How to use Astro Panel" 5

English
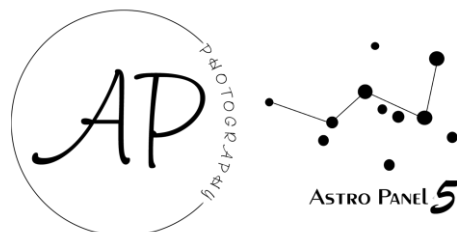
Angelo Perrone

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Introduction

Welcome to the guide for the Adobe Photoshop CC plug-in **"Astro Panel"** version 5.0. This plug-in has advanced features to drastically reduce the workflow of the amateur photographer, the professional photographer and the video maker in a matter of minutes. The workflow illustrated in this guide together with the description of the functions will help you to reach high quality digital processing. The functions integrated inside the panel will guide the user during the digital processing process because they are arranged in chronological order to instruct him in a correct digital post-production method. Astro Panel now integrates the advanced features of Fusion.

"Astro Panel" is entirely in HTML5 and was created in collaboration with qualified expert personnel to maximize the experience of use and make the integrated functions fantastic.

"Astro Panel" is not compatible with the versions of Photoshop CS, but only from the CC 2015 version up to the current CC 2020. The compatibility with the CC version of Photoshop is used to guarantee excellent performance and continuous updates. To take full advantage of the plug-in's features, I recommend you always update Adobe Photoshop CC to the latest version available.

Let's move on to installing the plug-in in our PC / MAC.

How to Install?

To install the Panel on your PC you can use Anastasiy Extension Manager. We need to download the **Anastasiy Extension Manager** from the website https://install.anastasiy.com and perform these simple steps:
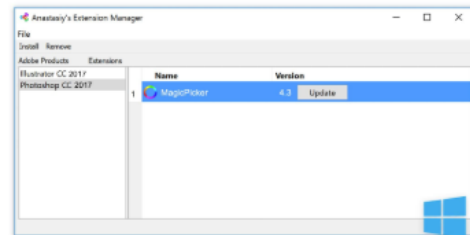
- Select your **operating system** from the page;
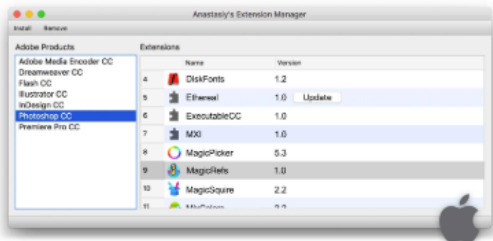
Download v3.0 for Mac OS X 10.8+

NEW: Now supports Adobe XD plugins; Improved compatibility with most recent Adobe Creative Cloud; Fixed crash when no Photoshop CC was installed prior to Extension Manager run; Various UI fixes and improvements;

version history

Download v3.0 for Windows 7+

NEW: Now supports Adobe XD plugins; Improved compatibility with most recent Adobe Creative Cloud; Fixed crash when no Photoshop CC was installed prior to Extension Manager run; Various UI fixes and improvements;

version history

- save the Zip **ExtensionManager_win.zip** in a folder;

- **Extract** the files into a folder;

- run the **ExtensionManager** file contained in the compressed package;

- from the list of Adobe applications select **Photoshop CC** and then **INSTALL**;
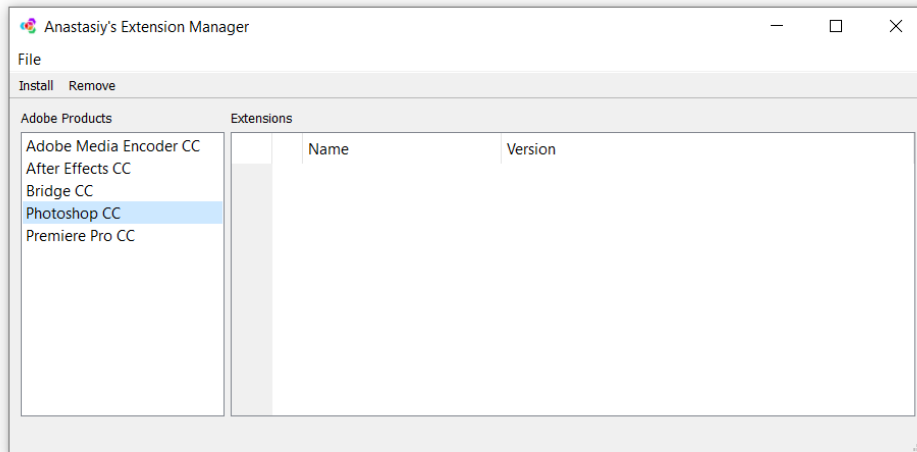
- extract the panel files in a folder on your PC, select

"*it.angeloperrone.astropanel.v5.zxp*"
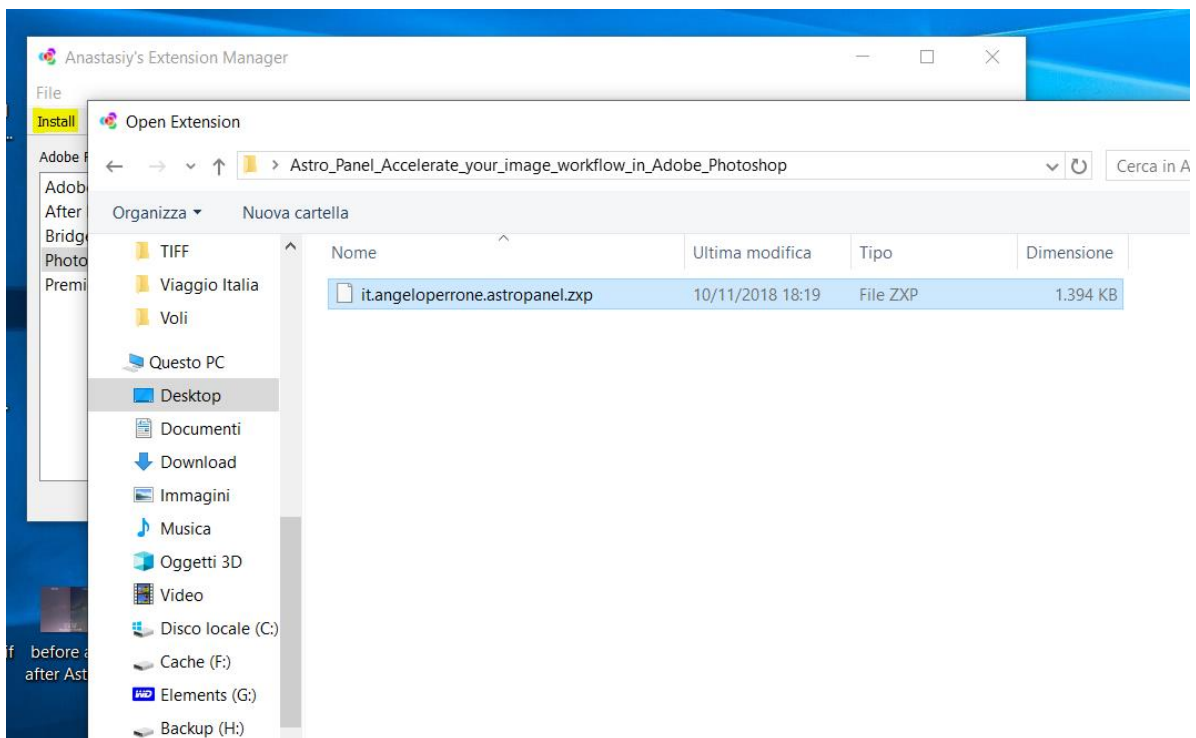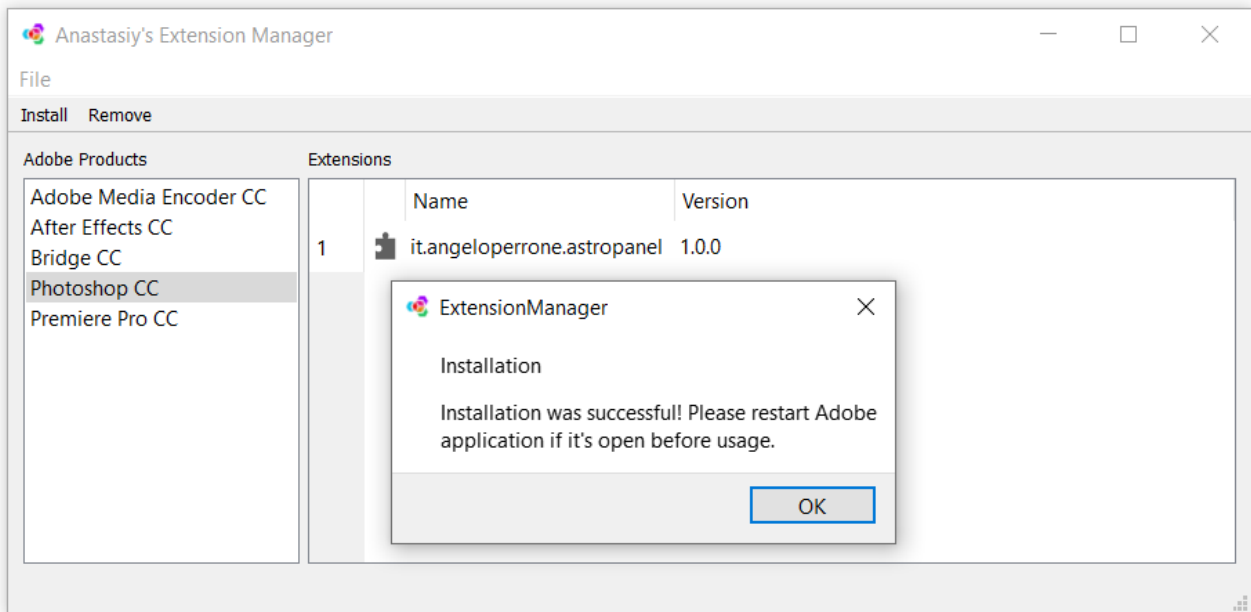
Once the package is installed on your PC, from Adobe Photoshop CC open the menu "Window" -> "Extensions" and click on "Astro Panel 5".

