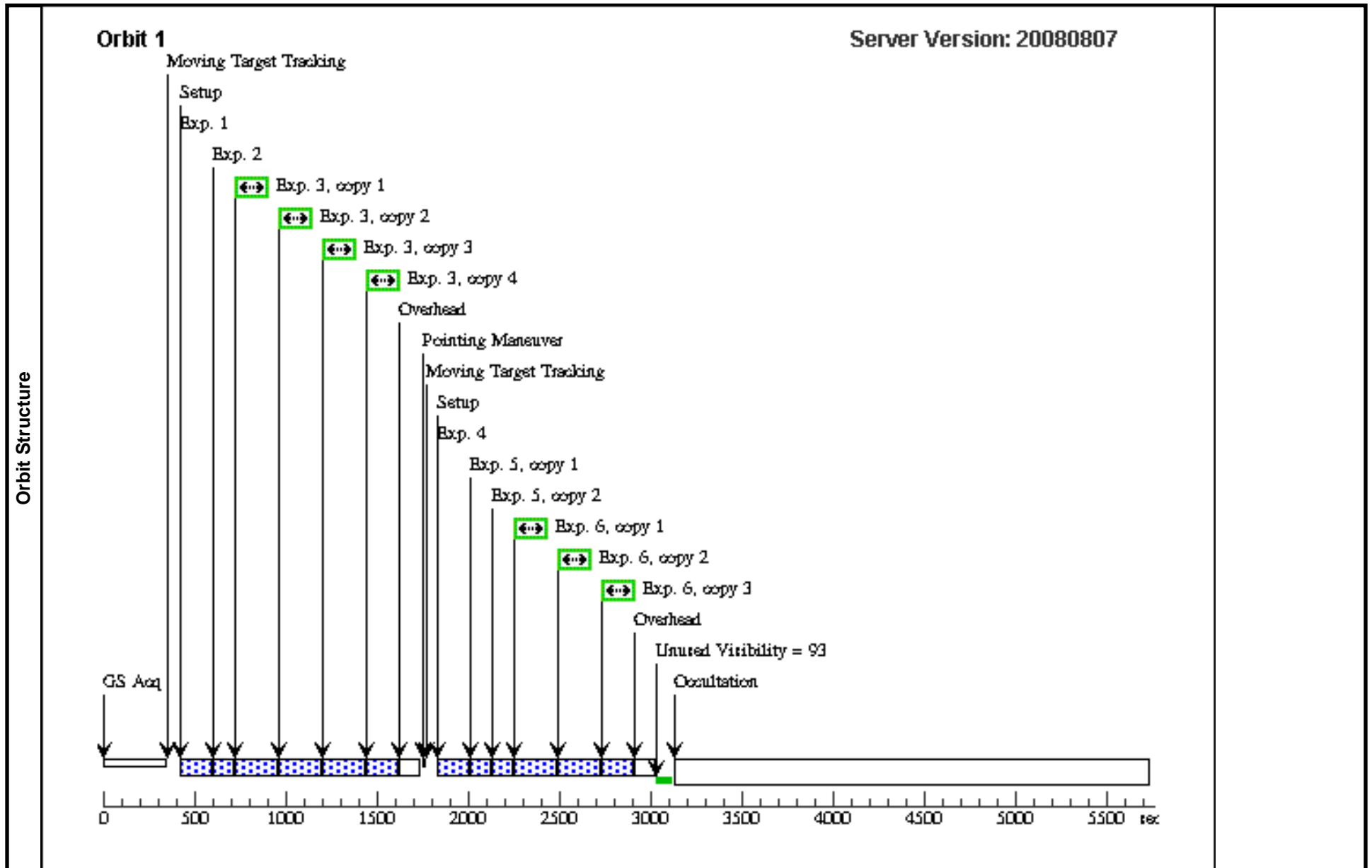
Visit	Proposal 11957, Visit 03, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)										
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
Solar System Targets	(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W	ATD-GAIN=15	POS TARG -5.249,-5.249			0.11 Secs [==>]	[1]	
	2	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		POS TARG -5.249,-5.249			40 Secs [==>]	[1]	
	3	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		POS TARG -5.249,-5.249			160 Secs X 4 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)]	[1]	
	4	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W	ATD-GAIN=15	POS TARG -5,-5			0.11 Secs [==>]	[1]	
	5	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		POS TARG -5,-5			40 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]	
	6	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		POS TARG -5,-5			160 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]	



