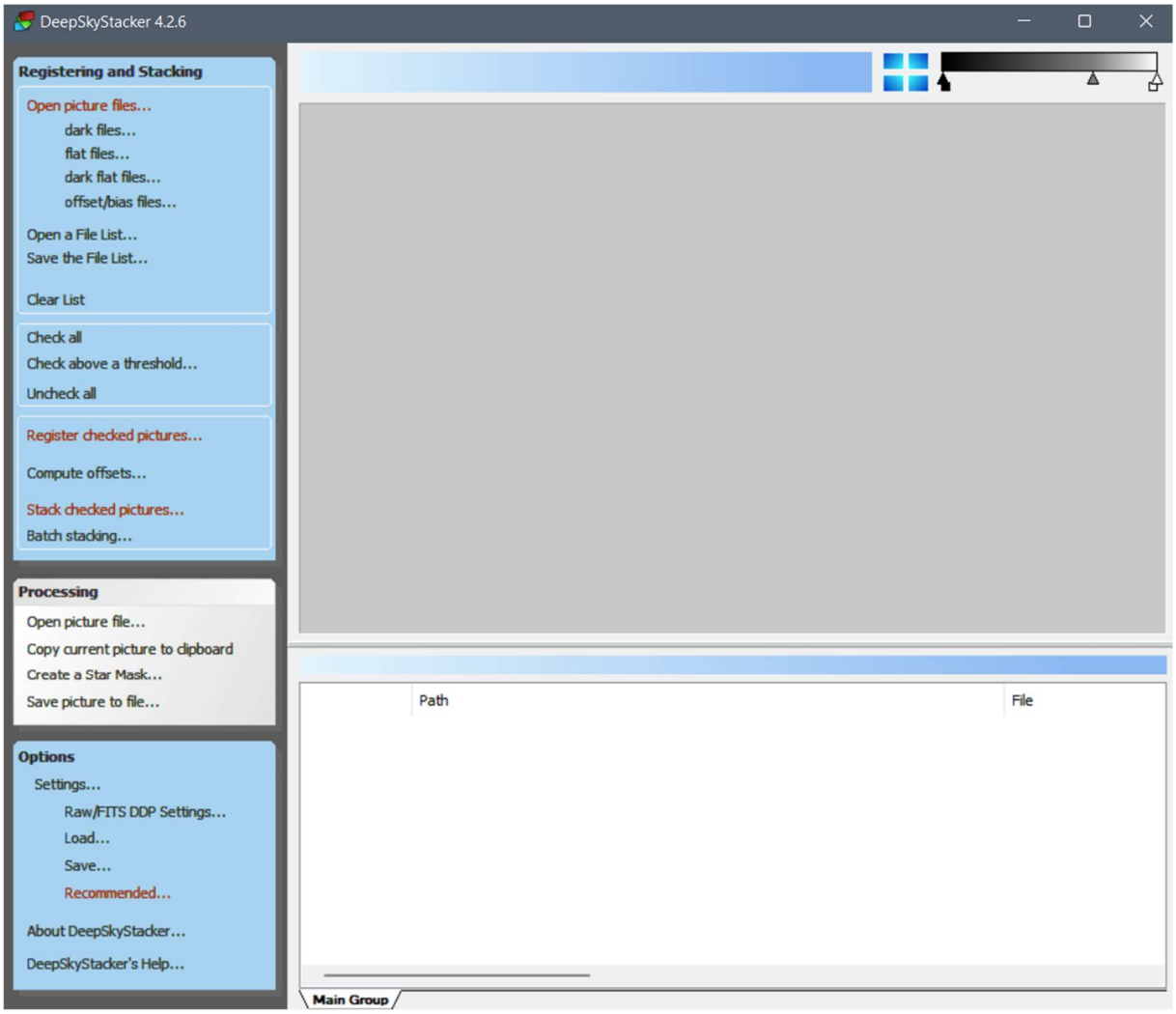
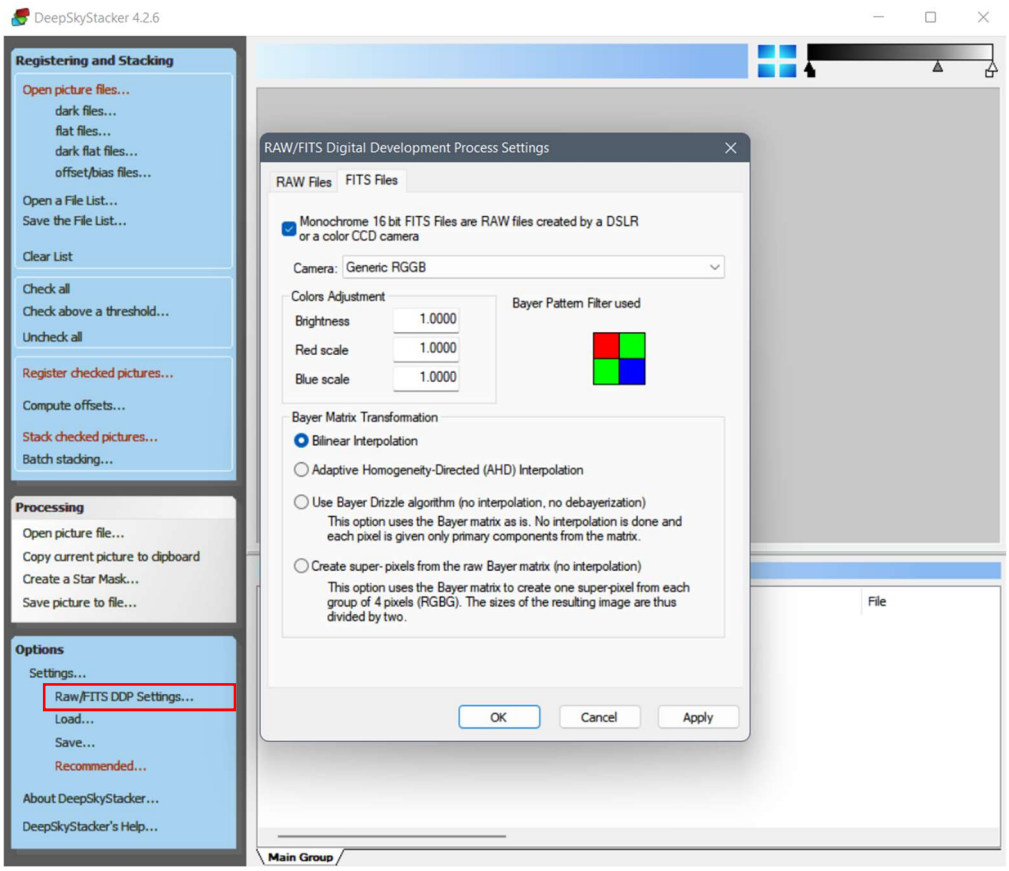
Stacking with the DeepSkyStacker (version 4.2.6)