If you are upgrading from old version to 5.0, you will have to **uninstall** the old version and install the new one again using the **Anastasiy extension manager** using the **"Remove"** command.
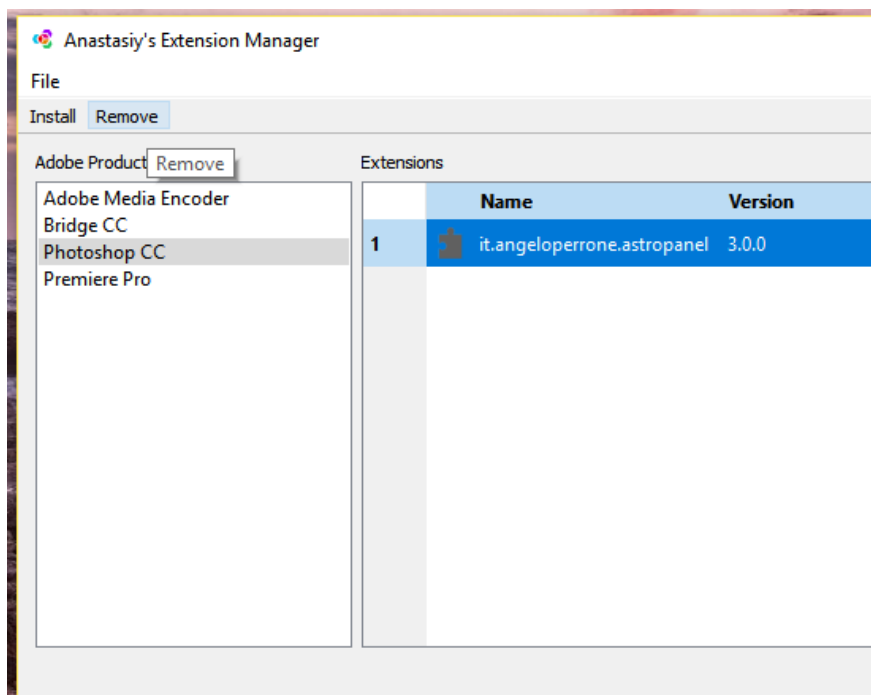
Here is the video installation tutorial:

https://www.youtube.com/watch?v=426V8ULLbPA&t=169s

If you have problems installing Astro Panel try to perform a manual installation.

Open the file you downloaded from the Astro Panel website and copy only the folder named **it.angeloperrone.astropanel** contained in the **"Manual Installation"** folder in one of these folders, depending on the operating system:

Win: C: Program Files (x86) Common Files CEP extensions

Mac: / Library / Application Support / Adobe / CEP / extensions

After this, open Adobe Photoshop CC and verify that the panel is present on the Window -> Extensions.

The Plug-in

With the latest update, many new features have been introduced regarding the experience of using Astro Panel. Once started in we will find four main sections with the relative dedicated functions:

- The "**LANDSCAPE**" section dedicated to the post-production of the images has been completely renewed. Now the functions integrated in this tab adapt to any type of photography. You will be able to process white balance and color tone with one click, remove digital noise and annoying hot pixels, increase image sharpness, recover shadows and highlights, and handle many effects such as Orton and Glow;

- The "**ASTRO**" section is dedicated to the post-production of astronomical images. The Astro section has been redesigned with the addition of new features and simplified to accelerate the workflow of astronomical images (milky way, startrail and deep sky);

- The "**EXPORT**" section integrates the tab for resizing images for the web, for saving files and for printing;

- With the latest update, the "**FUSION**" section has integrated a new "**Deep Sky**" tab with which file sessions by channel and color can be added.

The brightness, color and hue masks have been moved down to be available whenever you need them during your workflow. This section also integrates the advanced selection of luminosity masks in real time via the eyedropper positioned on the right. There are also sliders for controlling Adobe Photoshop layer masks.

The image above shows all the sections of the update to version 5.0.

Let's illustrate the various functions of "**Astro Panel**" section by section.

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The LANDSCAPE Section

The PRO section has been completely revised to contain all the new Astro Panel functions. From this section we can modify any type of photography, from astrophotography to the daytime landscape.
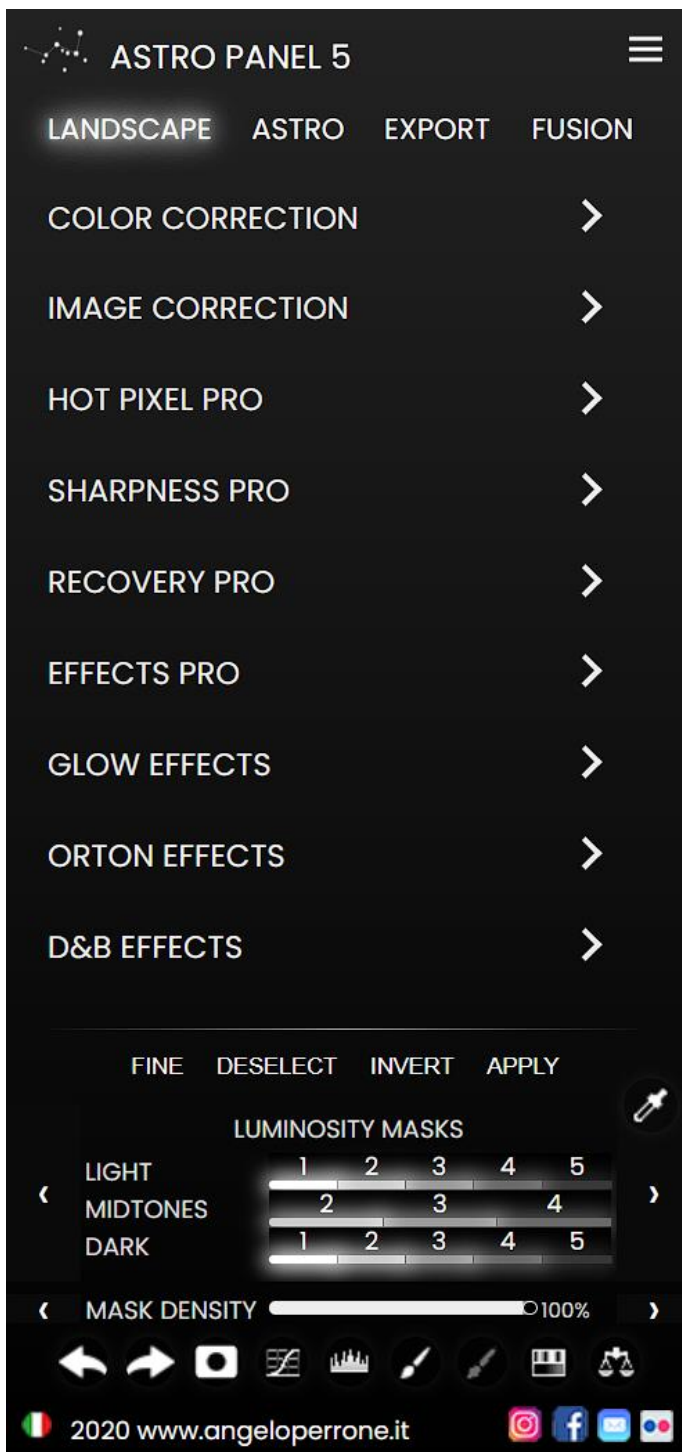
We describe the commands of this section one by one.

COLOR CORRECTION, are controls for color correction, white balance and color saturation, precisely:

- **COLOR**, adjusts the automatic color corrections of the image;

- **TONE**, adjusts automatic corrections of image tones;

- **BALANCE**, find the average neutral color of an image and adjust the values of the range (half tones) according to this neutral color;

- **LAB**, increases the vividness of colors in Color Lab.

The **IMAGE CORRECTION** commands are for correcting artefacts and defects that affect all digital images:

- **REDUCE NOISE**: helps the user to reduce the chromatic noise present in the photo without losing details and maintaining the nuclei of the nebulae and the brightness of the stars;

- **REMOVE HAZE:** removes the haze present in the photo and can be adjusted through the opacity of the layer;

- **ABERRATION**: analyses chromatic aberrations and with the brush the user can remove the aberrations present in the image;

- **BANDING**: banding or scaling is the phenomenon in which the shades of colours in an image are rendered as bands of colours. This function easily removes these defects.

HOT PIXEL is a set of functions to automatically remove "Hot Pixels": those annoying white or coloured pixels that typically appear when taking pictures in low light and with long exposure times. Click on one of the coloured buttons to increase the intensity of the function.

SHARPNESS is a group of semi-automatic functions that increase image sharpness. Let's analyze the commands:

- **BOOST**: this very useful function in daytime images increases sharpness by using brightness masks (highlights and shadows);
- The **HIGH PASS** filter works on the contrast of the edges of the objects and you can adjust the ideal radius during post-production. I advise you to use it with caution in order not to exaggerate with the sharpness;
- **SUPER SHARP** uses the "Advanced Sharpness" filter adjustable during post-production and exercises greater control over the sharpness of the images;
- **LAB PRO** increases the sharpness of the image on the "Luminosity" channel working in Color LAB.

