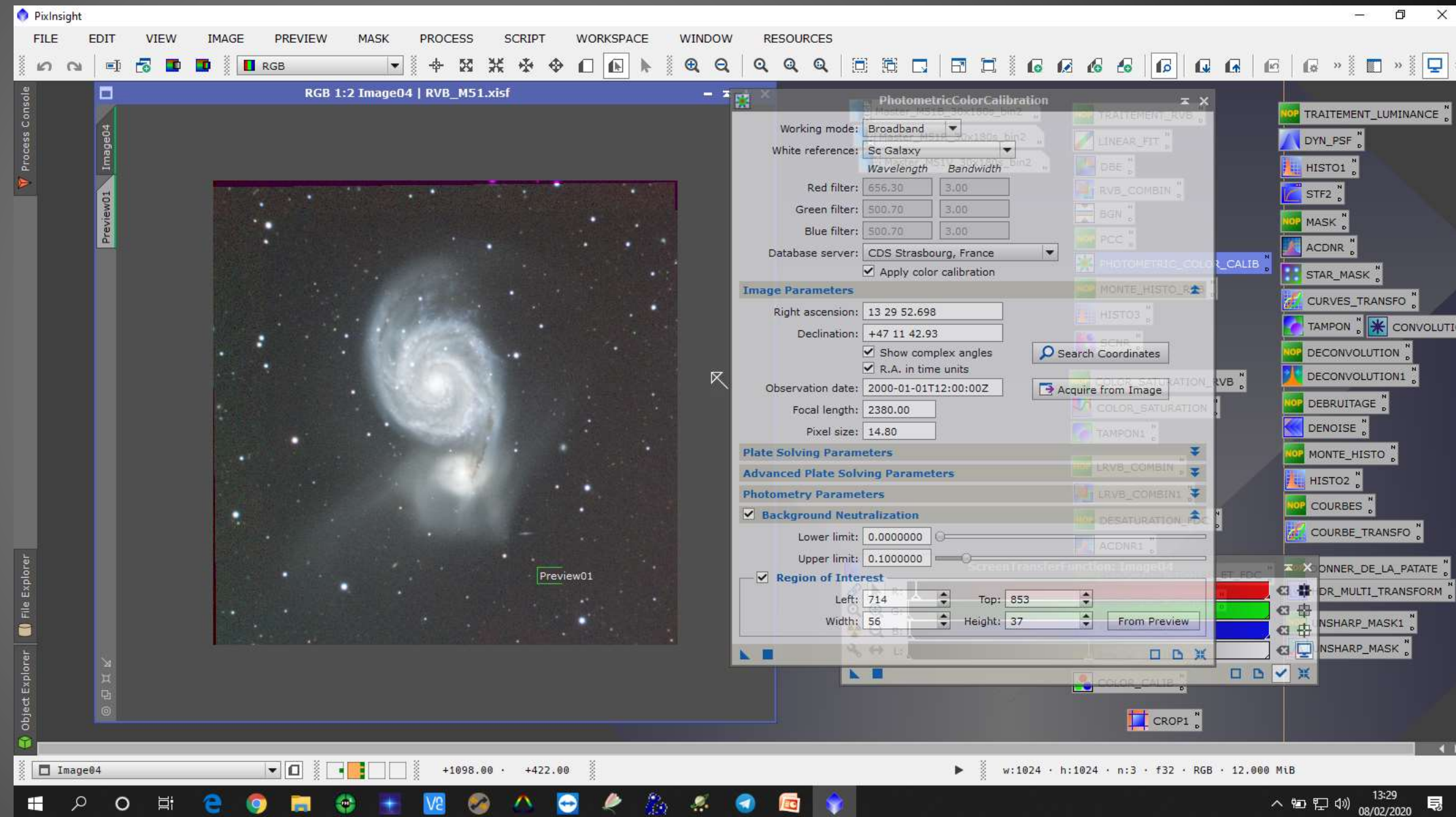


CALIBRER LES COULEURS (1^{er} METHODE) AVEC LE PROCESS PHOTOMETRIC_COLOR_CALIBRATION

- Ouvrir le process « PhotometricColorCalibration »
- Charger l'objet dans le database server
- Remplir les données sur la focale de l'instrument et la taille des pixels utilisés
- Cocher la case Region of interest et faire un preview du fond de ciel, on vient ensuite sélectionner ce preview.