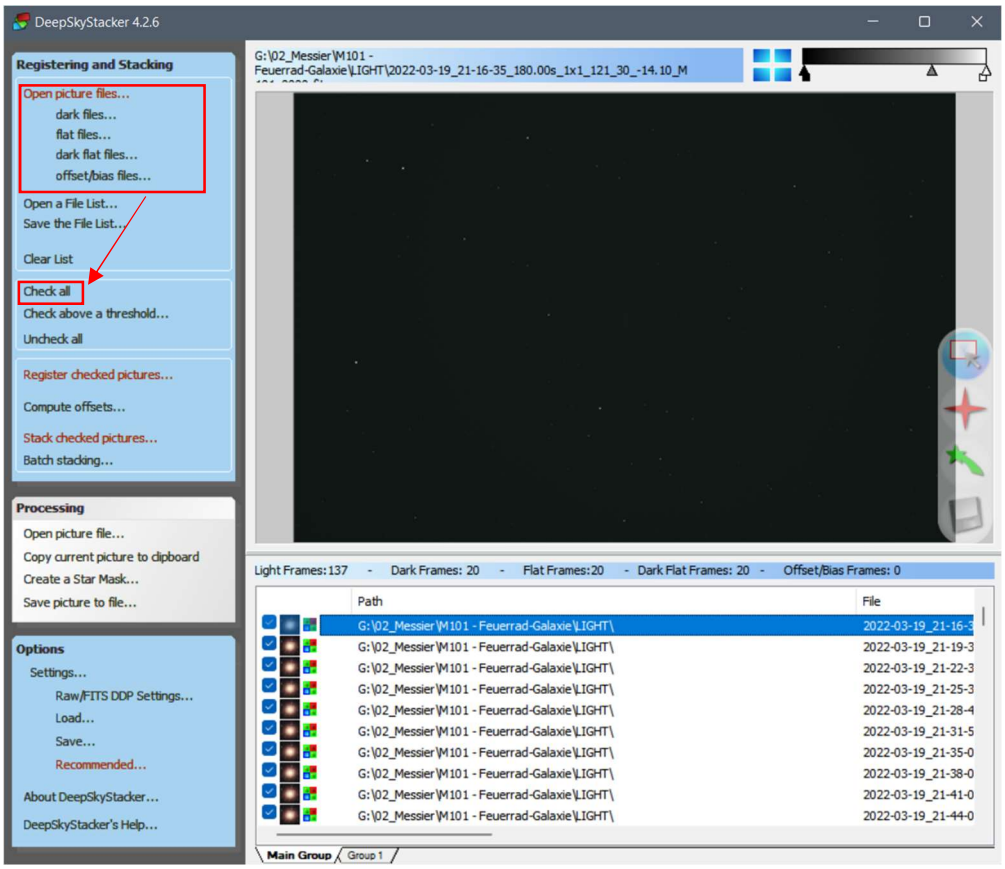
After installing the DeepSkyStacker program (http://deepskystacker.free.fr/english/), you will see this splash screen:



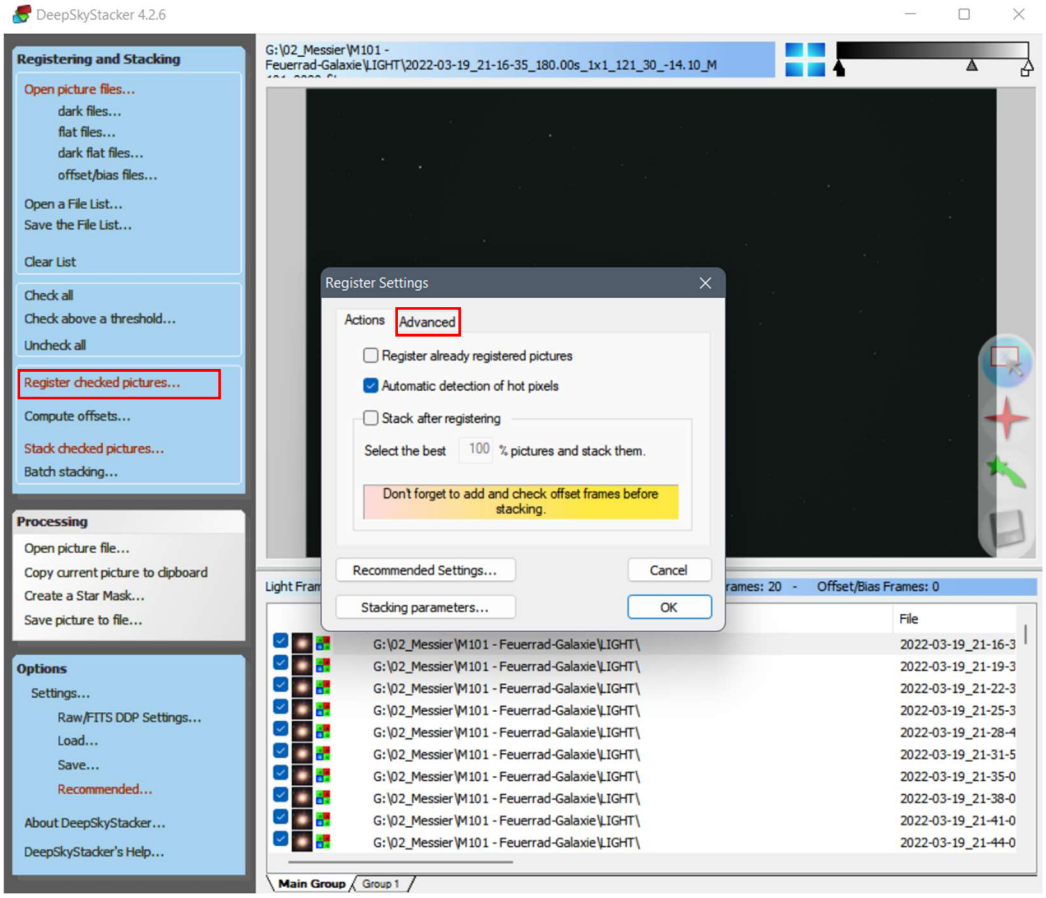
First, under the settings, it is determined whether a monochrome or a color camera was used and how, in the case of a color camera, the Bayer matrix is included.



Afterwards, the corresponding image types can be loaded and selected via the points in the upper left corner.

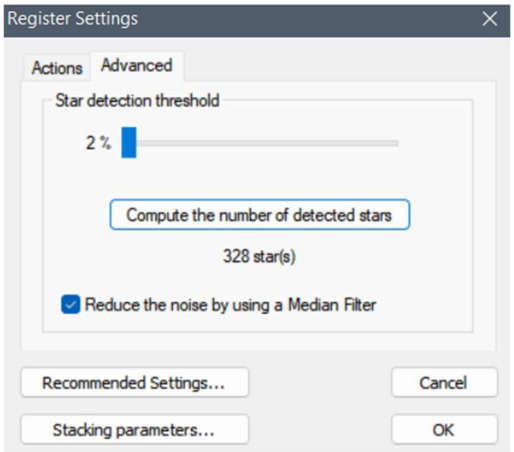


Next, the images are registered. In the process, the images are matched to each other so that they can also be superimposed exactly via common reference points (usually stars).



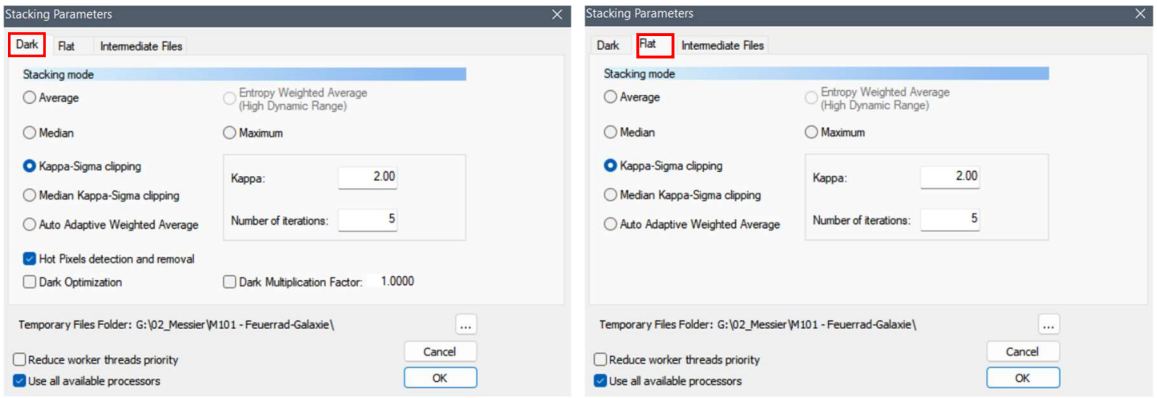
There is also the hint to add bias-frames (offset-frames). Since darkflat-frames are used here, the bias-frames are not required. (see menu item 'Basics' - 'Bias, dark, flat and darkflat-frames').

