



11193 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

Cycle: 16, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Wolfgang Brandner (PI)	University of California - Los Angeles	brandner@astro.ucla.edu
Dr. Andrea Stolte (CoI)	University of California - Los Angeles	astolte@astro.ucla.edu
Dr. Dimitrios Gouliermis (CoI) (ESA Member)	Max-Planck-Institut fur Astronomie, Heidelberg	dgoulier@mpia-hd.mpg.de

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) NGC3603FIELD1 ANY	NIC2 WFPC2	2	09-May-2007 23:55:40.0	yes
02	(2) NGC3603FIELD2 ANY	NIC2 WFPC2	2	09-May-2007 23:57:06.0	yes
03	(3) NGC3603FIELD3 ANY	NIC2 WFPC2	2	09-May-2007 23:57:48.0	yes
04	(4) NGC3603FIELD4 ANY	NIC2 WFPC2	2	09-May-2007 23:46:14.0	yes

8 Total Orbits Used

ABSTRACT

NGC 3603, located in the Carina spiral arm, is one of the most luminous giant HII regions in the Milky Way, and as such it is often referred to as a prime template for extragalactic starbursts. While previous studies were focussing on the high and intermediate mass stellar content of the central starburst cluster, which powers the HII region, the effects of the starburst environment with its large number of ionizing O stars on the emerging low-mass population are unknown. As the most nearby, most easily accessible starburst, NGC 3603 provides the best testbed to study the long-lived, low-mass stars originating from a starburst environment. Taking advantage of the large field of view and high sensitivity of WFPC2, we want to survey the stellar population in an area of 10pc x 10pc (6' x 6') down to a mass limit of 0.2 to 0.5 Mo. This will enable us to derive the total cluster mass, look for spatial variations in the initial mass function, determine the age of the dispersed low-mass population in the HII region and search for evidence of sequential star formation. Ultimately, we aim at reconstructing the low-mass stellar initial mass function of the starburst epoch in NGC 3603, which in turn will advance our understanding of extragalactic starburst phenomena and the emerging low-mass stars as observed in ancient populations. The observations of NGC 3603 are part of our larger effort to study intense star-forming regions in the Milky Way, LMC and SMC.

OBSERVING DESCRIPTION

The primary observations will be carried out with WFPC2. We aim to cover roughly half of the giant HII region NGC 3603, with the central starburst cluster located in the south-western corner of a 2 times 2 sparse WFPC2 mosaic. The region has been selected to have the lowest contamination by nebular emission and foreground clouds. Each visit will include observations in the F555W, F675W, and F814W filters, with short and longer integration times in order to improve the dynamic range. A 4-point dither pattern will be implemented as proper PSF sampling is most critical to overcome crowding for deriving the mass function down to 0.5 M_{Sun}. For visit 1, the range of HST orientations is limited in order to avoid the brightest patches of diffuse emission of the HII region, and to provide optimal overlap with archival WFPC2 data of the cluster.

Observations in F675W are required in order to estimate the number of low-mass stars with masses <0.5 M_{Sun} missed in F555W due to patchy extinction, and to distinguish very low-mass pre-main sequence stars from bluer foreground and reddened background stars.

Including overheads for acquisition, instrumental set-up, dithering and filter changes, the described sequence can be fitted into 2 orbits. For each of

the 4 fields, a separate visit is planned, resulting in a total of 8 orbits in order to cover a ~ 6 arcmin times 6 arcmin region.

The coordinated parallel observations with NIC2 will provide additional samples of the dispersed field, fore- and background stellar populations in the direction of NGC 3603. For NIC2, we will use the F110W, F160W, and F205W filters. Observing times will be scaled according to the WFPC2 observations.