RECOVERY is a set of automatic functions to recover lights and shadows in a single click. Click on 1 or 2 to choose the ideal intensity for your photo.

EFFECTS , as the word itself says, adds effects to our images to improve the final result or give that touch that is missing. We find:

- **CONTRAST** selectively increases micro-contrast in the photo;
- **VIGNETTE** adds vignetting and it is adjustable at will;
- **EXPOSURE** adjusts the final exposure of the photo and it is useful before publication on the Web or the printing phase.
- **FALL COLORS**, transform the photo with autumn colors;
- **DARK MOOD**, darkens the image;

- **NIGHT**, transform the photo from day to night;

GLOW EFFECTS, contains four adjustments to create the final Glow effect on your photo. You can choose between:

- **SOFT**: to create a light Glow effect;
- **- PRO,** creates a professional and freely adjustable Glow effect with the channel mixer;
- **NIGHT**: to create a Glow effect suitable for night images.

ORTON EFFECTS contains four adjustments to create the final Orton effect on your photo. You can choose between:

- **BASIC**: to create a light Orton effect;

- **PRO,** creates a professional and freely adjustable Orton effect with the channel mixer;

- **MAGIC**, creates a fairy tale Orton effect;

D&B EFFECTS, the Dodge and Burn, is a photographic technique entirely dedicated to light management. Through these functions you can "dodge and burn" your image. We have two different functions:

- **D&B - SIMPLE** gives us the possibility to intervene on the dodge and burn using a black / white brush to obtain the desired effect;
- **D&B PRO** automatically creates an aggressive dodge and burn working on the light masks and can be adjusted at the end.

The ASTRO Section

The Astro section has been completely revised and now contains many more features than the previous version.

We list all the functions in detail.
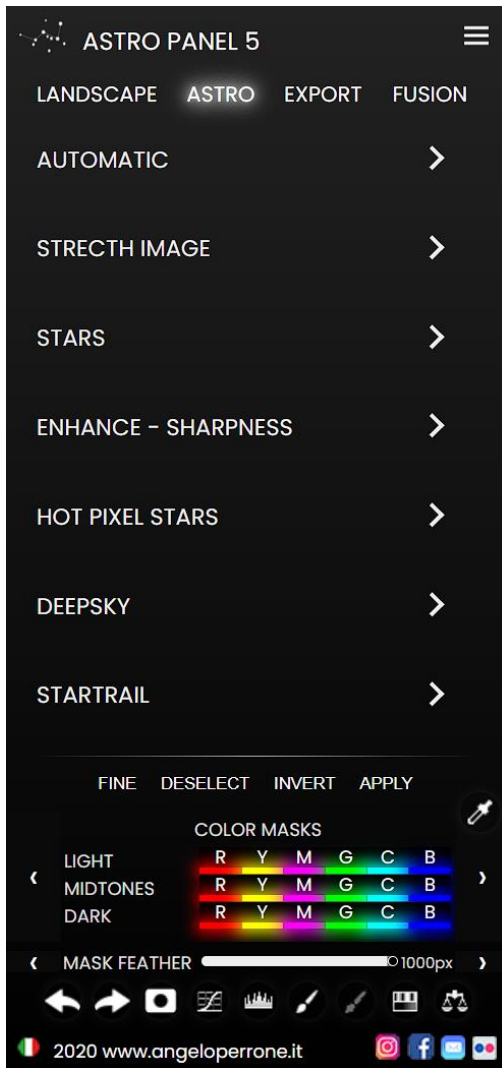
AUTOMATIC PROCESS: this group contains two automatic functions that transform your astronomical photo in just one click. Two functions are available:

- **UNDEREXPOSURE** - Automatic process Dark Images, (for underexposed or dark images);

- **OVEREXPOSURE** - Automatic process Bright Images, (for images with correct exposure).
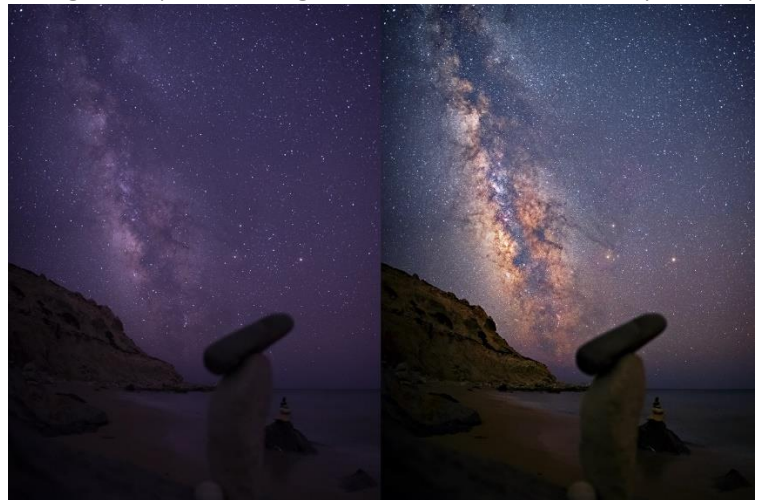
Automatic process example (Automatic process Dark Images).

STRECHING IMAGE is a group composed of two commands that serves to extrapolate the hidden signal of the Milky Way / Deep Sky contained in the photo; there are two methods of extrapolation based on the exposure of the photo (bright or dark image) **UNDER**, fir underexposed images, and **OVER**, for overexposed images. Moreover, we have the **DYNAMIC** (Dynamic Strech) mode, which amplifies the Milky Way signal or deep sky objects.

Example of Dynamic Strecth

STARS, there are three groups of functions that do different work on the stars. They are used mostly in Deep Sky images to highlight deep sky objects and turn off the brightness of stars.

With the **SELECT STARS** group we can select stars based on their size.

With **STAR TOOLS** we can make some particular changes such as:

- **FILTER - Star Filter**: with it, you can filter the stars contained in the image and in small percentage turn them off in order to emphasize the nebulae. You can use this function as many times as you need to filter as many stars as possible;
- **FADE** - **Feather Stars**: blurs the sharpest images to bring out the colors of the stars;
- **VIVID - Saturate Color Stars**: it increases the vividness and saturation of stars;
- **REDUCE** - **Reduce Stars Diameter**: it reduces the diameter and makes the stars in the image point-like;
- **REMOVE - Remove all Stars** eliminates all the stars from the image leaving all the nebulosity of the objects of the deep free sky.
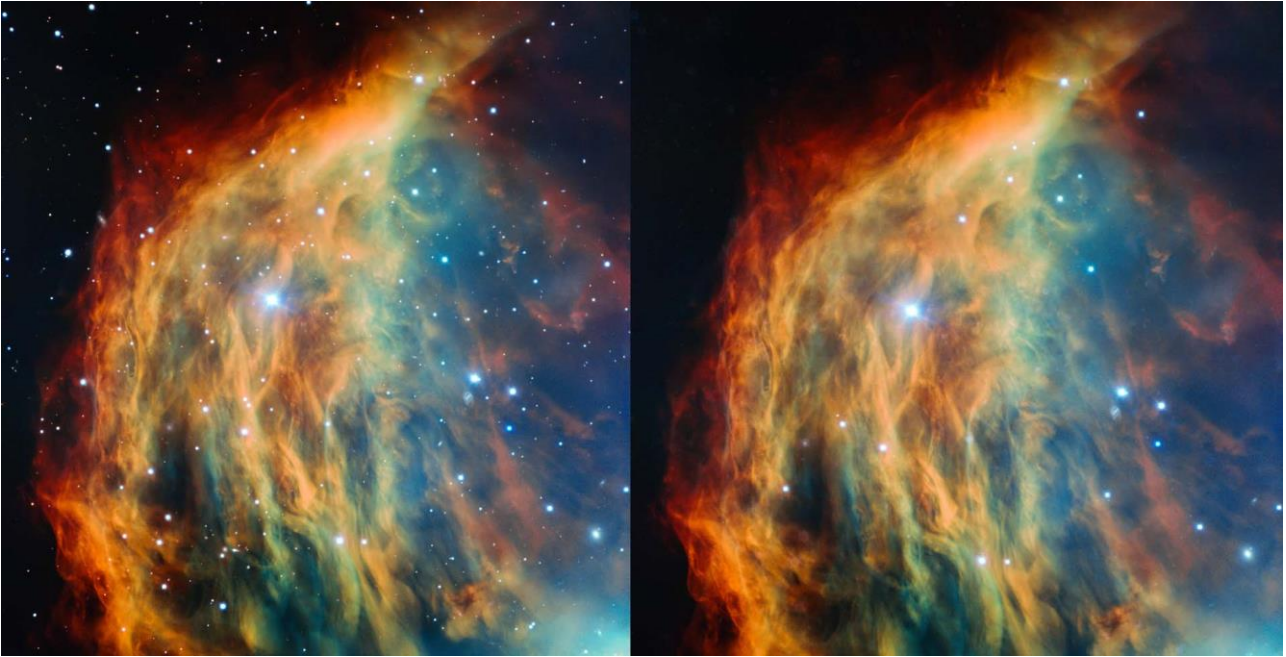
Example of Remove Stars (Stars have been partially removed to emphasize nebulosity).

With the **STAR SPIKES group** we can create tips to the stars artificially.

Esempio di Star Spikes Large (Vengono aggiunti gli spikes solo alle stelle più grandi).