The software should detect hot pixels, but not start stacking after registration. Parameters for the registration and stacking can still be defined via the 'Advanced' tab.



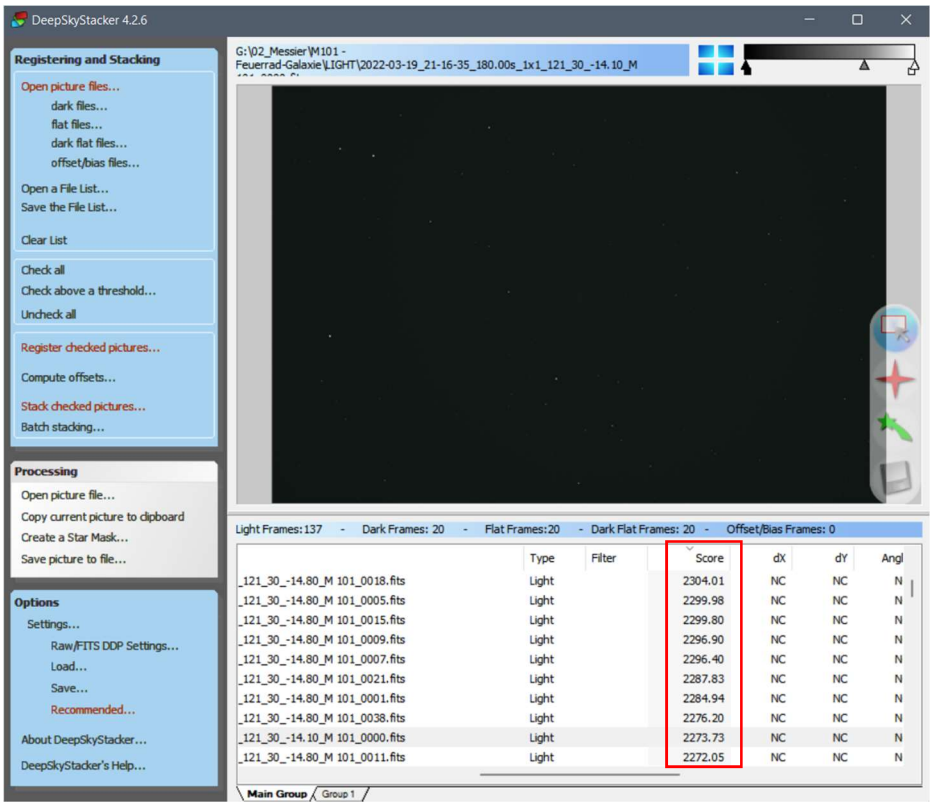
To keep the computational effort as low as possible, it is sufficient for the registration if a maximum of a few hundred stars are selected as reference points. This can be set via the threshold slider and tested with the button 'Number of recognized stars'. If the images are not low-noise, the median filter can be used to ensure that some of them are recognized as stars due to excessive noise differences between the pixels.

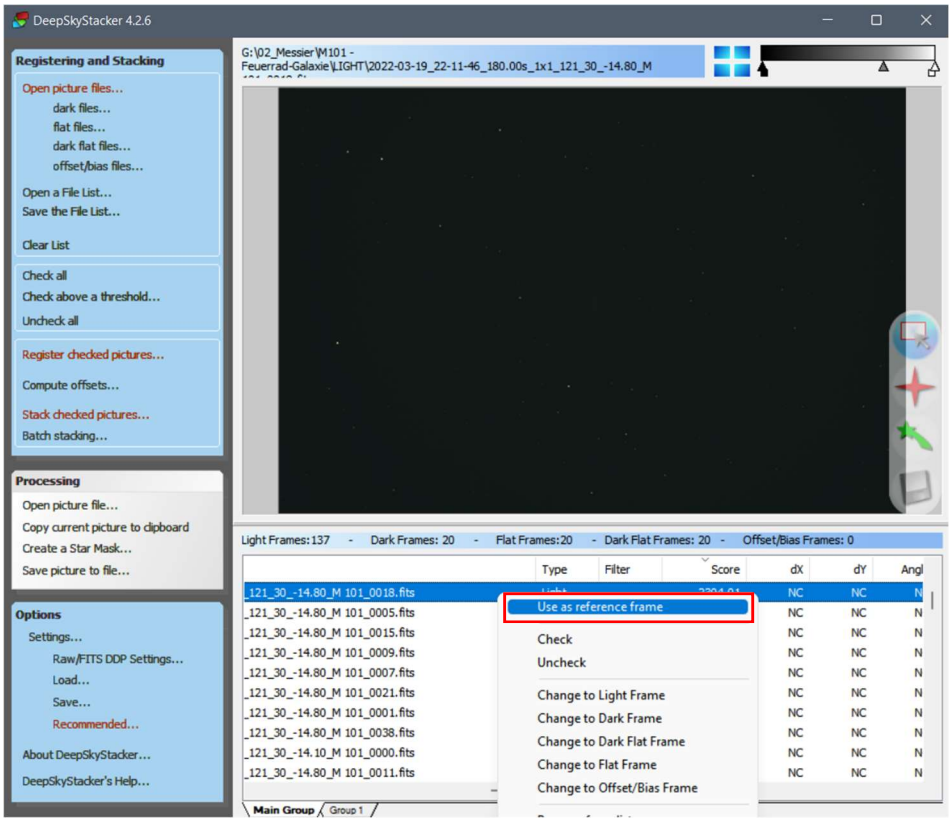
The 'Stacking Parameter' button can also be used to define how the individual calibration images are to be treated mathematically during superimposition.