Proposal 11193 - Visit 01 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

Thu May 10 15:19:22 GMT 2007

Visit	Proposal 11193, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: NIC2, WFPC2 Special Requirements: ORIENT 165.0D TO 195.0 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559 Line Spacing=0.559	Coordinate Frame=POS-TARG Pattern Orientation=26.57 Angle Between Sides=143.13 Center Pattern=false		(1-7)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC3603FIELD1	RA: 11 15 7.4000 (168.7808333d) Dec: -61 15 38.00 (-61.26056d) Equinox: J2000		V=11.2+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	WFPC2 F81 4W	(1) NGC3603FIELD 1	WFPC2, IMAGE, PC1	F814W	CR-SPLIT=0.1		Pattern 1-7 (1) Prime + Parallel Group 1-7	180.0 Secs [=>(Pattern 1, Split 1)] [=>(Pattern 1, Split 2)] [=>(Pattern 2, Split 1)] [=>(Pattern 2, Split 2)]	[1]
									[=>(Pattern 3, Split 1)] [=>(Pattern 3, Split 2)] [=>(Pattern 4, Split 1)] [=>(Pattern 4, Split 2)]	[2]
2	WFPC2 F67 5W	(1) NGC3603FIELD 1	WFPC2, IMAGE, PC1	F675W	CR-SPLIT=0.1		Pattern 1-7 (1) Prime + Parallel Group 1-7	180.0 Secs [=>(Pattern 1, Split 1)] [=>(Pattern 1, Split 2)] [=>(Pattern 2, Split 1)] [=>(Pattern 2, Split 2)]	[1]	
									[=>(Pattern 3, Split 1)] [=>(Pattern 3, Split 2)] [=>(Pattern 4, Split 1)] [=>(Pattern 4, Split 2)]	[2]

Proposal 11193 - Visit 01 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	3	WFPC2 F55 5W	(1) NGC3603FIELD 1	WFPC2, IMAGE, PC1	F555W	CR-SPLIT=0.2	Pattern 1-7 (1) Prime + Parallel Gro up 1-7	140.0 Secs	
								[==>(Pattern 1, Split 1)]	[1]
								[==>(Pattern 1, Split 2)]	
								[==>(Pattern 2, Split 1)]	
	[==>(Pattern 2, Split 2)]								
	[==>(Pattern 3, Split 1)]	[2]							
	[==>(Pattern 3, Split 2)]								
	[==>(Pattern 4, Split 1)]								
	[==>(Pattern 4, Split 2)]								
	4	WFPC2 F55 5W short	(1) NGC3603FIELD 1	WFPC2, IMAGE, PC1	F555W		Pattern 1-7 (1) Prime + Parallel Gro up 1-7	0.4 Secs	
								[==>(Pattern 1)]	[1]
								[==>(Pattern 2)]	
[==>(Pattern 3)]	[2]								
[==>(Pattern 4)]									
5	NIC2 F110 W	ANY	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=STEP3 2; NSAMP=18	Pattern 1-7 (1) Prime + Parallel Gro up 1-7	[==>(Pattern 1)]	[1]	
							[==>(Pattern 2)]		
							[==>(Pattern 3)]	[2]	
							[==>(Pattern 4)]		
6	NIC2 F160 W	ANY	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP3 2; NSAMP=18	Pattern 1-7 (1) Prime + Parallel Gro up 1-7	[==>(Pattern 1)]	[1]	
							[==>(Pattern 2)]		
							[==>(Pattern 3)]	[2]	
							[==>(Pattern 4)]		
7	NIC2 F205 W	ANY	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=STEP3 2; NSAMP=22	Pattern 1-7 (1) Prime + Parallel Gro up 1-7	[==>(Pattern 1)]	[1]	
							[==>(Pattern 2)]		
							[==>(Pattern 3)]	[2]	
							[==>(Pattern 4)]		

Proposal 11193 - Visit 02 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

Thu May 10 15:19:23 GMT 2007

Visit	Proposal 11193, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: NIC2, WFPC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559 Line Spacing=0.559	Coordinate Frame=POS-TARG Pattern Orientation=26.57 Angle Between Sides=143.13 Center Pattern=false		(1-6)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	NGC3603FIELD2	RA: 11 15 23.7805 (168.8490854d) Dec: -61 12 35.61 (-61.20989d) Equinox: J2000		V=12.6+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	WFPC2 F81 4W	(2) NGC3603FIELD 2	WFPC2, IMAGE, PC1	F814W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Gro up 1-6	180.0 Secs	
									[=>(Pattern 1, Split 1)]	[1]
									[=>(Pattern 1, Split 2)]	
									[=>(Pattern 2, Split 1)]	
									[=>(Pattern 2, Split 2)]	
								[=>(Pattern 3, Split 1)]	[2]	
								[=>(Pattern 3, Split 2)]		
								[=>(Pattern 4, Split 1)]		
								[=>(Pattern 4, Split 2)]		
2	WFPC2 F67 5W	(2) NGC3603FIELD 2	WFPC2, IMAGE, PC1	F675W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Gro up 1-6	180.0 Secs		
								[=>(Pattern 1, Split 1)]	[1]	
								[=>(Pattern 1, Split 2)]		
								[=>(Pattern 2, Split 1)]		
								[=>(Pattern 2, Split 2)]		
								[=>(Pattern 3, Split 1)]	[2]	
								[=>(Pattern 3, Split 2)]		
								[=>(Pattern 4, Split 1)]		
								[=>(Pattern 4, Split 2)]		

