

ObservationReport

ObservationID

315

on 2023-11-19 20:04

Object

Common Name Heart + Soul Nebula
Alternate Name IC1805, IC1848, LBN667
Visual Magnitude 6,5
Distance ► Object 7.500 ly
Apparent Size 4.38° x 3.01°
Object R.A. 02h 44m 02.524s
Object DEC +61° 15' 29.691"
WikiLink <https://www.jpl.nasa.gov/images/pia13112-heart-and-soul>

Heart+Soul



20231120-060828_Heart+Soul_ZWOASI294_0003-02_WM.jpg

Link ► Picture [Heart+Soul_20231119](#)
Description Emission Nebulae
Constellation Cassiopeia

Picture Data

Work Status	Published	Quality	*****
Format	Photo	Picture Center R.A.	02h 44m 02.715s
Tot./Act. Frames/Pane	20 20	Picture Center DEC	+61° 15' 31.230"
H / V Panes	3 3	H/V FoV [°]	5,4804 3,7303
Exp. [s] / Frame	180	Above horizon [°]	0
Total Time / Pane [min]	540,00 60,00	View Direction	N

Camera Data

Camera Data	ZWO	ASI294MC-Pro	ZWOASI294
Camera Angle [°]	5	Pixel Pitch [µm]	4,63
Gain or ISO	120	Camera Temp. °C	-10

Observation Data

Observation Start	2023-11-19T20:04:08 UTC+/- +h	Observation End	2023-11-20T06:08:28
Observation Site	ES La Palma Jardin	Site Elevation /Bortle	470 3
Province	La Palma	Site Coordinates	28° 38' 52.0" N, 017° 53' 47.

Sky & Moon

Sky Quality	0,68	Outside Temp. °C	21
Seeing Index 1	5	Seeing Index 2	3
Moon Phase	1st quarter	Moon Age [d]	7,3
Moon Percent %	39	Distance ► Target	UNKNOWN
MoonRise	13:03:00	MoonSet	00:15:00

Optical Config.

Optical Config.	TS600AS294	TS600AS294E100T78	
Lens or Scope	TS600	FocalLength [mm]	599
Type Of Build	APO Triplet Refractor	Diameter [mm]	90
Brand	TS-Optics	Aperture / f-stop	6,66
Additional Optics	M63 WO Rotator	DawesLimitLink	1,74 Arcsec
Filter	Optolong 2" L-eNhanche	Optical Scale ["/px]	1,595
Focuser	TS600 Rack + Pinion	EAF Position	20776
Focuser Position	64,39		

Other Hardware & Software

GuideScope	ZWO 30/120 mini	Mount	EQ6R-PRO
GuiderHW	ASIAIR	SessionControl	ASIAIR
GuiderSW	ASIAIR	PostProcessingSW	PixInsight, LR, PS

More ...

Work Folder [2023\20231119-200408_Heart+Soul_La-Palma-Jardin](#)
Comment Measured image properties: size: 4.38 x 3.01 deg, Radius: 2.655 deg
Remarks [1. Session Planning](#)

Despite the relatively poor weather forecasts, the recording was started to investigate the

difference between a recording without a filter (session from Nov. 17th, 2023) and one with the Optolong 2" L-eNhanse (this session).

The mosaic session was planned using ASIAIR Preview for camera rotation and SkyAtlas.

The mosaic consists of 9 panes, each containing 20 frames of 20x 180 seconds => 60 minutes per pane.

```
+-----+-----+-----+
| Pane 3-3 | Pane 3-2 | Pane 3-1 |
+-----+-----+-----+
| Pane 2-3 | Pane 2-2 | Pane 2-1 |
+-----+-----+-----+
| Pane 1-3 | Pane 1-2 | Pane 1-1 |
+-----+-----+-----+
```

2. Location and sky

All light frames were taken on La Palma (Canary Islands, Spain) at about 500 meters above sea level.

The sky index was 3.9 (acceptable), but the cloud cover changed up to 100% during the 9 hour recording session.

3. Session Results

The capture took about 9 hours in one night, starting at 20:04h in the evening and ending at 06:08h the next morning.

4. Plate Solving and Camera Rotation Results

ASIAIR SkyAtlas planned rotation: **5,3°**

ASIAIR Plate Solve result after GoTo: **185,3°**

Astrometry.net rotation measurement: **Up is 185.0 degrees E of N**

5. Post Processing

Post processing in PixInsight (PI):