Le processus de calibration des couleurs est terminé, le process a été chercher des calibrations de couleurs sur un database (ici sur le server SIMBAD de l'observatoire de Strasbourg)

The screenshot displays the PixInsight interface with the PhotometricColorCalibration workflow completed. The Process Console on the left shows the following details:

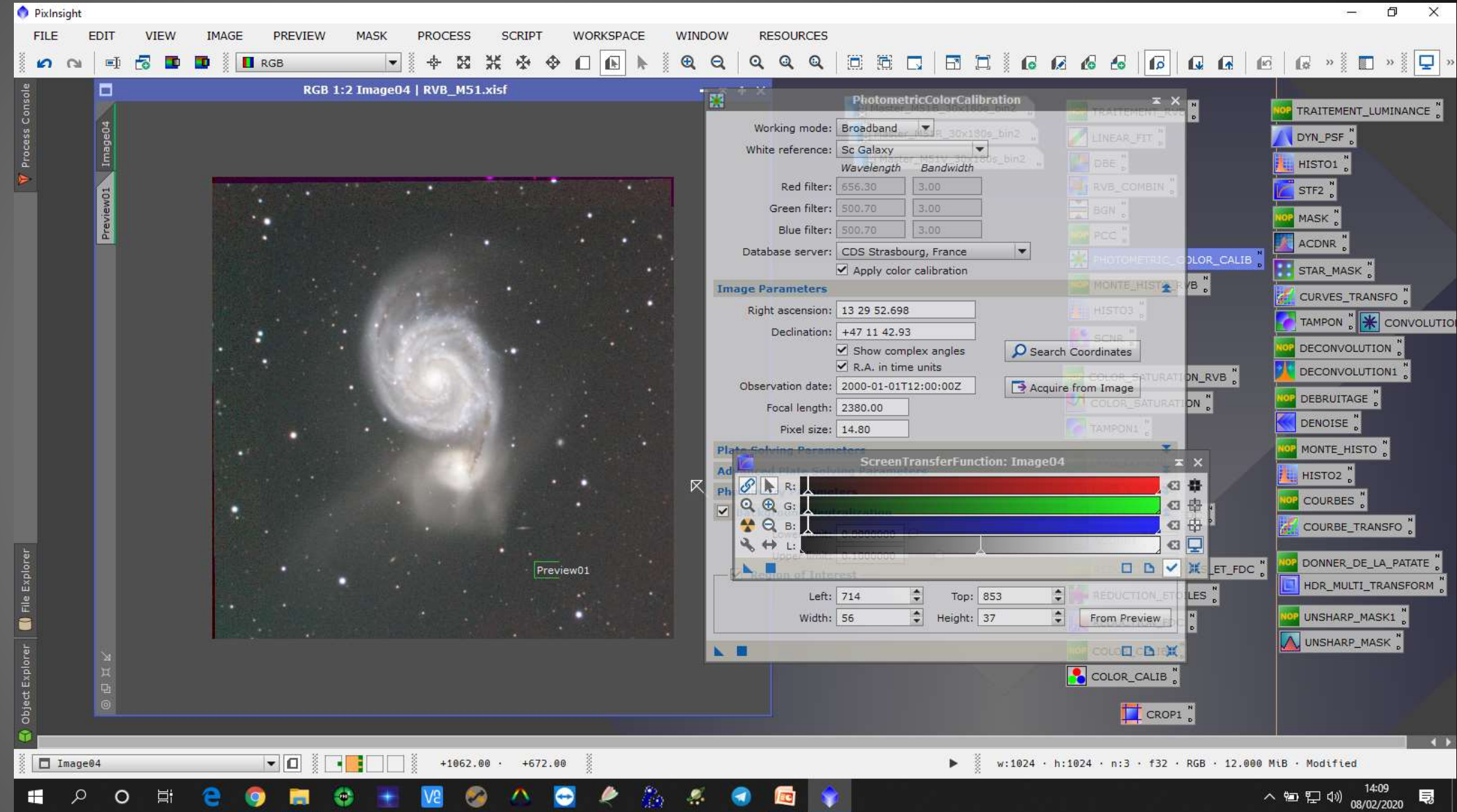
- Process Console: 32 star(s), 32 PSF fittings, Found 0 stars with invalid position, Reference stars: 32, Validating reference stars, Stars with problems: 0, Calculating image noise: sigma=14.368 count=62.13% layers=4, Multiscale median transform: done, Multiscale reconstruction: done, Normalizing sample values: done, Aperture Photometry: Aperture: 12.000000 px, Image resolution: 1.282290 sec/px, Calculating photometry: Processed 32 stars in 0.030000 seconds, Astrometric error: RMSx=0.1402" RMSy=0.1669" RMS=0.2180", Writing output file: C:/Users/user/AppData/Local/Temp/PCC_B_EYCKC@RPJ5UG.csv, Writing table: C:/Users/user/AppData/Local/Temp/PCC_PSF_Flux.csv, Writing table: C:/Users/user/AppData/Local/Temp/PCC_Flux_Ap12.csv.
- Photometry process finished: 3 of 3 images processed successfully. 0 images with errors.
- Color transformation functions:
 $R-G = -8.073930e-01 + 1.357050e+00*(Sr-JV) \pm 4.910917e-02$
 $B-G = -2.120221e+00 + 6.586068e-01*(JB-JV) \pm 3.123371e-02$
- White balance factors:
W_R : 3.5331e-01
W_G : 1.0000e+00
W_B : 2.2068e-01
- Applying white balance: done, Region of interest : left=714, top=853, width=56, height=37, Evaluating background reference: done, Background reference:
B_R : 7.96270e-03
B_G : 2.02296e-03
B_B : 1.40158e-03
- Applying background neutralization: done, 12.270 s

The main window shows two scatter plots for White Balance Functions:

- Top plot: X:r'-V Y:r'-G N:31. The plot shows a positive linear correlation between r'-V and r'-G, with a blue regression line. The y-axis ranges from -1.7 to -0.9, and the x-axis ranges from -0.6 to -0.2.
- Bottom plot: X:B-V Y:B-G N:32. The plot shows a positive linear correlation between B-V and B-G, with a blue regression line. The y-axis ranges from -2 to -1, and the x-axis ranges from 0.5 to 1.5. The regression equation is $0.612: B-G: -1.72$ Fit: -1.72.

