

# ObservationReport

all measures in mm

ObservationID

0313

on

2023-11-17 20:07

**Object** Heart+Soul Nebula

Common Name Heart + Soul Nebula  
Alternate Name (s) 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>



20231117\_Heart-Soul-Nebula\_ASI294\_0313-05WM.jpg

Link ► Picture [Heart+Soul Nebula\\_20231](#)  
Description Emission Nebulae  
Constellation Cassiopeia

**Picture Data**

Work Status	Published	Quality	*****
Source Format	Photo	Picture Center R.A.	02h 42m 58.864s
Tot./Act. Frames/Pane	20 20	Picture Center DEC	+61° 11' 10.684"
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**

<b>ZWO</b>	<b>ASI294MC-Pro</b>	<b>ZWOASI294</b>	
Camera Angle [°]	0	Pixel Pitch [µm]	4,63
Gain or ISO	120	Camera Temp. °C	-10

**Observation Site**

Observation Start	2023-11-17T20:07:16 UTC+/- +h	Observation End	2023-11-18T05:48:10
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 0 %	Moon Rise   Set	11:46:00 21:59:00
Outside Temp. °C	23	Moon Age [d]	3
Moon Phase  % Illum.	1st quarter 15 %	Moon ► Target Dist.	UNKNOWN

**Optical Configuration**

<b>TS600AS294</b>	<b>TS600ASI294T252</b>		
Lens or Scope	TSO APO 90/600	Focuser	M90 TS600 Rack + Pinion
Type Of Build	APO Triplet Refractor	Focuser Position [mm]	59,58 EAF Steps 20542
Brand	TS-Optics	Optical Factor	1
Additional Optics	M63 WO Rotator	FoL norm actual [mm]	599
Filter	-	<a href="#">DawesLimitLink</a>	1,74 Arcsec
Diameter [mm]	90	Optical Scale ["/px]	1,595
Aperture / f-stop	6,66		

**Other Hardware & Software**

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

**More ...**

Work Folder [2023\20231117\\_Heart-Soul-Nebula\\_0313\\_La-Palma-Jardin](#)  
Comment Measure image properties: 4.99 x 3.32 deg, radius: 2.996 deg, Up is 177.0 degrees E of N by Astrometry.net  
Remarks **1. Session Planning**  
The mosaic session was planned using ASIAR 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 1-1	Pane 1-2	Pane 1-3
+	-----+	-----+	-----+
	Pane 2-1	Pane 2-2	Pane 2-3
+	-----+	-----+	-----+
	Pane 3-1	Pane 3-2	Pane 3-3
+	-----+	-----+	-----+

## 2. Location and sky

All light frames were taken on La Palma (Canary Islands, Spain) at about 500 meters above sea level, sky index was 4.5 (really good) and 0% clouds.

## 3. Session Results

The capture took about 9 hours in one night, starting at 20:07:16 in the evening and ending at 05:48:10 the next morning.

## 4. Plate Solving and Camera Rotation Results

**ASI AIR rotation planning in SkyAtlas: 179.2°** at the first pane

**Astrometry.net** measurement: final cropped picture details: 4.99 x 3.32 deg, radius: 2.996 deg, Up is **177.0** degrees E of N, Center (RA, hms):02h 42m 58.864s, Center (Dec, dms):+61° 11' 10.684"

## 5. Post Processing

Post processing in PixInsight:

- Step 1: created subfolders `..\work\work1-1` to `..\work\work3-3` for the post processing steps in PI
- Step 2: **WBPP (weighted batch post processing)** on each pane (pane 1-1 through 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_FILTER-NoFilter_RGB.xisf`
- Step 3: rename the 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: applied **SCNR** to de-green the master light frames, resulting file names like: `masterLight_1-1_BIN-1_4144x2822_EXPOSURE-180.00s_FILTER-NoFilter_RGB_PCC_SCNR.xisf`
- Step 6: **StarIntegration** started. Unfortunately a one-step integration attempt to integrate all panes at once failed completely, so the panes were therefore integrated pane by pane:
  - Step 6.1: integrated pane 1-1 (rotated by 180°) and pane 2-1 => mosaic 11\_21
  - Step 6.2: integrated pane 11\_21 and pane 2-2 => mosaic 11\_21\_22
  - Step 6.3: and so on until...
  - Step 6.9: final integration of pane 3-3 into mosaic 11\_21\_22\_12\_31\_23\_32 => `masterLight_BIN_1_4144x2822_EXPOSURE_180_00s_FILTER_NoFilter_RGB_PCC_SCNR_mosaic_3x3.xisf`
  - **NOTE:** The **star integration** only worked with previews on the overlapping image section, otherwise the integration sometimes failed.
- Step 7: Performed dynamic cropping by rotating and cropping the light frame to cut off all unused parts of the image.
- Step 8: **ABE (Automatic Background Extraction)** performed
- Step 9: **ML (Multiscale Linear Transform)** performed on both luminance and chrominance
- Step 10: created a fully stretched final picture using **Screen Transfer Function (STF)** and **Histogram Transfer (HT)** and saved the resulting image as:
  - 20231117-200716\_Heart+Soul\_ZWOASI294\_0002\_FULL.xisf and
  - 20231117-200716\_Heart+Soul\_ZWOASI294\_0002\_FULL.jpg
- Step 11: applied **selective color boost** in Photoshop to bring out the faint nebulae
- Step 12: imported the final `20231117-200716_Heart+Soul_ZWOASI294_0002-01.jpg` into Lightroom Classic and added tags
- Step 13: ran the image through **StarlustDB**, **ThumbsPlus** and **FotoManager** for final

tagging and resizing

No color or hue changes have been applied; the final image is showing natural colors.

#### 6. Lessons Learned

- The chosen pane overlap of 10% was almost too small, had the target been further away from the ecliptic, the small overlap would have resulted in image gaps.
- Also, a **meridian flip** occurred between horizontal panes 1 and (2 and 3), mosaic integration failed initially until the affected images were rotated 180°, losing all astrometric data.

#### 7. Main logfile entries

see log file Autorun\_Log\_2023-11-17\_193251.txt in work folder [..\\\_Astro\Observations\2023\20231117-200716\\_Heart+Soul\\_La-Palma-Jardin\logs](#)