Kappa-sigma clipping is usually the best method for this. Information on the mathematical procedures can be viewed at http://deepskystacker.free.fr/english/technical.htm.

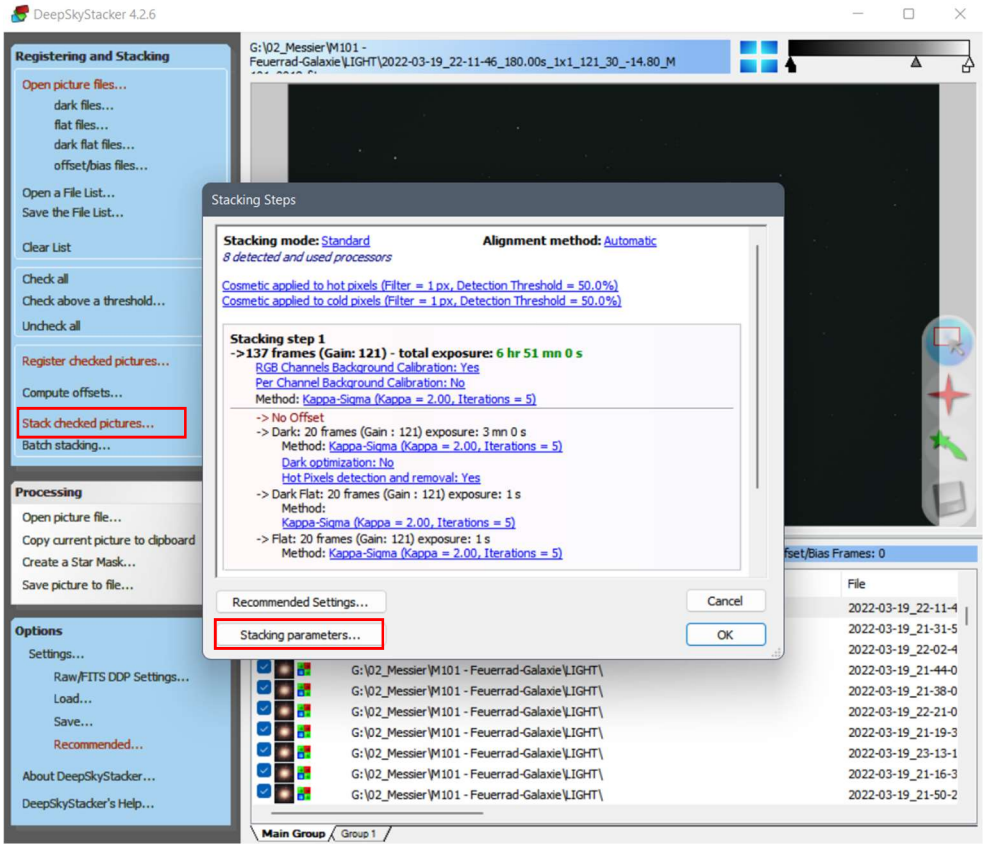
The registration is now started. As a result, the images are listed according to an evaluated order. Here you can check whether there are outliers that should not be used in stacking if possible.



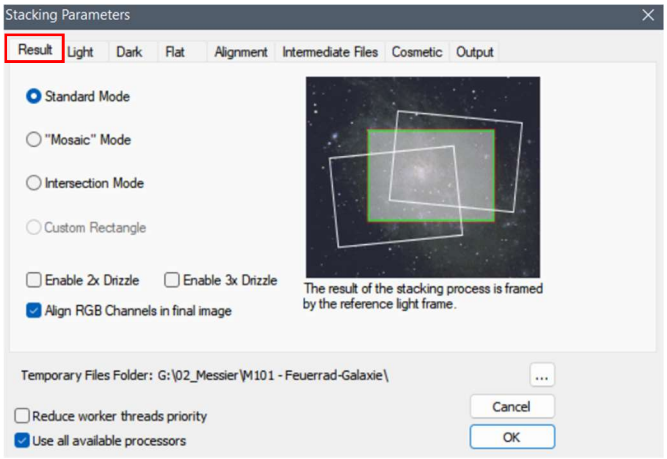


The image with the best score can be selected as the reference image by right-clicking. All other images will then be aligned to this image.

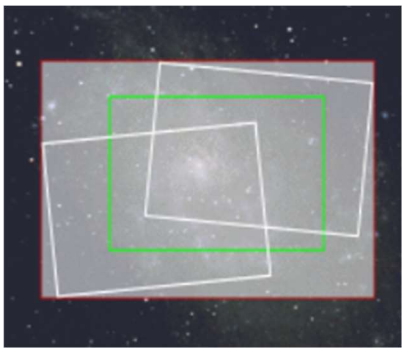
Once the selection is made, the images are stacked by clicking in the left menu bar.