- **Step 1:** created subfolders `..\work\work1-1` to `..\work\work3-3` for the post processing steps in PI
- **Step 2: PI WBPP** (weighted batch post processing) on each pane (pane 1-1 thought pane 3-3) in the subfolders of step 1 for image selection, registration, debayering and integration to create master light frames like **masterLight_BIN-1_4144x2822_EXPOSURE-180.00s_FILTERNoFilter_RGB.xisf**.
 - **WBPP Issues:**
 - Pane2-2: only 12 of 20 light frames used due to bad sky quality
 - All panes: LOCAL NORMALIZATION Error: Unable to determine the local normalization reference frame. Local normalization will be skipped for this group.
- **Step 3:** rename the resulting master light frames to include the pane number, e.g. **masterLight_1-1_BIN-1_4144x2822_EXPOSURE-180.00s_FILTER-NoFilter_RGB.xisf**
- **Step 4: applied PCC (Photometric Color Correction)** on each of the master files
- **Step 5: Post Processing:** many more steps in PixInsight to calibrate the strongly varying quality of the the different panes using more **PixInsight** processes like **ABE, BN, MLT, SCNR** etc.:
 - **Pane 1-1:** PCC + SCNR + ABE + MLT + Full Stretch
 - => `20231120-060828_Heart+Soul_ZWOASI294_0001_1-1_FULL.xisf`
 - **Pane 1-2:** PCC + SCNR + ABE + MLT + Full Stretch
 - => `20231120-060828_Heart+Soul_ZWOASI294_0001_1-2_FULL.xisf`
 - **Pane 1-3:** PCC + ABE + MLT + Full Stretch
 - => `20231120-060828_Heart+Soul_ZWOASI294_0001_1-3_FULL.xisf`
 - **Pane 2-1:** BCC + BN + SCNR + CT + Rotate 180° + Full Stretch
 - => `20231120-060828_Heart+Soul_ZWOASI294_0001_2-1_FULL_V2_ROTATE_CT.xisf`
 - **Pane 2-2:** PCC + MLT + Full Stretch + Rotate 180°:
 - => `20231120-060828_Heart+Soul_ZWOASI294_0001_2-2_FULL_ROTATE_CROPPED.xisf`
 - **Pane 2-3:** PCC + BN(Rescale as needed) + SCNR + BN(Target) + Rotate 180° + Full

Stretch

- => masterLight_BIN-1_4144x2822_EXPOSURE-180.00s_FILTER-NoFilter_RGB_autocrop_PCC_BN_SCNR_BN(Target)_ROTATE_FULL
- **Pane 3-1:** PCC + MLT + SCNR + Full Stretch + Rotate 180°:
 - => 20231120-060828_Heart+Soul_ZWOASI294_0001_3-1_FULL_ROTATE.xisf
- **Pane 3-2:** PCC + MLT + SCNR + Full Stretch + Rotate 180°:
 - => 20231120-060828_Heart+Soul_ZWOASI294_0001_3-2_FULL_ROTATE.xisf
- **Pane 3-3:** PCC + ABE +SCNR (Blue) + Rotate 180°
 - => 20231120-060828_Heart+Soul_ZWOASI294_0001_3-3_FULL_BLUE_ROTATE.xisf
- **Mosaic intergration:**
 - was repeated 3 times to optain optimal results, but the option Frame Adaption returned some strange results and was not used. Latest mosaic integration steps (version 0003): intergration sequence was unfortunately not documented but started in the middle with pane 2-2
 - Final mosaic integration image is [20231120_060828_Heart_Soul_ZWOASI294_0003_mosaic.xisf](#)
- **Post Processing in Photoshop:**
 - In order to neutralize the clearly visible transitions between the individual panes, the next step was to use Photoshop, essentially with the tone correction function using the Polygon Selection tool and New Layer > Tone Correction to create the image version **0003-02**.
 - No color or hue changes have been applied; the final image is showing natural but enhanced colors.
 - The final image 0003-02 was rotated by 180° in the last step.
 -

6. Lessons Learned

- The selected overlap of 20% between the panes was a bit too high, 15% should be sufficient.
- The Optolong 2" L-eNhanse is well worth the price
- In order to get good results from the automatic mosaic integration using the Frame Adaption option in PixInsight, better calibrate images are required. Unfortunately this was not possible due to the varying sky conditions during the acquisition pase. Frame Adaption failed completely for most of the mosaic integration steps.