ENHANCE-SHARPNESS is a set of commands used in astrophotography. Let's analyze:

- **NEBULA - Enhance NEBULOSITY** amplifies the nebulosity of the Milky Way or deep sky objects, reducing the diameter of the stars;
- **BOOST - Precision Boost** allows to increase the sharpness of the photo in a controlled way. It is advisable to use the white brush on the black level mask to increase the effect of the chosen command;
- **AUTOBOOST - Automatic Precision Boost** increases the sharpness of the photo automatically;
- **EXTREME – Deconvulation**: is a technique used in astrophotography that serves to give a hyper-sharpness to our photos. Adjust the opacity of the layer to your liking.

Example of combining "Nebula" and "Boost"

HOT PIXEL STARS, this set of functions automatically removes even the "Hot Pixels", those annoying white or colored pixels that typically appear when taking photos with little light and with long exposure times. Click on one of the colored keys to increase the intensity of the function.

DEEP SKY, contains three groups of functions designed specifically for deep sky images.

The first **is COLOR BALANCE,** a set of tools for color management. We can adjust the color temperature on the fly and correct the chromatic aberrations around the stars:

- **CAST - Remove Green color Cast,** removes the green dominant contained in astronomical photos automatically and you can adjust the opacity to your liking;
- **LAB,** saturated the image by 20% using the LAB color**method;**
- **RED – Selective Color Red,** brush the red color contained in the image;
- **GREEN – Selective Color Green,** brushes the green color contained in the image;
- **BLUE – Selective Color Blue,** brushes the blue color contained in the image;
- **PLUS – Saturate and Sharpen,** accentuates the saturation and sharpness of the Milky Way or deep sky objects;

The second group is **DEEP SKY,** a set of functions that enhance the image:

- **RELIEF,** highlights the details of the photo;
- **DETAILS,** accentuates the detail;
- **BLACK SKY,** makes the bottom of the image darker;
- **BOTTOM,** improves the bottom of the image;
- **FALSE Ha,** create a level He fake;
- **FALSE Oiii,** create a fake Oiii level;
- **HALOS,** eliminate the bright halos around the stars.

FALSE FLAT (REMOVE GRADIENT), the third group, automatically removes, in two steps, the "unpleasant" gradient that we find in our astronomical photos. There are 3 commands that differ from each other based on the amount of gradient we want to remove. We don't need external software to do this because it's all integrated into "Astro Panel".

Example of False Flat 50% (press "1" and then the 50% button).

Example of color and detail correction in lights and shadows

The last section concerns some functions explicitly designed for images with **STARTRAILs.** In this section you can remove the moiré from the images, make your skis fluid or saturate the color of the images.

In the **TONALITY** section you can adjust at will which shade fits your image.

The EXPORT Section

The EXPORT section has also been completely redesigned and now contains many more features than the previous version.

We list all the functions in detail. We have the **ability to resize** images at will for both local saving, printing or web. In addition, we also find a convenient function to add the **watermark to** our image before posting on social media.

Another new feature of the new update is the ability to **resize images** as desired either for saving locally, for printing or for the web. In addition we also find a convenient function to add the **watermark** to our image before posting on social media.

Other convenient features that immediately catch the eye are the quick adjustments. In fact we would no longer need to adjust the opacity of the layer, the nuance and density of the mask because we could do it directly from the panel below. Under these adjustments, the quick tools like **Forward** and **Back**, the **Quick White Mask, Curves** and **Levels**, **White Brush** and **Black Brush**, **Hue / Saturation** and **Color Balance** have been optimized compared to the previous version.

As for the management of masks At the bottom we have **luminosity masks, color masks** and tonal color masks **divided** by **Lights**, **Midtones** and **Shadows**.
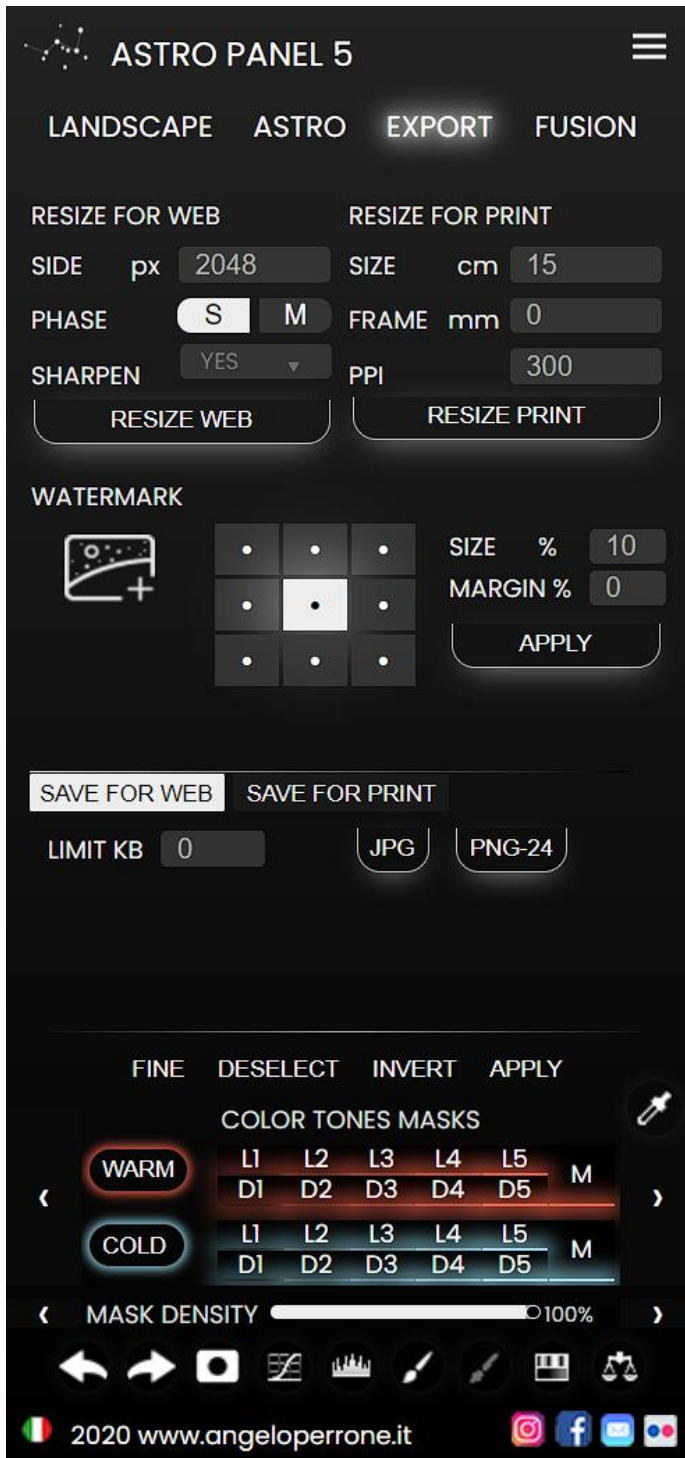
On the right we **have the dropper** that allows us to query any area of the image and in real time understand which brightness mask to use. In fact, one of the masks will light up in light blue.

Above the masks you will find some commands that will help you finish the masks:

- **END,** to finish the selection of mask with the Curves layer;
- **DESELECT**, to clear the selection (Ctrl+D);
- **INVERT,** to reverse the selection;
- **APPLY,** to confirm and paste the mask selection into our Photoshop layer.
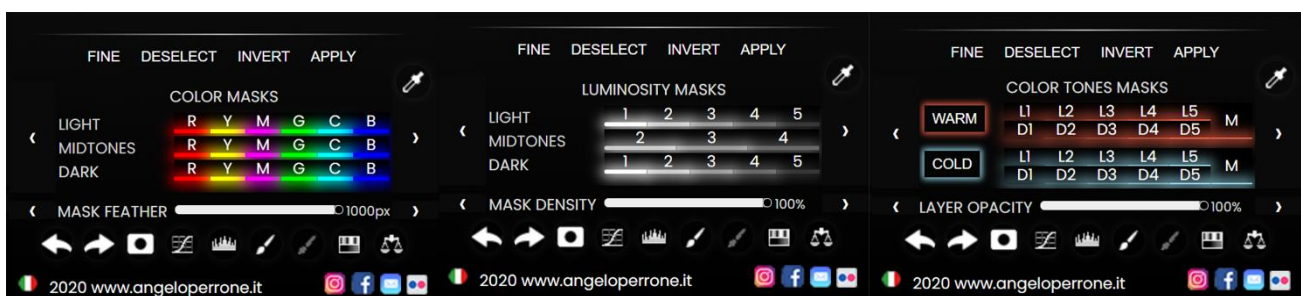
The FUSION Section

This tab is a concentrate of technology and a novelty for Astro Panel. Indeed, it integrates all the features of the Fusion plug-in reviewed and updated with new features. The Fusion tab is divided into four main sub-sections with the relative dedicated functions:

- The "**MERGE**" section contains the most common types of image fusion developed from scratch and with proprietary code to speed up image summing operations;

- The "**STARTRAIL**" section adds up to hundreds of images to obtain beautiful linear Startrails with particular effects on the stars;

 - The "**SKY STACK**" section allows you to sum up images of the Milky Way and the deep sky very quickly. You can insert light frames, dark, bias and flat fields;

- The "**SKY HDR**" section is one of the most advanced features of Fusion and blends up to 3 different exposures in one to achieve a dynamic range at night without equal;

- The "**DEEP SKY**" section allows you to add multiple channels to get the final color image we want.

Let's illustrate the various functions of the "**Fusion Section**" section by section.

