ObservationReport

all measures in mm | ObservationID 160 on 2022-10-29 23:38

Object				M33	
Common Name	Triangulum Galaxy				
Alternate Name	NGC598				
Visual Magnitude	5,72				
Distance ▶Object	2,73 Mly				
Apparent Size	70.8 × 41.7 "				
Object R.A.	01h 33m 50.02s			20221029_M33_ASI294_0160-02WM.jpg	
Object DEC	+30° 39′ 36.7″			Link ▶Picture	M33_20221029
WikiLink	https://en.wikipedia.org/wiki/Triangulum_Galaxy			Descpription	Spiral galaxy
				Constellation	Triangulum
Picture Data					
Work Status	Published			Quality	*****
Format	Photo			Picture Center R.A.	1h35m11s
Tot./Act. Frames/Pane	60	57		Picture Center DEC	+30°46'47"
H / V Panes	1	1		H/V FoV [°]	1,8268 1,2434
Exp. [s] / Frame	300			Above horizon [°]	51°
Total Time / Pane [min]	285,00	285,00		View Direction	83°E
Camera Data	**ZWO**			**ASI294MC-Pro**	**ZWOASI294**
Camera Angle [°]	156			Pixel Pitch [µm]	4,63
Gain or ISO	120			Camera Temp. °C	-10
Observation Site					
Observation Start	2022-10-29T23:38:53 UTC+/- +h			Observation End	2022-10-30T05:01:00
Observation Site	ES La Palma Jardin			Site Elevation /Bortle	470 3
Province	La Palma			Site Coordinates	28° 38' 52.0" N, 017° 53' 4
Sky & Moon					
Sky Index | Total Clouds	4,5		%	Moon Rise | Set	12:42:00 22:54:00
Outside Temp. °C	19			Moon Age [d]	4,3
Moon Phase |% Illum.	1st quarter	24	%	Moon ▶Target Dist.	UNKNOWN
Optical Configuration	**TS600AS294**			**TS600ASI294T252**	
Lens or Scope	TSO APO 90/600			Focuser	M90 TS600 Rack + Pinion
Type Of Build	APO Triplet Refractor			Focuser Position [mm]	0,00 EAF Steps 0
Brand	TS-Optics				
Addtional Optics	M63 WO Rotator			Optical Factor	1
Filter	-			FoL norm|actual [mm]	599 599
Diameter [mm]	90			DawesLimitLink	1,74 Arcsec
Aperture / f-stop	6,66			Optical Scale ["/px]	1,595
Other Hardware & Software					
GuideScope	Omegon 50/200			Mount	EQ6R-PRO
GuiderHW	ASiairPro			SessionControl	ASiairPro
GuiderSW	ASiairPro			PostProcessingSW	LrC, PS, PixInsight
More ...					
Work Folder	2022\20221029_M33_0160_La-Palma-Jardin				
Comment					
Remarks	1. Session Planning Used Telescopius.com for coordinates panning and camera rotation. Planned center coordinates: RA: 01hr 33' 52, DEC: 30º 39' 29				

Panes: 1x1
Camera Rotation: the camera was rotated right 90° clock-wise (from 180° to 270° on WO Rotator scale) the to achieve optimal target during the setup preparation.
Planned session times: 21:15h to 23:45h (estimated)
Target position:

- at session start: elevation 51° at 75°E
- at session end: elevation 83° at 69° E

The Telescopius pane plan was exported and re-imported to an ASIAIR plan.

2. Location and sky

Sky quality: 0% low clouds, 0% middle and 0% high clouds, sky quality: 0,99 (Index 1: 5, index 2: 4)

I took the images on the terrace of our bungalow at the La Palma Jardin facility located in Celta - El Paso - La Palma (Canary Islands) in Spain during the late night using an ASIAIR plan that was generated using the Skyatlas function of ASIAIR to center the target. The manual camera rotation was already adjusted during the earlier night. Unfortunately the sky properties where not too good, we had extremely high air humidity (>90%) and a dew point only 1° below the actual temperature resulting in sudden fog formation, but apparently the situation improved during the night, although the humidity is visible around the brighter stars in this image.

3. Session Results

I took 60 exposures of 5 minutes each (totaling to 5 hours of light) to collect enough light for this very beautiful target. The TS-Optics 90/600 APO refractor with a field of view of 1,8x1,2° was quite optimal for this target. As a result of the high air humidity 3 frames had to be discarded due to fog. The quality of the remaining 57 frames were good enough for image integration and post-processing.

4. Post Processing

Image selection, registration, background improvement and color correction were done in PixInsight (Post Processing using PixInsight (starlust.de)).

- Picture *_0000_02: was processed using the PixInsight Photometric Color Calibration process based on APASS DR9 data
- Picture *_0001_02: was processed using the new PixInsight SPCC Spectrophotometric Color Calibration process based on Gaia DR3/SP data,
- Interstingly both pictures show a different hue, the picture *_0001_02 looks more natural

Some selective color boosting was applied using Photoshop (Selective Color Boosting Using Photoshop (starlust.de)).
Nevertheless no color or hue changes have been applied, the final image is showing natural colors.