7. Main logfile entries

```
Log enabled at 2023/11/19 19:53:58
2023/11/19 19:53:58 Plan Heart-Soul Start
2023/11/19 19:53:58 [Autorun|Begin] IC1805_1-1 Start
2023/11/19 19:53:58 [Guide] Stop Guiding
2023/11/19 19:53:59 [AutoCenter|Begin] Auto-Center 1#
2023/11/19 19:53:59 Mount slews to target position: RA:2h35m44s
DEC:+60°13'26"
2023/11/19 19:54:13 Exposure 2.0s
2023/11/19 19:54:16 Plate Solve
2023/11/19 19:54:17 Solve succeeded: RA:2h35m58s DEC:+60°17'5"
Angle = 173.332, Star number = 312
2023/11/19 19:54:18 [AutoCenter|End] Too far from center,
distance = 5%(0.0675846°)
2023/11/19 19:54:20 [AutoCenter|Begin] Auto-Center 2#
2023/11/19 19:54:20 Mount slews to target position: RA:2h35m44s
DEC:+60°13'26"
2023/11/19 19:54:31 Exposure 2.0s
2023/11/19 19:54:33 Plate Solve
2023/11/19 19:54:35 Solve succeeded: RA:2h35m48s DEC:+60°12'23"
Angle = 173.501, Star number = 304
2023/11/19 19:54:35 [AutoCenter|End] The target is centered
...
2023/11/19 19:58:08 [AutoFocus|Begin] Run AF before Autorun
```

```

start, exposure 5.0s Bin1, temperature 20.7°C
...
2023/11/19 20:00:55 Auto focus succeeded, the focused position
is 20759
2023/11/19 20:00:55 [AutoFocus|End] Auto focus succeeded
...
2023/11/19 20:01:07 Exposure 180.0s image 1#
...
2023/11/19 21:04:31 Exposure 180.0s image 20#
...
2023/11/19 21:07:32 Mount slews to target position: RA:2h46m44s
DEC:+60°25'19"
...
2023/11/19 21:08:02 Solve succeeded: RA:2h46m46s DEC:+60°25'21"
Angle = 173.94, Star number = 217
2023/11/19 21:08:02 [AutoCenter|End] The target is centered
...
2023/11/19 21:10:54 Auto focus succeeded, the focused position
is 20745
2023/11/19 21:10:54 [AutoFocus|End] Auto focus succeeded
...
2023/11/19 21:11:07 Exposure 180.0s image 1#
...
2023/11/19 22:09:37 Exposure 180.0s image 20#
... and so on, then the trouble began with the poor visibility
and partial cloud cover
2023/11/19 23:23:29 [Guide] Guide star lost
2023/11/19 23:23:35 [Guide] ReSelect Guide star
2023/11/19 23:23:36 [Guide] Start Guiding
2023/11/19 23:24:31 [Guide] Guide star lost
2023/11/19 23:24:37 [Guide] ReSelect Guide star
2023/11/19 23:24:38 [Guide] Start Guiding
2023/11/19 23:25:10 Exposure 180.0s image 2#
...
2023/11/19 23:46:36 [Meridian Flip|Begin] Wait 6min27s to
Meridian Flip
2023/11/19 23:53:03 Meridian Flip 1# Start
2023/11/19 23:53:03 [AutoCenter|Begin] Auto-Center 1#
2023/11/19 23:53:03 Mount slews to target position: RA:2h34m27s
DEC:+61°8'53"
...
2023/11/19 23:54:23 [AutoFocus|Begin] Run AF after Auto
Meridian flipped, exposure 5.0s Bin1, temperature 20.1°C
...
2023/11/19 23:57:02 Auto focus succeeded, the focused position
is 20758
2023/11/19 23:57:02 [AutoFocus|End] Auto focus succeeded
...
2023/11/20 03:40:37 [Guide] Guide star lost
2023/11/20 03:40:43 [Guide] ReSelect Guide star
2023/11/20 03:40:44 [Guide] Start Guiding
2023/11/20 03:40:48 [Guide] Select Guide Star failed, no star
found
...
2023/11/20 03:53:33 [Guide] Start Guiding
2023/11/20 03:54:48 Exposure 180.0s image 20#
...
2023/11/20 06:05:27 Exposure 180.0s image 20#
2023/11/20 06:05:31 [Guide] Select Guide Star failed, no star
found
2023/11/20 06:05:42 [Guide] ReSelect Guide star
...
2023/11/20 06:08:17 [Guide] ReSelect Guide star
2023/11/20 06:08:17 [Guide] Start Guiding
2023/11/20 06:08:21 [Guide] Select Guide Star failed, no star

```

```
found
2023/11/20 06:08:28 [Autorun|End] Finish Autorun
2023/11/20 06:08:28 Plan Heart-Soul Finish
2023/11/20 06:08:28 Turn Off Cooling
2023/11/20 06:08:28 [Guide] Stop Looping
2023/11/20 06:08:28 Stop Tracking
2023/11/20 06:08:28 [Guide] Stop Tracking failed
2023/11/20 06:08:28 Stop Tracking
2023/11/20 06:08:28 [Guide] Stop Tracking failed
2023/11/20 06:08:45 Mount GoTo Home POS
2023/11/20 06:08:45 Stop Tracking
2023/11/20 06:08:45 [Guide] Stop Tracking failed
2023/11/20 06:08:45 Stop Tracking
2023/11/20 06:08:45 [Guide] Stop Tracking failed
2023/11/20 06:09:42 EAF back to zero position
2023/11/20 06:09:42 Shutdown ASIAIR
Log disabled at 2023/11/20 06:09:42
Log closed at 2023/11/20 06:09:43
```