The **MERGE** Section

The Merge section allows us to sum lots of images to create a beautiful "**SILK**" effect that can be obtained even without the use of ND filters. Not only that, you can blend images to achieve Focus Stacking, combine beautiful images in **Classic HDR** and **NIGHT HDR** (multi-exposure at night).
Here is the list of the description of the commands:
LOAD FILES: This button allows you to select the files to be merged to obtain the silk effect.

GENERIC ALIGNMENT: This switch activates the automatic alignment of the levels, the one accessible to all in the section Edit> Automatic level alignment, and automatically finds the alignment method. [Tip: when using this alignment method, it is recommended to also activate the lens correction for a better result]

TRIPOD ALIGNMENT: This switch does the exact same thing as the generic alignment switch, but as an alignment method it uses ''Reposition'' instead of ''Automatic''.

LENS CORRECTION: This function allows you to open files by applying the distortion and vignetting correction available within the Camera Raw plug-in.

CHROMATIC ABERRATION: With this function we can also activate the removal of chromatic aberrations, also available in the Camera Raw plug-in.

SILK: Clicking this button starts the fusion to create the desired silk effect.

FOCUS STACKING: Clicking this button starts the fusion to create the Focus Stacking. Focus Stacking is a digital photographic technique that involves performing a series of shots of the same frame, each on a different focusing plane in sequence, in order to obtain a final image with a depth of field greater than that obtainable with traditional techniques.

HDR and **NIGHT HDR**: HDR photos are used to capture scenes with a wide dynamic range. Click on the HDR button to add day images or NIGHT HDR for night images.

MEAN STACK to sum images of the same subject and obtain a single "clean" final image of color and digital noise.

The **STARTRAIL** Section

Here is the description of the commands:

LOAD FILES: This button allows you to select the files to be merged to get the startrail effect.

TRIPOD ALIGNMENT: This switch activates the automatic alignment of the levels, the one accessible to all in the section Edit> Automatic level alignment, and automatically finds the alignment method. [Tip: when using this alignment method, possibly also activate the lens correction for a better result]

COMET STAR EFFECT: This switch allows you to activate the fusion with the falling star effect.

ROTATION DIRECTION: This switch allows you to activate the fusion with the falling star effect.

LENS CORRECTION: This function allows you to open files by applying the distortion and vignetting correction available within the Camera Raw plugin.

CHROMATIC ABERRATION: With this function we can also activate the removal of chromatic aberrations, also available in the Camera Raw plugin.

BLEND: Clicking this button starts the merger, and at the end of it a message will appear that will show the time taken for the merging process of the shots.

The **SKY STACK** and **SKY HDR** Sections

Here is a list of the description of the commands:

LIGHT: This button allows you to select the light files to be merged.

DARK: This button allows you to select the dark files to be merged.

BIAS: This button allows you to select the bias files to be merged.

FLAT: This button allows you to select the flat files to be merged.

While the last three may or may not be selected, the light files must always be selected.

ALIGNMENT: With this switch you can activate the alignment of the levels, and it's the one available on Photoshop in File> Automate> Photomerge. Its accuracy is good but approximate. If the photos are not aligned correctly, they are discarded.

DUAL PASS ALIGNMENT: With this switch it is possible to activate the second alignment step. Activating this function, in fact, the photos will be aligned in an approximate way through the automatic alignment of Photoshop, to then be aligned to the maximum precision in a second step (with the maximum tolerance set in the slider "**ALIGNMENT PRECISION**"). This alignment algorithm is proprietary and is not present in any other Photoshop function.

ALIGNMENT PRECISION: With this slider you can change the accuracy of the alignment. The recommended value is 3 pixels, as an ideal compromise between precision and alignment speed. The lower the pixel value, the greater the accuracy but also the time required for alignment.

MAX ALIGN RADIUS: With this slider you can change the maximum radius in which you can align two images. If the set value is for example 15 pixels, the maximum possible alignment distance will be 15 pixels.

If the photos are not aligned correctly, they are discarded.

AREA WIDTH: With this slider you can change the width of the selection area. This command must be used keeping in mind that the greater the size of the area, the greater the calculation time necessary for each iteration of the **DUAL PASS ALIGNMENT**, in favor of precision.

For a normal 24MPX photo, the recommended approximate size is 150/250px, but if possible it is always better to prefer a larger area than necessary rather than too small.

LENS CORRECTION: This function allows you to open files by applying the distortion and vignetting correction available within the Camera Raw plugin.

CHROMATIC ABERRATION: With this function we can also activate the removal of chromatic aberrations, also available in the Camera Raw plugin.

ALIGNMENT HELPER: In some cases, it may happen that the alignment of Photoshop fails to correctly process the alignment of the images due to particular lighting conditions. With this switch it is possible to favor alignment by performing 7 maximum attempts by varying some parameters. In this way, if without the help of the Alignment Helper a good part of the photos were discarded at the end of the elaboration, it is possible to repeat the fusion activating this function, allowing with good probability also to align the images that had otherwise been rejected.

THRESHOLD: This slider allows to act on the threshold parameter of the **DUAL PASS ALIGNMENT**. If you don't know its impact in depth, it's always best to keep it at 128. It's an advanced command that allows the user to set the threshold to extract stars from the sky. For underexposed photos it may be necessary to bring this value to the left, while for overexposed photos to the right.

It should be used sparingly, with the aim of making the alignment stars more evident. To set the optimal value, simply click the **"PLACE"** button under the **"ALIGNMENT ZONE"** item, click on the selection with the right mouse button and select "Deselect" (or for the more experienced click the **CTRL + D** keyboard shortcut for the Windows users or **COMMAND + D** for Mac users), then go to **Image> Adjustments> Threshold,** and move the slider so that you see the stars in a defined way, but avoiding artefacts such as stars that should be round that become deformed white spots etc. Perfection

would be a big star that can be made as round as possible. Then, once you found find the best value for you, keep it in mind, and after clicking Cancel (or possibly OK, it is not important), you can set that value correctly on the "**THRESHOLD**" slider.

If you have not previously selected the alignment area you will have to click the "**PLACE**" button again and then when you have finished, click on "**CONFIRM**", or if you have previously selected the area, you can trivially close the document.

PLACE: This button allows you to load the first photo selected in the Light item and then position the alignment area in the most appropriate way.

The positioning of the alignment zone must be done with a very precise criterion, it must be centered on the largest possible star. In addition to selecting the Dual Pass alignment area, it can be used to immediately load one of our photos, so as to find the most appropriate threshold value based on specific needs.

CONFIRM: At the end of the positioning, it will be enough to click this button so that the position of the area is recorded and applied during the processing.

START: With this key it is possible to start the Stacking process.

RESET: This button has the function of resetting the values of all the sliders to the default values.

La Sezione **DEEP SKY**

In this section you can add several files per channel and get the final color image automatically. In fact Astro Panel is able to determine based on the files you enter what sum to make.

We can add **files R G B**, **L RGB**, L R **G B,HA (R) OIII (G) SII (B), HA RGB.**

ALIGNMENT: With this switch you can enable channel alignment.

ALIGNMENT TYPE: With this switch you can enable channel alignment on automatic or shift.

ALIGNMENT CYCLES: With this slider you can change the accuracy of the alignment. The recommended value is 3 pixels, as an ideal compromise between accuracy and alignment speed. The lower the pixel value, the greater the accuracy but also the time it takes to align.

Tutorial Merge (Silk, Focus Stacking, HDR, Night HDR and Mean Stack)
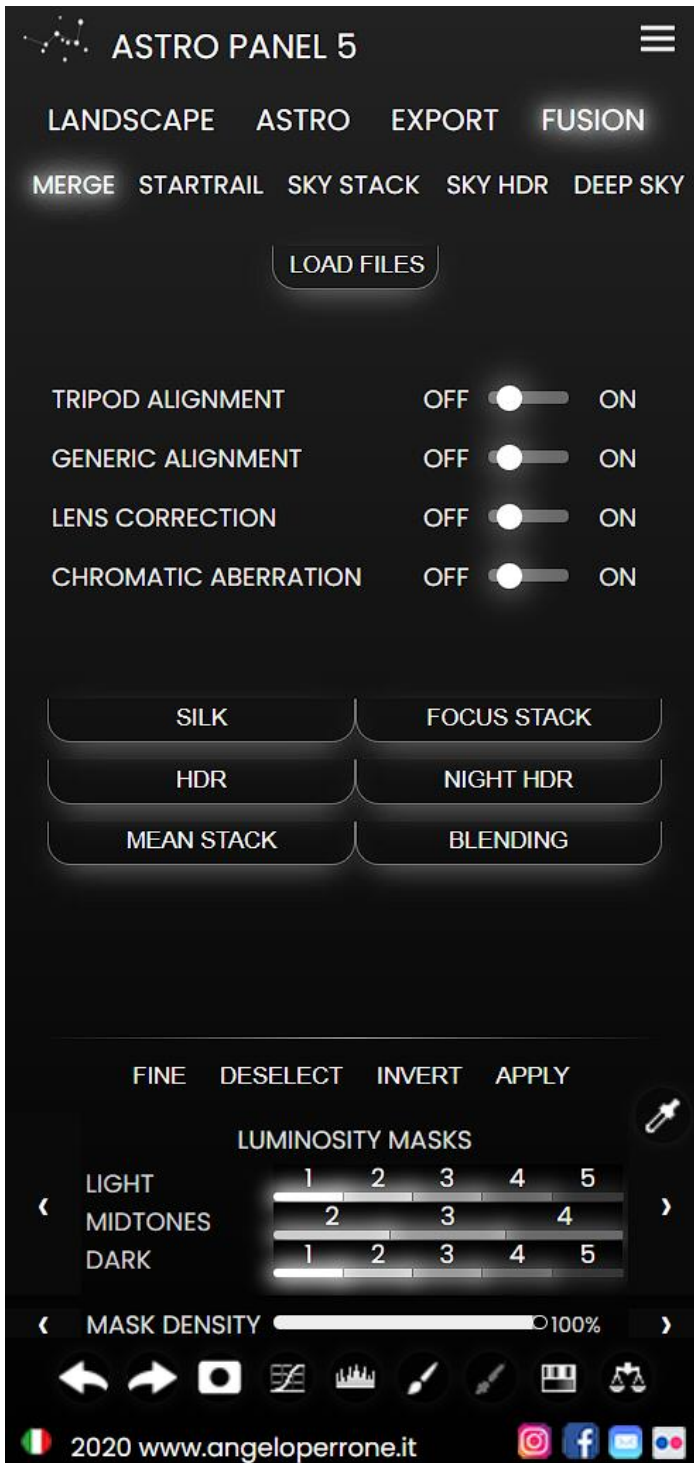

In this tutorial we will explain how to best use the **MERGE** section to achieve a beautiful Silk Effect, Focus Stacking, HDR or Night HDR. The operation is the same for all four casting methods.