Proposal 11193 - Visit 02 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
Exposures (continued)	3	WFPC2 F555W	(2) NGC3603FIELD 2	WFPC2, IMAGE, PC1	F555W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Group 1-6	240.0 Secs		
									[==>(Pattern 1, Split 1)]	[1]	
									[==>(Pattern 1, Split 2)]		
									[==>(Pattern 2, Split 1)]		
									[==>(Pattern 2, Split 2)]		
									[==>(Pattern 3, Split 1)]	[2]	
									[==>(Pattern 3, Split 2)]		
									[==>(Pattern 4, Split 1)]		
									[==>(Pattern 4, Split 2)]		
	4	NIC2 F110W	ANY		NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=STEP3 2; NSAMP=18		Pattern 1-6 (1) Prime + Parallel Group 1-6	[==>(Pattern 1)]	[1]
										[==>(Pattern 2)]	
[==>(Pattern 3)]										[2]	
[==>(Pattern 4)]											
5	NIC2 F160W	ANY		NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP3 2; NSAMP=18		Pattern 1-6 (1) Prime + Parallel Group 1-6	[==>(Pattern 1)]	[1]	
									[==>(Pattern 2)]		
									[==>(Pattern 3)]	[2]	
									[==>(Pattern 4)]		
6	NIC2 F205W	ANY		NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=STEP3 2; NSAMP=22		Pattern 1-6 (1) Prime + Parallel Group 1-6	[==>(Pattern 1)]	[1]	
									[==>(Pattern 2)]		
									[==>(Pattern 3)]	[2]	
									[==>(Pattern 4)]		

Proposal 11193 - Visit 03 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

Thu May 10 15:19:23 GMT 2007

Visit	Proposal 11193, Visit 03 Diagnostic Status: No Diagnostics Scientific Instruments: NIC2, WFPC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559 Line Spacing=0.559	Coordinate Frame=POS-TARG Pattern Orientation=26.57 Angle Between Sides=143.13 Center Pattern=false		(1-6)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(3)	NGC3603FIELD3	RA: 11 15 37.9883 (168.9082846d) Dec: -61 15 21.82 (-61.25606d) Equinox: J2000		V=13.1+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	WFPC2 F814W	(3) NGC3603FIELD3	WFPC2, IMAGE, PC1	F814W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Group 1-6	180.0 Secs	
									[=>(Pattern 1, Split 1)]	[1]
									[=>(Pattern 1, Split 2)]	
									[=>(Pattern 2, Split 1)]	
									[=>(Pattern 2, Split 2)]	
								[=>(Pattern 3, Split 1)]		
								[=>(Pattern 3, Split 2)]	[2]	
								[=>(Pattern 4, Split 1)]		
								[=>(Pattern 4, Split 2)]		
2	WFPC2 F675W	(3) NGC3603FIELD3	WFPC2, IMAGE, PC1	F675W	CR-SPLIT=0.05			Pattern 1-6 (1) Prime + Parallel Group 1-6	180.0 Secs	
									[=>(Pattern 1, Split 1)]	[1]
									[=>(Pattern 1, Split 2)]	
									[=>(Pattern 2, Split 1)]	
									[=>(Pattern 2, Split 2)]	
									[=>(Pattern 3, Split 1)]	
									[=>(Pattern 3, Split 2)]	[2]
									[=>(Pattern 4, Split 1)]	
									[=>(Pattern 4, Split 2)]	