Applied new post-processing **noise reduction** approach on March 13, 2024 starting with ***_0001_SPCC.xisf**:

- Image *_0001_SPCC.xisf > **NoiseXTerminator** > *_0002_SPCC_NX.xisf

```
var P = new NoiseXTerminator;
P.ai_file = "NoiseXTerminator.2.pb";
P.denoise = 0.90;
P.detail = 0.28;
```

- *_0002_SPCC_NX.xisf > **BlurXTerminator** > *_0002_SPCC_NXBX.xisf

```
var P = new BlurXTerminator;
P.ai_file = "BlurXTerminator.4.pb";
P.correct_only = false;
P.correct_first = false;
P.nonstellar_then_stellar = false;
P.lum_only = false;
```

```
P.sharpen_stars = 0.22;
P.adjust_halos = -0.50;
P.nonstellar_psf_diameter = 0.00;
P.auto_nonstellar_psf = true;
P.sharpen_nonstellar = 1.00;
```

- **Full Final Stretch**
- `HT Transformation`
- *_0002_SPCC_NXBX.xisf **>** *_0002_SPCC_NXBX_Full.xisf

5. Plate Solve and Camera Results:

ASIAIR plate solve:

- RA:1h35m11s
- DEC:+30°46'47
- Camera Angle = 155.914
- Star number = 232

6. Main logfile entries

2022/10/29 22:27:22 Plan M33 Start
2022/10/29 23:30:44 Solve succeeded: RA:1h35m11s DEC:+30°46'47" Angle = 155.914, Star number = 232
2022/10/29 23:32:46 [AutoFocus|End] Auto focus succeeded
2022/10/29 23:32:48 [Guide] ReSelect Guide star
2022/10/29 23:32:53 [Guide] Guide Settle
2022/10/29 23:33:52 Exposure 300.0s image 1#
…
2022/10/30 00:41:09 Exposure 300.0s image 14#
2022/10/30 00:42:29 [Guide] Guide star lost (several time due to fog)
2022/10/30 00:46:10 Exposure 300.0s image 15#
2022/10/30 00:46:25 [Guide] Guide star lost (several time due to fog)
2022/10/30 00:52:12 Exposure 300.0s image 16#
2022/10/30 00:54:10 [Guide] Guide star lost (several time due to fog)
2022/10/30 01:07:15 Stop Tracking
2022/10/30 01:07:15 [Guide] Stop Tracking failed
2022/10/30 01:07:15 Stop Tracking
2022/10/30 01:07:15 [Guide] Stop Tracking failed
2022/10/30 01:07:15 [Meridian Flip|Begin] Wait 8min17s to Meridian Flip
2022/10/30 01:15:32 Meridian Flip 1# Start
2022/10/30 01:15:32 [AutoCenter|Begin] Auto-Center 1#
2022/10/30 01:15:32 Mount slews to target position: RA:1h35m9s DEC:+30°46'28"
2022/10/30 01:16:25 Exposure 10.0s
2022/10/30 01:16:36 Plate Solve
2022/10/30 01:17:09 Solve succeeded: RA:1h35m11s DEC:+30°46'8" Angle = -24.5201, Star number = 158
2022/10/30 01:17:09 [AutoCenter|End] The target is centered
2022/10/30 01:17:09 [Meridian Flip|End] Meridian Flip succeeded
2022/10/30 01:17:09 Start Tracking
2022/10/30 01:17:14 [AutoFocus|Begin] Run AF after Auto Meridian filpped, exposure 2.0s Bin1, temperature 18.4°C
2022/10/30 01:19:07 [AutoFocus|End] Auto focus succeeded
2022/10/30 01:22:06 [Guide] Calibrate Success
2022/10/30 01:23:06 Exposure 300.0s image 19#
2022/10/30 01:28:07 Exposure 300.0s image 20#
2022/10/30 01:33:08 [Guide] Dither
2022/10/30 01:34:11 Exposure 300.0s image 21#
2022/10/30 01:39:12 Exposure 300.0s image 22#
2022/10/30 01:44:13 Exposure 300.0s image 23#
2022/10/30 01:49:15 Exposure 300.0s image 24#

2022/10/30 01:49:23 [Guide] Guide star lost (several time due to fog)
2022/10/30 01:59:17 Exposure 300.0s image 26#
2022/10/30 01:59:21 [Guide] ReSelect Guide star
2022/10/30 02:04:18 Exposure 300.0s image 27#
. . .
2022/10/30 04:55:59 Exposure 300.0s image 60#
2022/10/30 05:01:00 [Guide] Stop Guiding
2022/10/30 05:01:00 [Autorun|End] Finish Autorun
2022/10/30 05:01:00 Plan M33 Finish
2022/10/30 05:01:00 Turn Off Cooling
2022/10/30 05:01:23 Mount GoTo Home POS
2022/10/30 05:01:23 Stop Tracking
2022/10/30 05:02:20 EAF back to zero position
2022/10/30 05:02:20 Shutdown ASIAIR
Log disabled at 2022/10/30 05:02:20