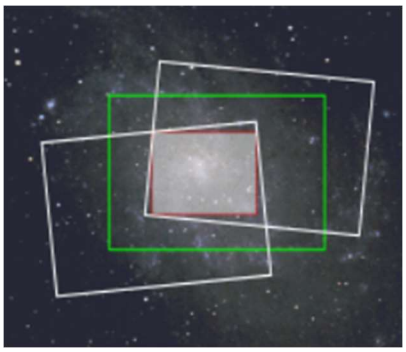
Afterwards, parameters for the operation can be defined again via the 'Stacking Parameter' button.



Because a reference image was selected, the default mode can be kept in the first tab. The "Mosaic" mode would keep all edges and the intersection mode would use only the part that is present in all images. This is useful when image field rotation has occurred, as with azimuthal mounts (see menu point 'Equipment' - 'Tripod and mount').



„Mosaik“ mode

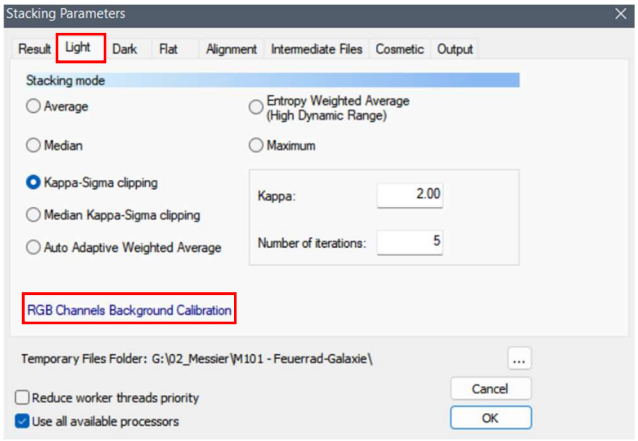


Intersections mode

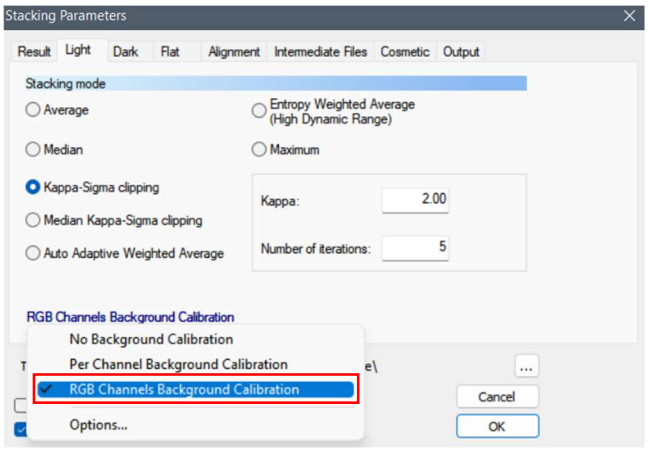
Drizzle can remain deactivated for the moment. In this process, pixels are divided into 2x2 or 3x3 pixels, e.g. to make the image appear softer in case of large pixels, or if objects are zoomed in and should not appear pixelated. However, this increases the storage space for the image enormously.

When aligning the RGB-channels, the three color channels are aligned against each other to reduce color shift in the final image. This is to prevent the stars from appearing red on one side and blue on the other. (http://deepskystacker.free.fr/english/technical.htm)

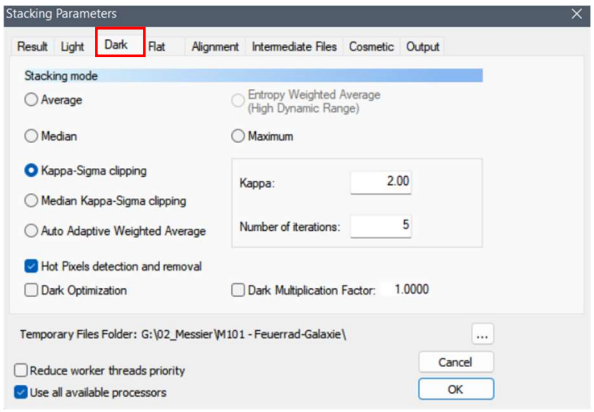
Under the 'Light' tab, Kappa-Sigma clipping is selected again.

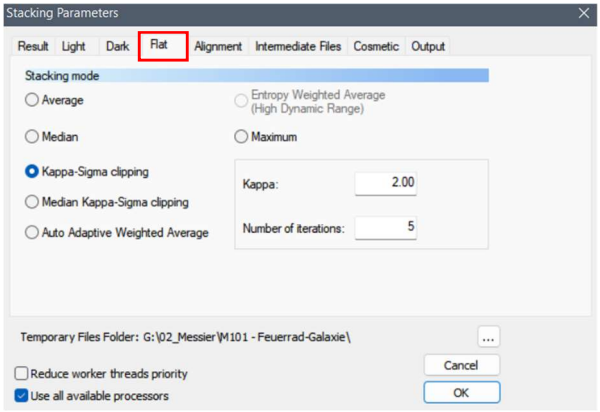


For Kappa-Sigma Clipping and Median Kappa-Sigma Clipping it is important that a color calibration is selected. Here the option 'RGB channels background calibration' can be selected. This creates a neutral gray background without color casts.