Proposal 11193 - Visit 03 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
Exposures (continued)	3	WFPC2 F555W	(3) NGC3603FIELD 3	WFPC2, IMAGE, PC1	F555W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Group 1-6	240.0 Secs		
									[==>(Pattern 1, Split 1)]	[1]	
									[==>(Pattern 1, Split 2)]		
									[==>(Pattern 2, Split 1)]		
									[==>(Pattern 2, Split 2)]		
									[==>(Pattern 3, Split 1)]	[2]	
									[==>(Pattern 3, Split 2)]		
									[==>(Pattern 4, Split 1)]		
									[==>(Pattern 4, Split 2)]		
		4	NIC2 F110W	ANY	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=STEP3 2; NSAMP=18		Pattern 1-6 (1) Prime + Parallel Group 1-6	[==>(Pattern 1)]	[1]
	[==>(Pattern 2)]										
[==>(Pattern 3)]	[2]										
[==>(Pattern 4)]											
	5	NIC2 F160W	ANY	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP3 2; NSAMP=18		Pattern 1-6 (1) Prime + Parallel Group 1-6	[==>(Pattern 1)]	[1]	
[==>(Pattern 2)]											
[==>(Pattern 3)]									[2]		
[==>(Pattern 4)]											
	6	NIC2 F205W	ANY	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=STEP3 2; NSAMP=22		Pattern 1-6 (1) Prime + Parallel Group 1-6	[==>(Pattern 1)]	[1]	
[==>(Pattern 2)]											
[==>(Pattern 3)]									[2]		
[==>(Pattern 4)]											

Proposal 11193 - Visit 04 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

Thu May 10 15:19:24 GMT 2007

Visit	Proposal 11193, Visit 04 Diagnostic Status: No Diagnostics Scientific Instruments: NIC2, WFPC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559 Line Spacing=0.559	Coordinate Frame=POS-TARG Pattern Orientation=26.57 Angle Between Sides=143.13 Center Pattern=false		(1-6)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(4)	NGC3603FIELD4	RA: 11 15 44.6704 (168.9361267d) Dec: -61 10 29.01 (-61.17472d) Equinox: J2000		V=12.9+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	WFPC2 F81 4W	(4) NGC3603FIELD 4	WFPC2, IMAGE, PC1	F814W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Gro up 1-6	180.0 Secs	
									[=>(Pattern 1, Split 1)] [=>(Pattern 1, Split 2)] [=>(Pattern 2, Split 1)] [=>(Pattern 2, Split 2)]	[1]
									[=>(Pattern 3, Split 1)] [=>(Pattern 3, Split 2)] [=>(Pattern 4, Split 1)] [=>(Pattern 4, Split 2)]	[2]
	2	WFPC2 F67 5W	(4) NGC3603FIELD 4	WFPC2, IMAGE, PC1	F675W	CR-SPLIT=0.05		Pattern 1-6 (1) Prime + Parallel Gro up 1-6	180.0 Secs	
									[=>(Pattern 1, Split 1)] [=>(Pattern 1, Split 2)] [=>(Pattern 2, Split 1)] [=>(Pattern 2, Split 2)] [=>(Pattern 3, Split 1)] [=>(Pattern 3, Split 2)] [=>(Pattern 4, Split 1)] [=>(Pattern 4, Split 2)]	[1] [2]

Proposal 11193 - Visit 04 - A comprehensive study of the low-mass stellar population in the Galactic starburst region NGC 3603

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	3	WFPC2 F55 5W	(4) NGC3603FIELD 4	WFPC2, IMAGE, PC1	F555W	CR-SPLIT=0.05	Pattern 1-6 (1) Prime + Parallel Group up 1-6	240.0 Secs	
								[==>(Pattern 1, Split 1)]	[1]
								[==>(Pattern 1, Split 2)]	
								[==>(Pattern 2, Split 1)]	
	[==>(Pattern 2, Split 2)]								
	4	NIC2 F110 W	ANY	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=STEP3 2; NSAMP=18	Pattern 1-6 (1) Prime + Parallel Group up 1-6	[==>(Pattern 1)]	[1]
								[==>(Pattern 2)]	[2]
								[==>(Pattern 3)]	
[==>(Pattern 4)]									
5	NIC2 F160 W	ANY	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP3 2; NSAMP=18	Pattern 1-6 (1) Prime + Parallel Group up 1-6	[==>(Pattern 1)]	[1]	
							[==>(Pattern 2)]	[2]	
							[==>(Pattern 3)]		
							[==>(Pattern 4)]		
6	NIC2 F205 W	ANY	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=STEP3 2; NSAMP=22	Pattern 1-6 (1) Prime + Parallel Group up 1-6	[==>(Pattern 1)]	[1]	
							[==>(Pattern 2)]	[2]	
							[==>(Pattern 3)]		
							[==>(Pattern 4)]		