Proposal 11957 - Visit 04 - Hubble Investigation of Asteroid 21 Lutetia in Support of the Rosetta Mission Flyby

Tue Dec 09 02:01:39 GMT 2008

Visit	<b>Proposal 11957, Visit 04, completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: (none)									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
	(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W	ATD-GAIN=15	POS TARG -5.249,-5.249			0.11 Secs [==>]	[1]
	2	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -5.249,-5.249		40 Secs [==>]	[1]
	3	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -5.249,-5.249		160 Secs X 4 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)]	[1]
	4	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W	ATD-GAIN=15		POS TARG -5,-5		0.11 Secs [==>]	[1]
	5	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -5,-5		40 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	6	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -5,-5		160 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]

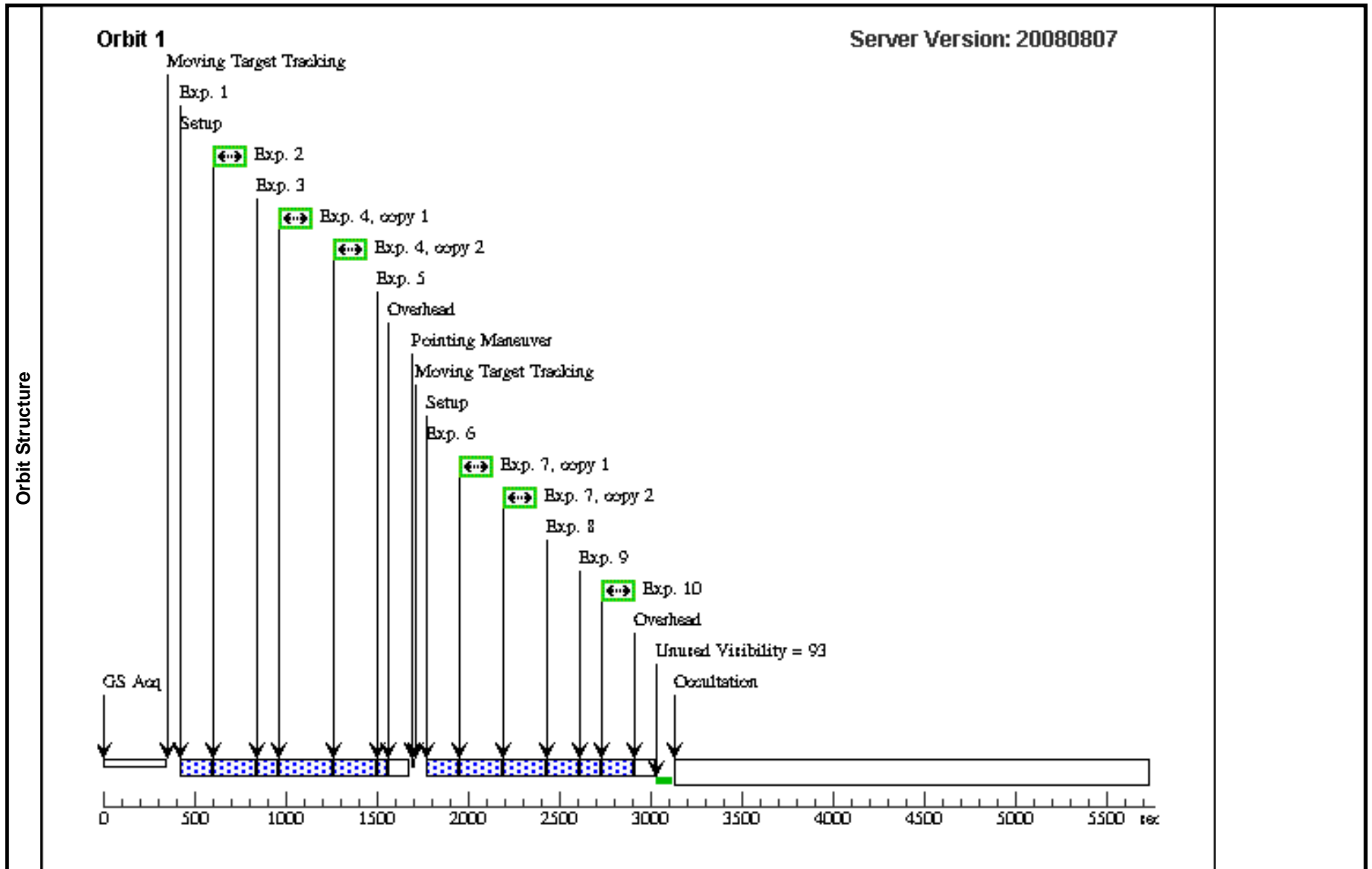


<b>Visit</b>	Proposal 11957, Visit 05, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: (none)									
<b>Solar System Targets</b>	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH		
<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) LUTETIA		ACS/SBC, ACCUM, SBC	F140LP				1270 Secs	
									[==>]	[1]
	2	(1) LUTETIA		ACS/SBC, ACCUM, SBC	F165LP				1270 Secs	
									[==>]	[1]
<b>Orbit Structure</b>	<b>Orbit 1</b> <span style="float: right;">Server Version: 20080807</span> Moving Target Tracking GS Acq Setup Exp. 1 Exp. 2 Unused Visibility = 80 Occultation <p>The diagram shows a horizontal timeline from 0 to 5500 seconds. Key events are marked with arrows: 'GS Acq Setup' at ~200s, 'Exp. 1' (green box) at ~400s, 'Exp. 2' (green box) at ~1750s, 'Unused Visibility = 80' at ~3050s, and 'Occultation' at ~3100s. A blue checkered bar represents the observation window from ~400s to ~3050s. A solid black bar represents the occultation period from ~3100s to ~5500s.</p>									
	0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 sec									

Proposal 11957 - Visit 13 - Hubble Investigation of Asteroid 21 Lutetia in Support of the Rosetta Mission Flyby

Tue Dec 09 02:01:40 GMT 2008

Visit	<b>Proposal 11957, Visit 13, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: (none)									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
	(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6.249,-6.249		40 Secs [==>]	[1]
	2	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6.249,-6.249		160 Secs [==>]	[1]