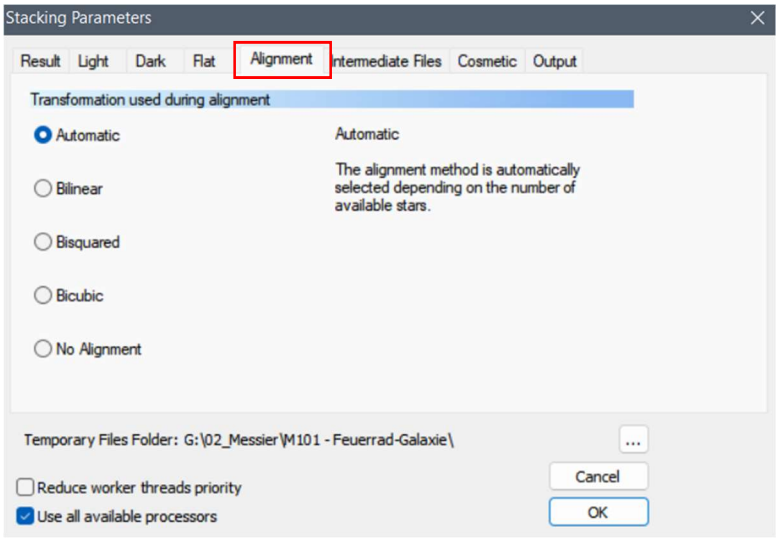


Kappa sigma clipping is also used for dark- and flat-frames.

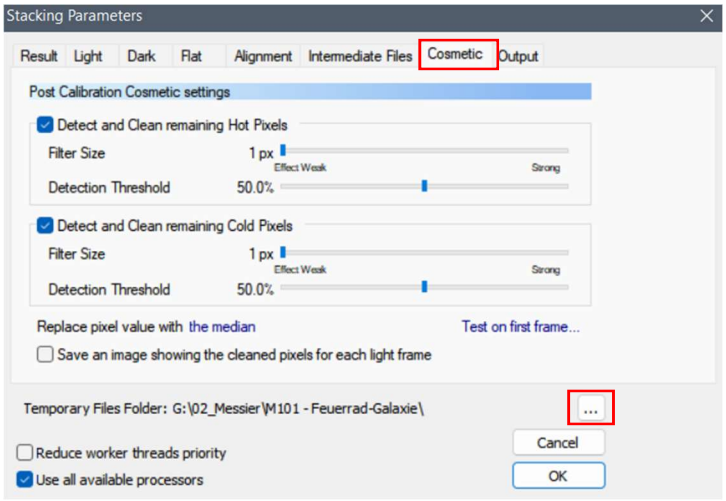




Under 'Alignment' the default value remains 'Automatic'.

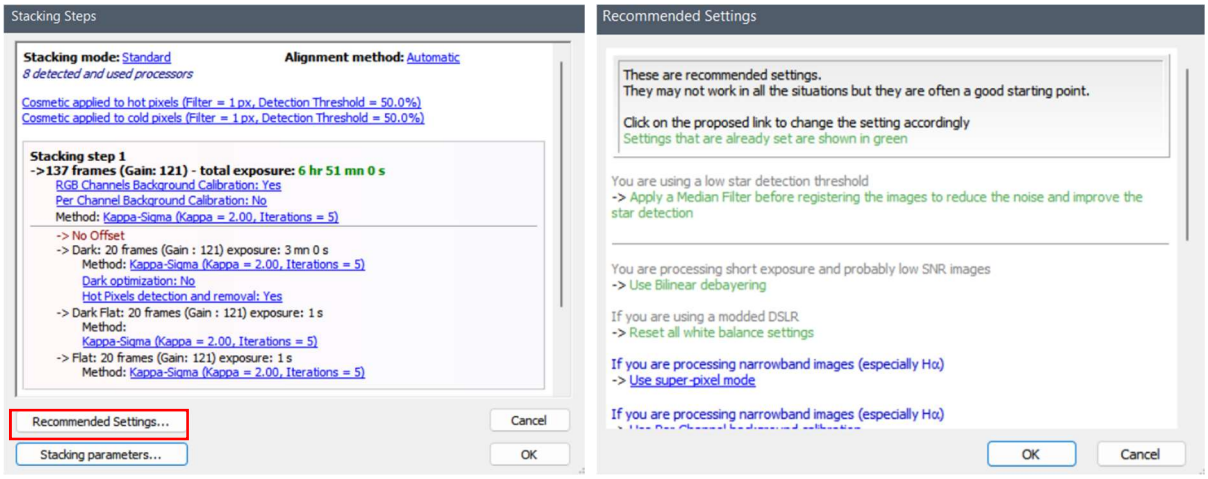


And under 'Cosmetics' you can still select that and how hot or dead pixels (cold pixels) are to be handled.