For this tutorial, we use a series of night files to upload as "**NIGHT HDR**".

The first button to press is "**LOAD FILES**" to upload our photos. Once selected we must choose the type of alignment we want between "**GENERIC**" or "**TRIPOD**". We refer you to page 28 to discover the differences between the two commands. We choose "**TRIPOD**" (repositioning method) and active "**LENS CORRECTION**" to correct lens distortion and "**CHROMATIC ABERRATION**" to correct chromatic aberrations.

Once all the parameters have been set, I press the "**NIGHT HDR**" key and wait for the final processing.
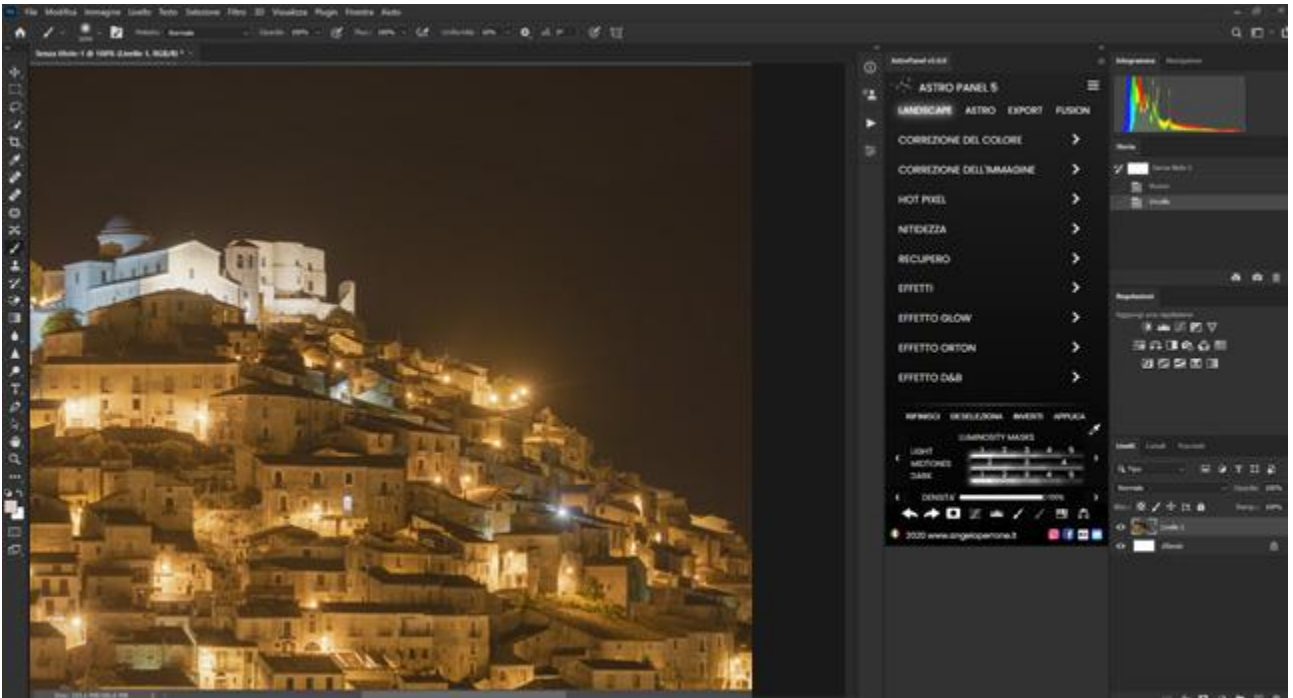
*The RAW used for this test were kindly sent by Andrea Consuele*

The end result is a layer as an advanced object so that you can modify the parameters again in Adobe Camera Raw (see the image above).

This procedure is the same for the other types of fusion of the shots and the result obtained by the fusion can be enhanced and modified with the features present in the **PRO** section.

Tutorial for Startrail

Now let's illustrate how to merge images to create a Startrail. The procedure is similar to that of the **MERGE** form.
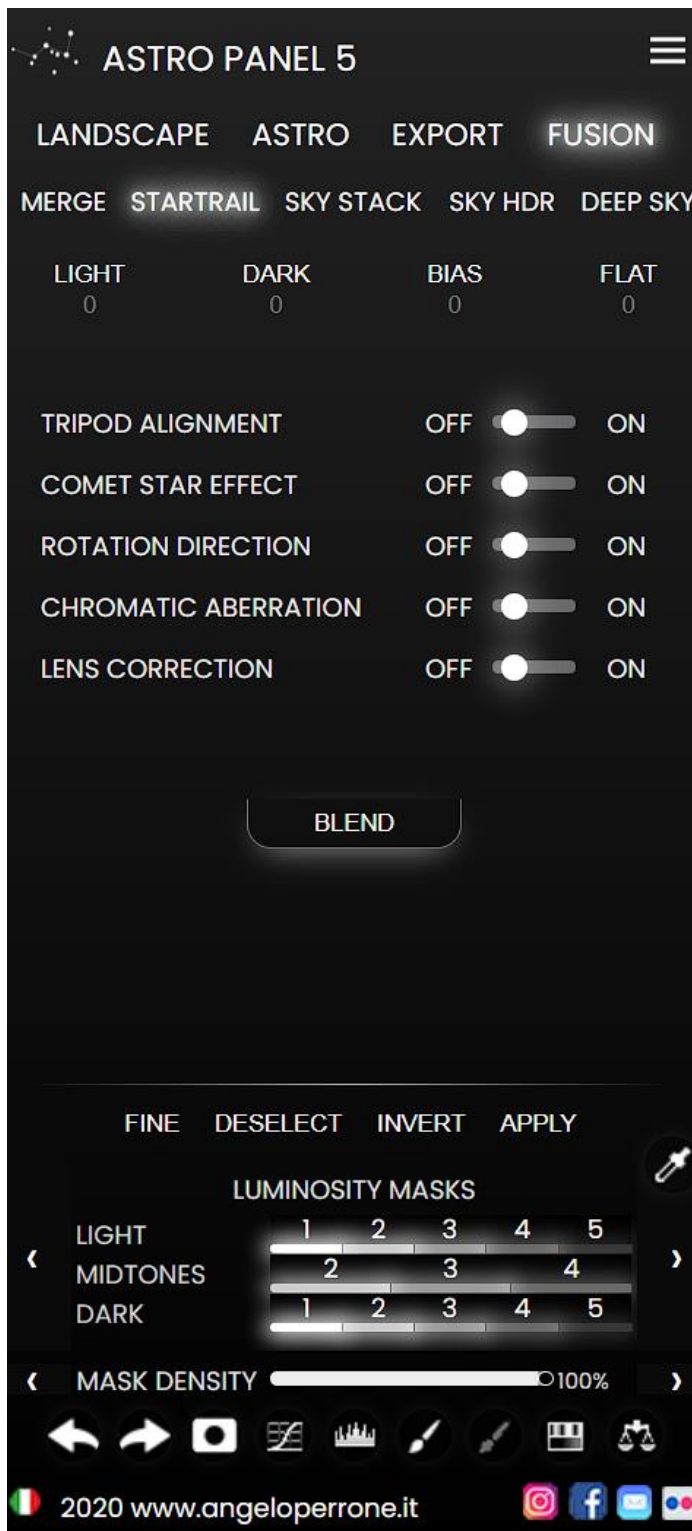
The first button to press is "**LIGHT**" to load the Startrail light frames. If available we can also load **Dark**, **Bias** and **Flat** frames. Once you have selected the photos to upload, we must activate the "**TRIPOD ALIGNMENT**" alignment. This switch activates the automatic alignment of the levels, the one accessible to all in the section Edit> Automatic level alignment, and automatically finds the alignment method.

In the Stratrail tab we can also apply the "**COMET STAR EFFECT**" effect to give an effect to the stars streaked with shooting stars or to reverse the direction of the startrail using the "**ROTATION DIRECTION**" switch.

We activate "**LENS CORRECTION**" to correct lens distortion and "**CHROMATIC ABERRATION**" to correct chromatic aberrations.

Click on **BLEND** to start the image fusion and wait for our Startrail.