	3	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W	ATD-GAIN=15		POS TARG -6.249,-6.249		0.11 Secs [==>]	[1]
	4	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W	CR-SPLIT=NO		POS TARG -6.249,-6.249		140 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	5	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W	ATD-GAIN=15		POS TARG -6.249,-6.249		0.35 Secs [==>]	[1]
	6	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W	ATD-GAIN=15		POS TARG -6,-6		0.35 Secs [==>]	[1]
	7	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W	CR-SPLIT=NO		POS TARG -6,-6		140 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	8	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W	ATD-GAIN=15		POS TARG -6,-6		0.11 Secs [==>]	[1]
	9	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6,-6		40 Secs [==>]	[1]
10	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6,-6		160 Secs [==>]	[1]	



Proposal 11957 - Visit 14 - Hubble Investigation of Asteroid 21 Lutetia in Support of the Rosetta Mission Flyby

Tue Dec 09 02:01:41 GMT 2008

Visit	Proposal 11957, Visit 14									
	Diagnostic Status: No Diagnostics									
Solar System Targets	Scientific Instruments: WFPC2									
	Special Requirements: AFTER 13 BY 24 H TO 36 H									
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
(1)	LUTETIA	TYPE=ASTEROID,A=2.43665515426 8493,E=0.1617304906531877,I=3.066 937765356453,O=80.99203587426756 ,W=250.1298331884249,M=176.8215 074616499,EQUINOX=J2000,EPOCH =12-DEC-1990:00:00:00					EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6.249,-6.249		40 Secs [==>]	[1]
	2	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6.249,-6.249		160 Secs [==>]	[1]
	3	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		ATD-GAIN=15	POS TARG -6.249,-6.249		0.11 Secs [==>]	[1]
	4	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W		CR-SPLIT=NO	POS TARG -6.249,-6.249		140 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	5	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W		ATD-GAIN=15	POS TARG -6.249,-6.249		0.35 Secs [==>]	[1]
	6	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W		ATD-GAIN=15	POS TARG -6,-6		0.35 Secs [==>]	[1]
	7	(1) LUTETIA	WFPC2, IMAGE, PC1	F450W		CR-SPLIT=NO	POS TARG -6,-6		140 Secs X 2 [==>(Copy 1)] [==>(Copy 2)]	[1]
	8	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W		ATD-GAIN=15	POS TARG -6,-6		0.11 Secs [==>]	[1]
	9	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6,-6		40 Secs [==>]	[1]
10	(1) LUTETIA	WFPC2, IMAGE, PC1	F606W			POS TARG -6,-6		160 Secs [==>]	[1]	

