



16903 - Late-time imaging of Type Ia supernova SN 2017erp

Cycle: 29, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Or Graur (PI) (ESA Member) (Contact)	University of Portsmouth	or.graur@port.ac.uk
Dr. Saurabh W. Jha (CoI) (AdminUSPI)	Rutgers the State University of New Jersey	saurabh@physics.rutgers.edu
Dr. Adam Riess (CoI)	The Johns Hopkins University	ariess@stsci.edu
Dr. Wenlong Yuan (CoI)	The Johns Hopkins University	wenlongtamu@gmail.com

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) SN-2017ERP	WFC3/UVIS	3	23-Dec-2021 10:00:44.0	yes

3 Total Orbits Used

ABSTRACT

We ask for 3 WFC3/UVIS orbits to obtain F438W, F555W, and F814W images of the location of the Type Ia supernova (SN) 2017erp. We recently discovered a point source at the location of the SN in WFC3/IR observations taken during Feb. and Sep. 2021. We rule out the SN itself or a light echo. Instead, the object is consistent with a subgiant or red giant at a temperature of ~ 5000 K, but with an abnormally high luminosity of $\sim 33,000$ Solar luminosities. It may be a clump of red giants or a globular cluster at or behind the location of the SN. No other SN Ia has ever been directly associated with such a stellar group. A more exciting possibility is that this object is the shock-heated surviving companion of SN 2017erp's progenitor. If so, this will be the first-ever detection of a surviving companion in a normal SN Ia. It would also provide direct evidence of the "single degenerate" channel whereby a white dwarf explodes after accreting matter from a main sequence or evolved star. WFC3/UVIS has a higher resolution than WFC3/IR, which will allow us to precisely test the object's coincidence with the SN and determine whether it is resolved or not. The

Proposal 16903 (STScI Edit Number: 0, Created: Thursday, December 23, 2021 at 10:00:45 AM Eastern Standard Time) - Overview
images will also flesh out the object's spectral energy distribution, for a more accurate classification, temperature, and luminosity. We ask for DD time so that these observations will be scheduled during 3-10 January 2022 or 14-28 February 2022, when one last infrared visit to this field is planned. By obtaining optical and infrared images at the same time, we will gain a complete snapshot of the object at a single moment in time, providing a baseline for comparison with any future observations to test the object's variability.

OBSERVING DESCRIPTION

The goal of this program is to obtain deep, clean images of the location of the Type Ia supernova 2017erp in F438W, F555W, and F814W. To that end, each orbit is devoted to one filter using a WFC3-UVIS-DITHER-BOX pattern.

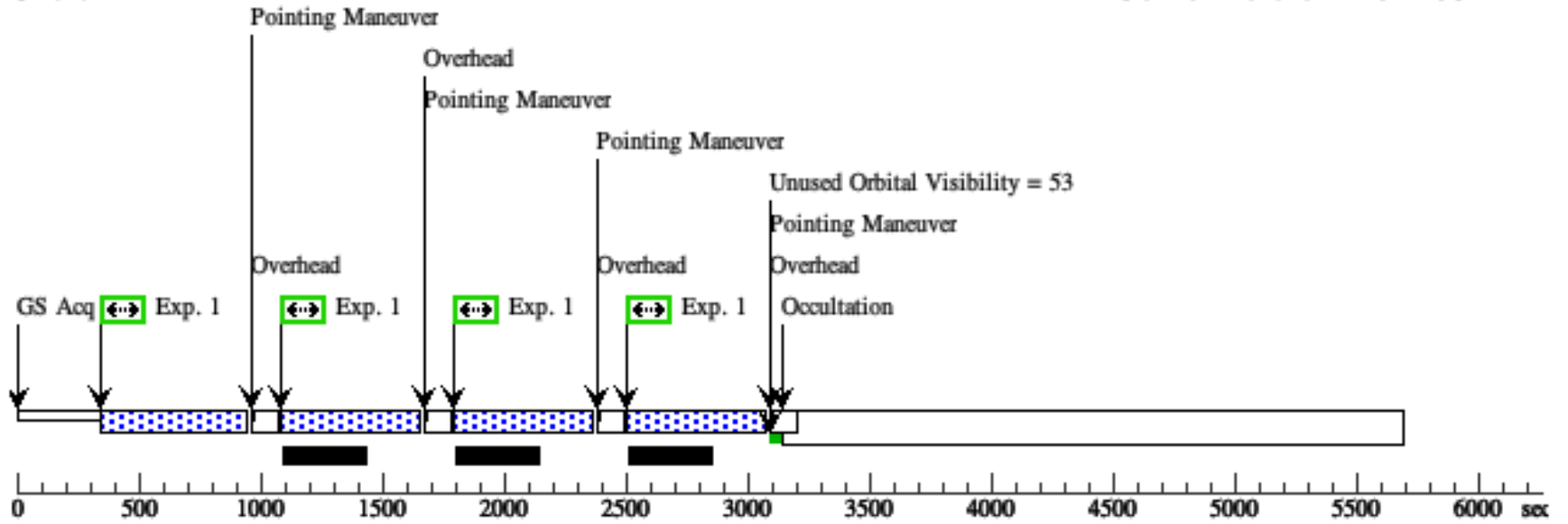
A critical aspect of this program is that it be carried out together with, or as close as possible to, visit 14 from program GO-16250 (the last visit to NGC 5861 in that program). That visit will provide F110W and F160W observations of the same location. We ask that our program be scheduled within +/- 2 days of GO-16250 visit 14 (the last visit to NGC 5861). Ideally, our program and GO-16250 visit 14 would be carried out together, as if they were one combined visit.

Proposal 16903 - Visit 01 - Late-time imaging of Type Ia supernova SN 2017erp

Thu Dec 23 15:00:45 GMT 2021

Visit	Proposal 16903, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1), (2), (3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	SN-2017ERP	RA: 15 09 14.8100 (227.3117083d) Dec: -11 20 3.20 (-11.33422d) Equinox: J2000	Epoch of Position: 2015.5	V=25	Reference Frame: SIMBAD				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=EXT-STAR Description=[SUPERNOVA]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) SN-2017ERP	WFC3/UVIS, ACCUM, UVIS1	F438W	FLASH=12		Pattern 1, Exps 1-1 in Visit 01 (1)	575 Secs (2300 Secs)	
									[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]
	2		(1) SN-2017ERP	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=1		Pattern 1, Exps 2-2 in Visit 01 (1)	575 Secs (2300 Secs)	
								[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	
3		(1) SN-2017ERP	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=4			Pattern 1, Exps 3-3 in Visit 01 (1)	575 Secs (2300 Secs)	
								[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[3]	

Orbit 1



Orbit Structure

Orbit 2

Server Version: 20210514