Tutorial Sky Stack – Sky Stack HDR
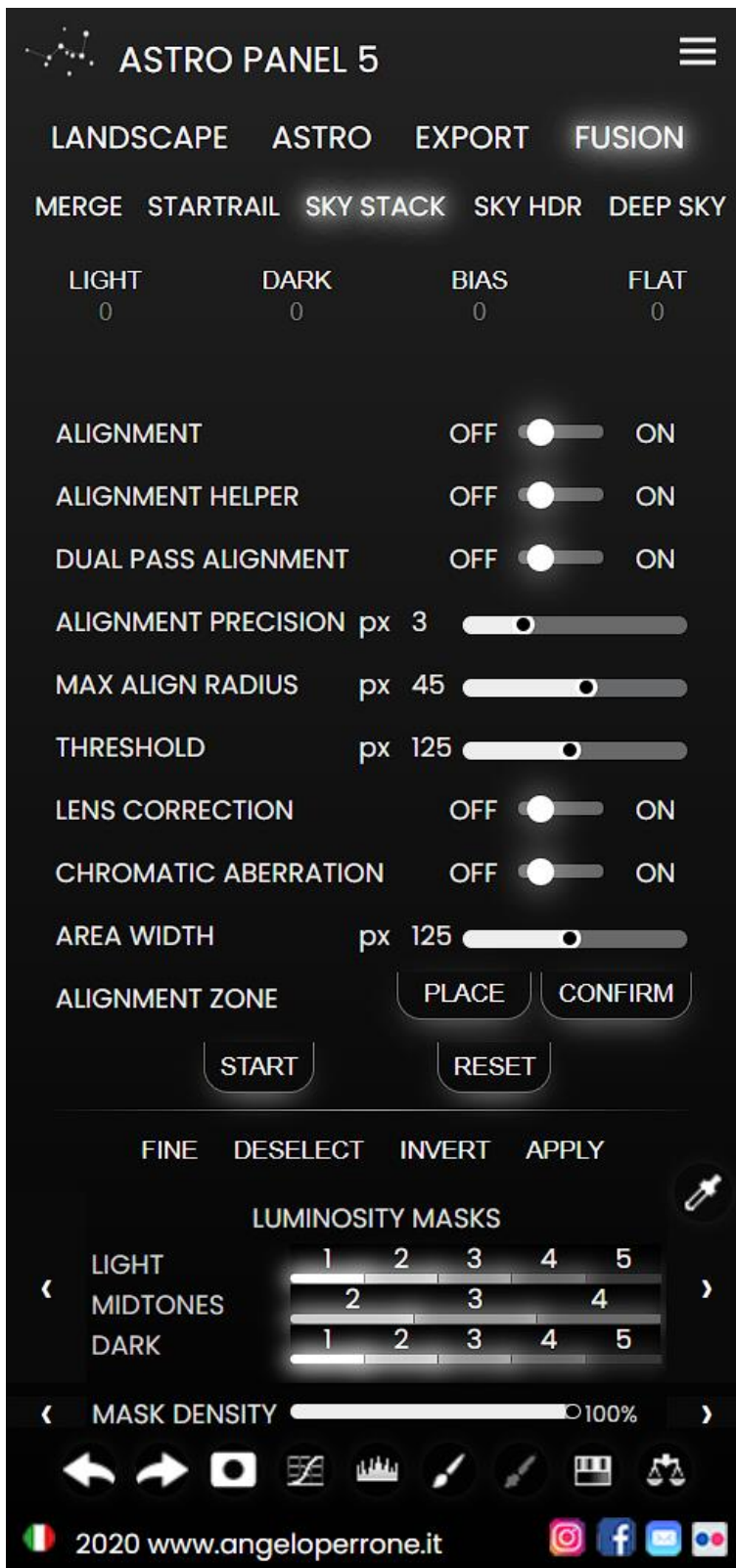
In this tutorial we will explain how to stack images of the Milky Way or the deep sky using the **Sky Stack** and **Sky Stack HDR** section.

The difference between the two types of merger is in the file upload. In the first type we will only add files that have a **single exposure** while in the second we can add more files with **different exposures** (different times or ISO). We can also load dark, bias and flat to increase the final quality of the file.

Before starting the fusion of the images, we can edit all our files in Adobe Camera Raw without opening them in Photoshop CC (just click on the CLOSE button of Adobe Camera Raw) to generate the **XMP** files that will be read by Fusion. In this way we could for example correct the color or white balance of our images to have a correct final result.

After this introduction and after

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closing Adobe Camera Raw, the first button to press is "**LIGHT**" to load the light frames, then we move on to loading the dark, the bias and the flat field frames. If we don't have all the required file types it doesn't matter, Fusion will still process the merging of the images.

To make the best use of the alignment tools, it is essential to understand how they work and when and how to use each slider.

Normal alignment, by itself, is capable of aligning photos with precision and speed, but sometimes, when this alignment is not effective, you can resort to activating the alignment helper. As already mentioned, this function, by varying some parameters, tries to make some types of photos less "indigestible", making them better aligned by automatic alignment, but paying a price in terms of processing time.

If absolute precision is required, simply activate the dualpass alignment. This tool is extremely accurate, but also slower, based on the amount of misalignment of each frame.

In summary, in order we have:

1) Alignment - Fast and fairly accurate, but sometimes it fails to align some photos
2) Alignment + Alignment Helper - Slightly less fast and fairly accurate, and should have fewer problems with some types of photos
3) Alignment + Alignment Helper + Dualpass Alignment - Less fast but extremely precise
4) Alignment + Dualpass Alignment - Even less fast but extremely precise

Note: In the case of large misalignments, option 3 is faster than in case 4, but in the case of misalignments of a few pixels, option 4 is faster.

According to the needs it is therefore possible to set one of the 4 configurations to have the desired result in the desired time. I refer you to page 29 for technical details.

In this tutorial, we chose 5 images of the Milky Way chased with star tracker Skywatcher Star Adventurer for a total of 120 seconds at ISO 1600. We can activate all 3 types of alignment or decide to activate only the first two. Next parameters to be set will be "**ALIGNMENT PRECISION**" and "**MAX ALIGN RADIUS**" which I set to 2 pixels to have a higher precision of alignment and 20 pixels the maximum radius in which it is possible to align two images and to avoid that some light frame.

If you have also activated the "**DUAL PASS ALIGNMENT**" we have to make a small introduction. The "**DUAL PASS ALIGNMENT**" is a type of customized alignment with which we can decide the accuracy of the alignment. This type of alignment is activated by setting the maximum threshold of the stars to have a maximum alignment accuracy, that is by setting the slider "**THRESHOLD**".

To set the threshold, proceed as follows:
- Set the sample area of the image, without exaggerating, for "**AREA WIDTH**";

- I press the PLACE key and go to look for an area of the sample image. In my case I used the planet Jupiter as a sample star for alignment;
- Go **to Image> Adjustments> Threshold**, and move the slider so that you see the stars in a defined way (see the following image);
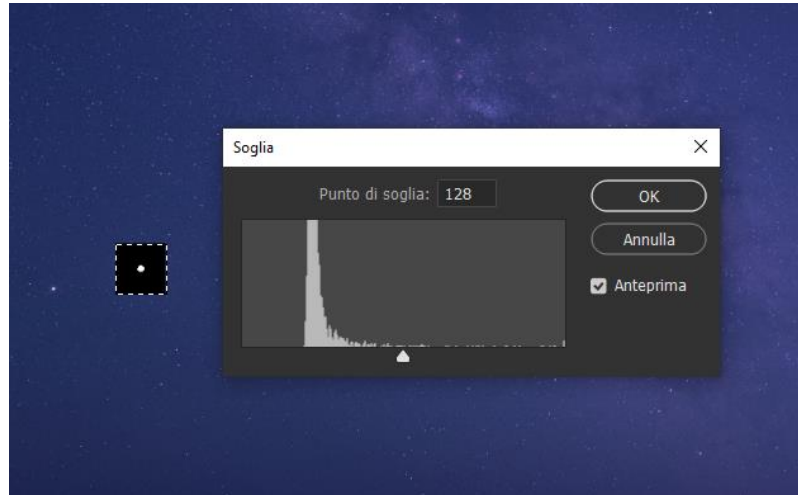

- Once the best value is found, click on Cancel or OK (it is not influential), you can correctly set that value on the slider "**THRESHOLD**".
- Press "**CONFIRM**" to confirm these parameters;
- You can also correct lens distortion using the "**LENS CORRECTION**" switch and chromatic aberrations with the "**CHROMATIC ABERRATION**" switch.
- To start image stacking press "**START**".

If the images do not perfectly align, we click on the "**RESET**" button to reset all the original parameters and modify them so that the fusion is successful.