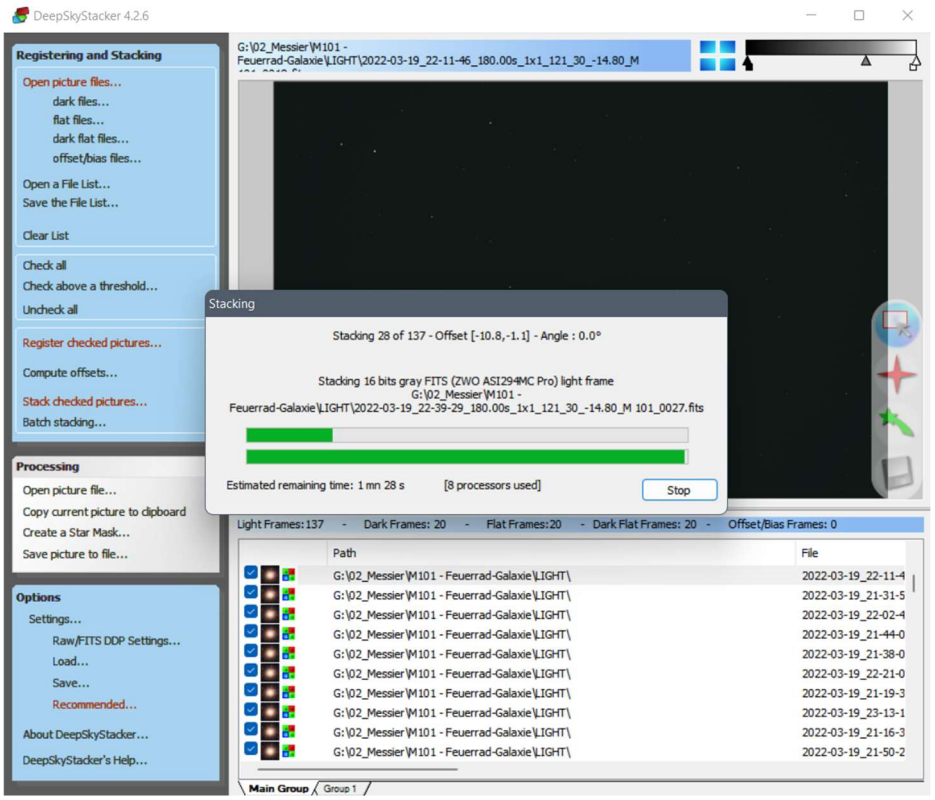


Then you can define the temporary folder for the calculation of the necessary intermediate images and close the window with 'OK'.

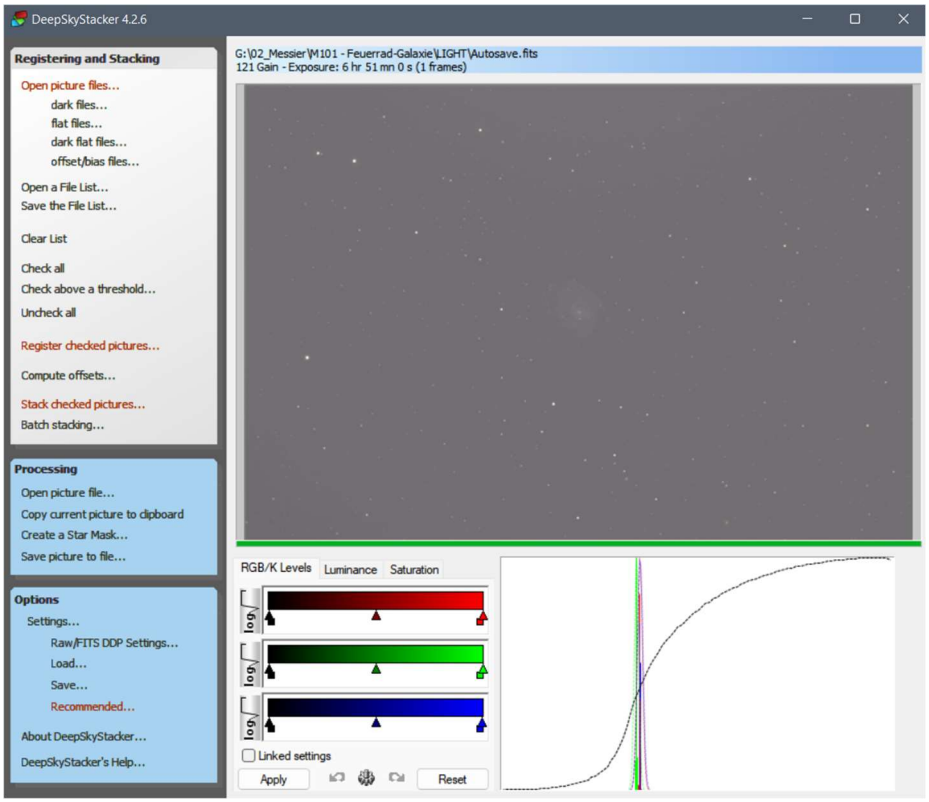
In order to check whether everything is set correctly, you can now check all entries via the 'Recommended settings' button and change them if necessary.



The process is now completely defined and can be started.



After some time the image is ready stacked and placed in the light-frames folder for further image processing.



Note: The automatic stretching in DeepSkyStacker does not work optimally. That's why the image looks very pale and milky.