Tip: If you are using light frames photographed with ultra-wide angle lenses and not starred, do not use the "**LENS CORRECTION**" function.
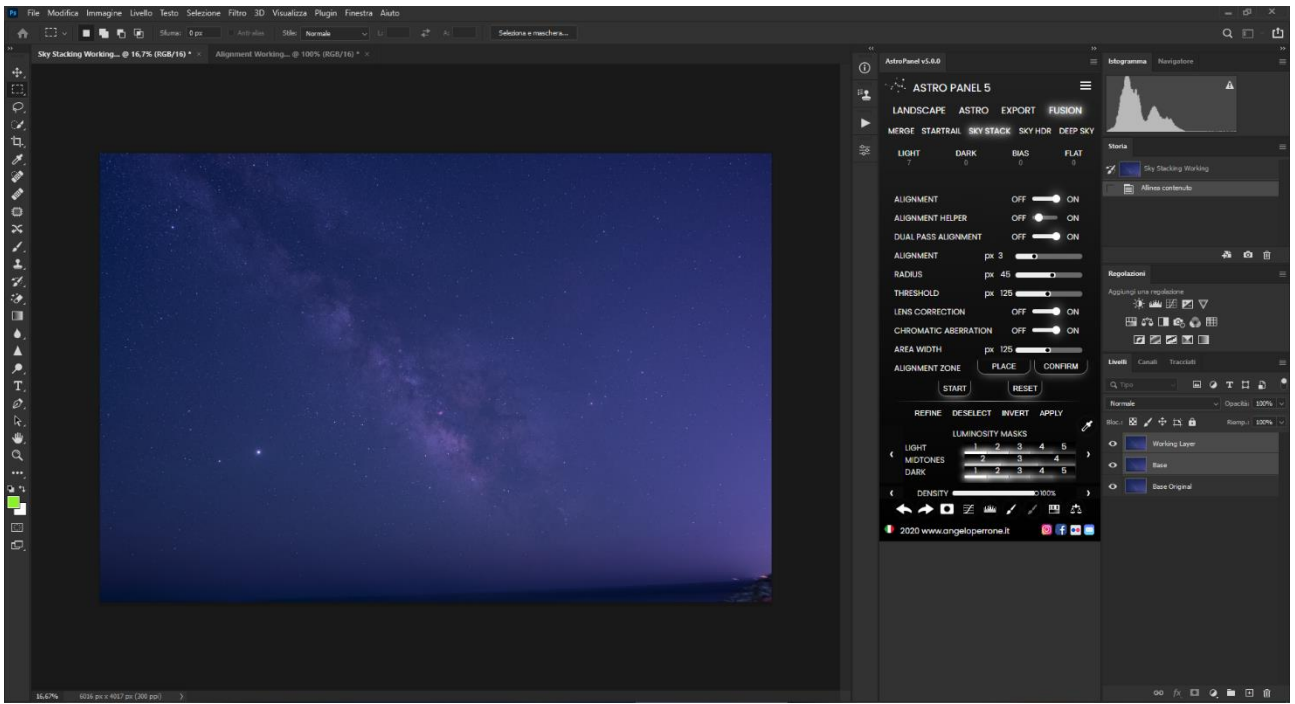
Tutorial **DEEP SKY**
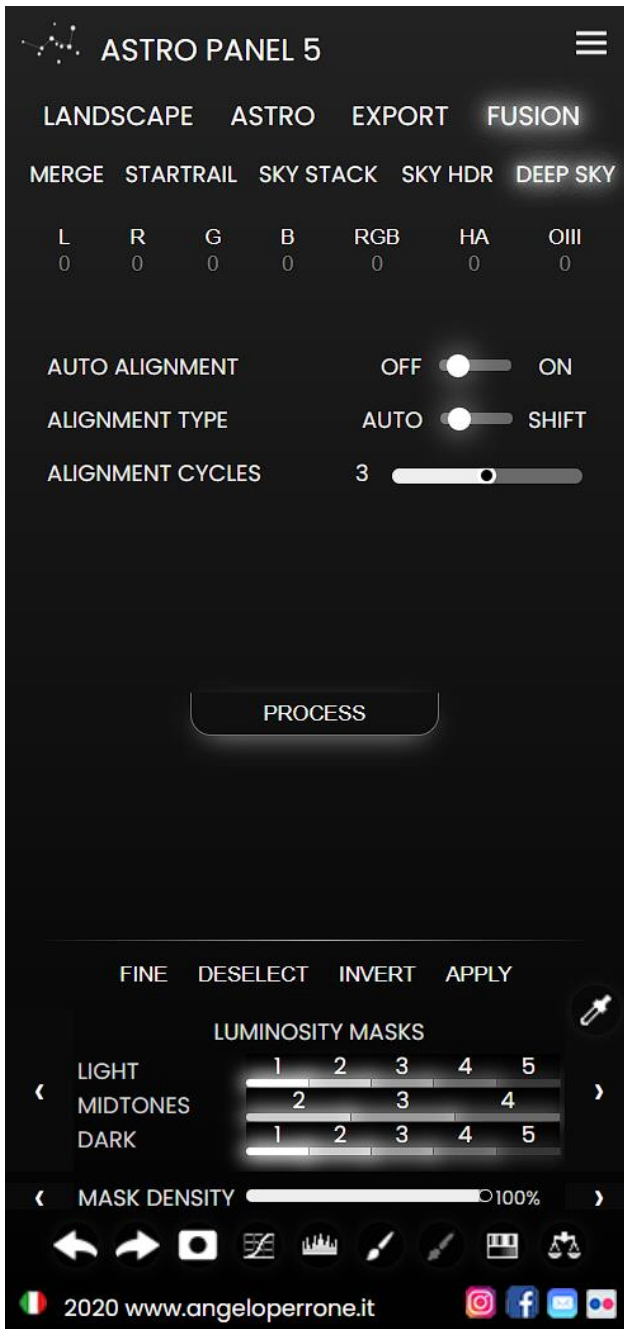
In this tutorial we will explain how to stack images of the Milky Way or deep sky using the **DEEP SKY tab.**

In our example, we'll upload three **R G B** files, and Astro Panel will automatically upload files to the appropriate channels to create the final RGB image.
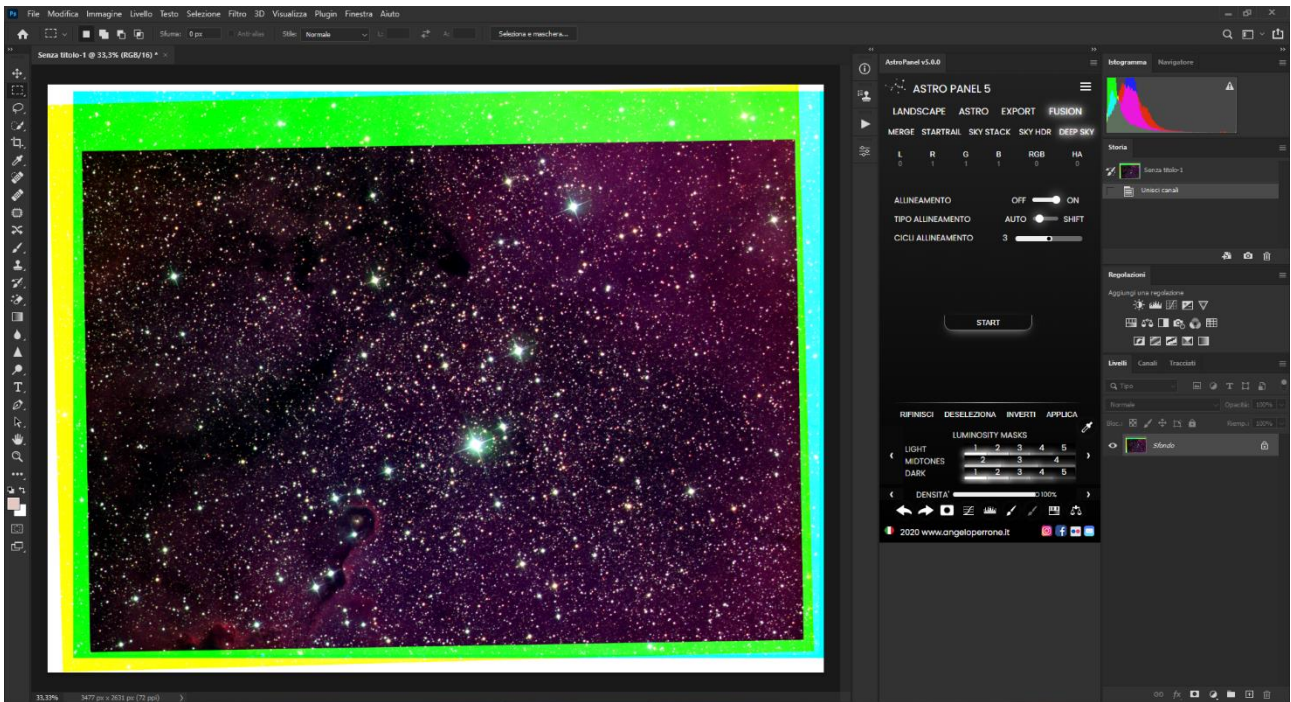
We upload files and select **AUTO ALIGNMENT** to ON and **ALIGNMENT TYPE** on SHIFT as our files are not taken in the same way.

ALIGNMENT CYCLES let's leave it on 3 to have a balanced alignment between speed and performance.

At this point we click on **PROCESS** and wait for it to be processed.
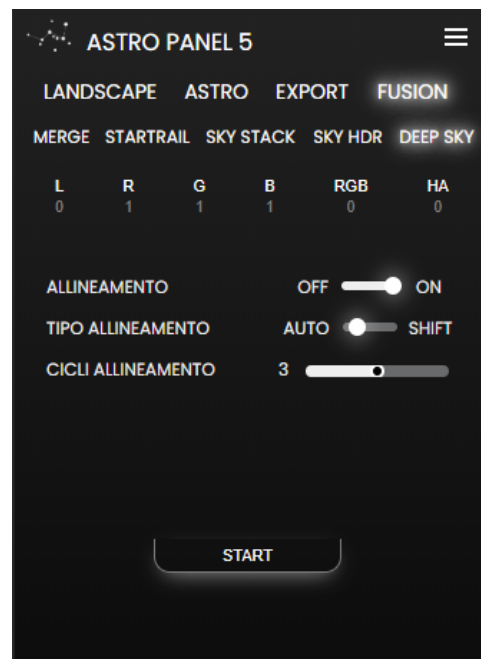
Alignment Process of channels R G B

Once the alignment is complete, we cut out the excess edges and regulate the colors with the "Selective Color Correction" tool.

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Thanks for reading.