The right side of the interface shows the workflow steps, including PHOTOMETRIC_COLOR_CALIB, and the status bar at the bottom indicates the image resolution: w:1024 · h:1024 · n:3 · f32 · RGB · 12.000 MiB · Modified.

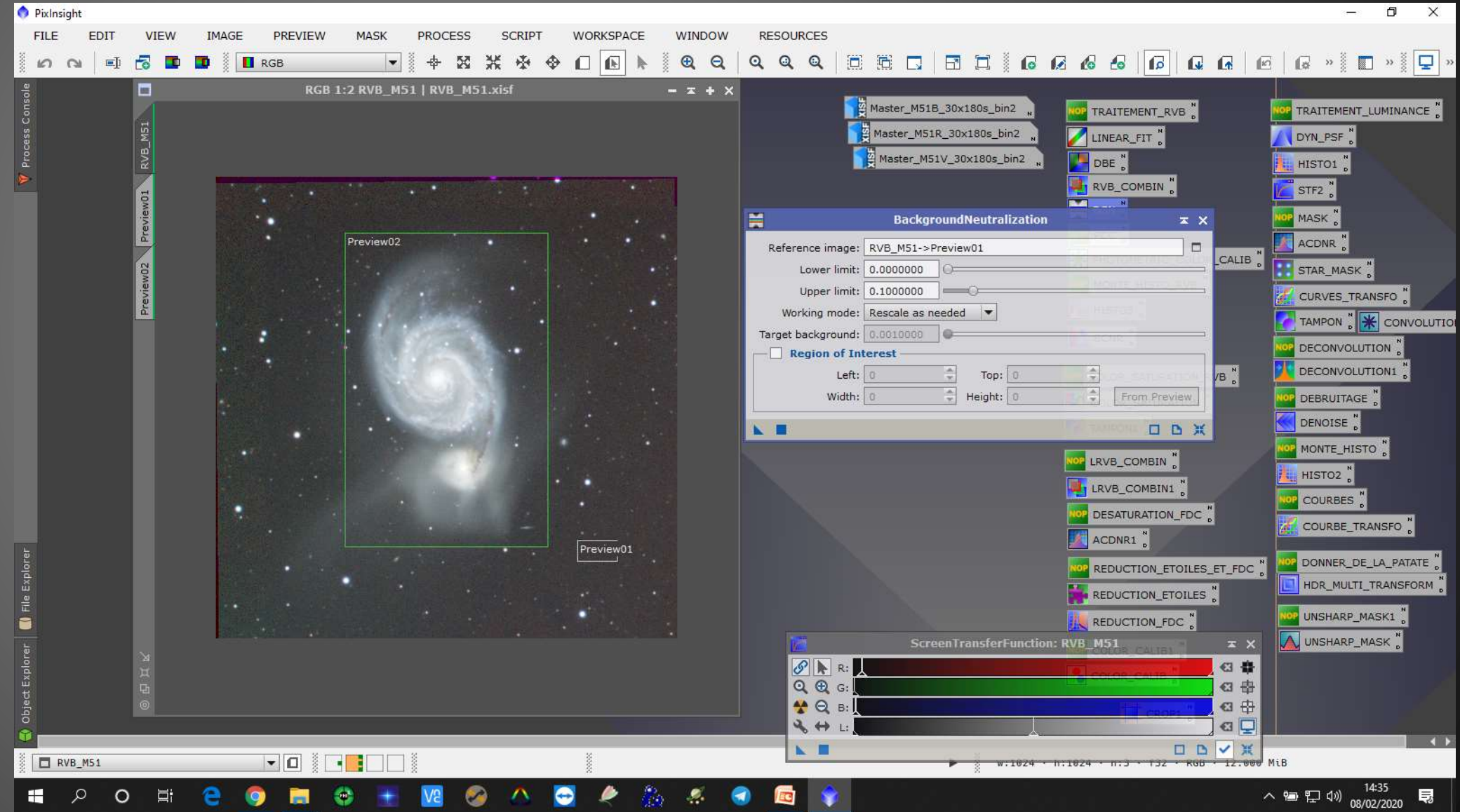
-On clic sur « link RGB chanel » et on clic sur « auto stretch »
Nous avons des couleurs calibrées d'après des données de database.



CALIBRER LES COULEURS (2nd METHODE)

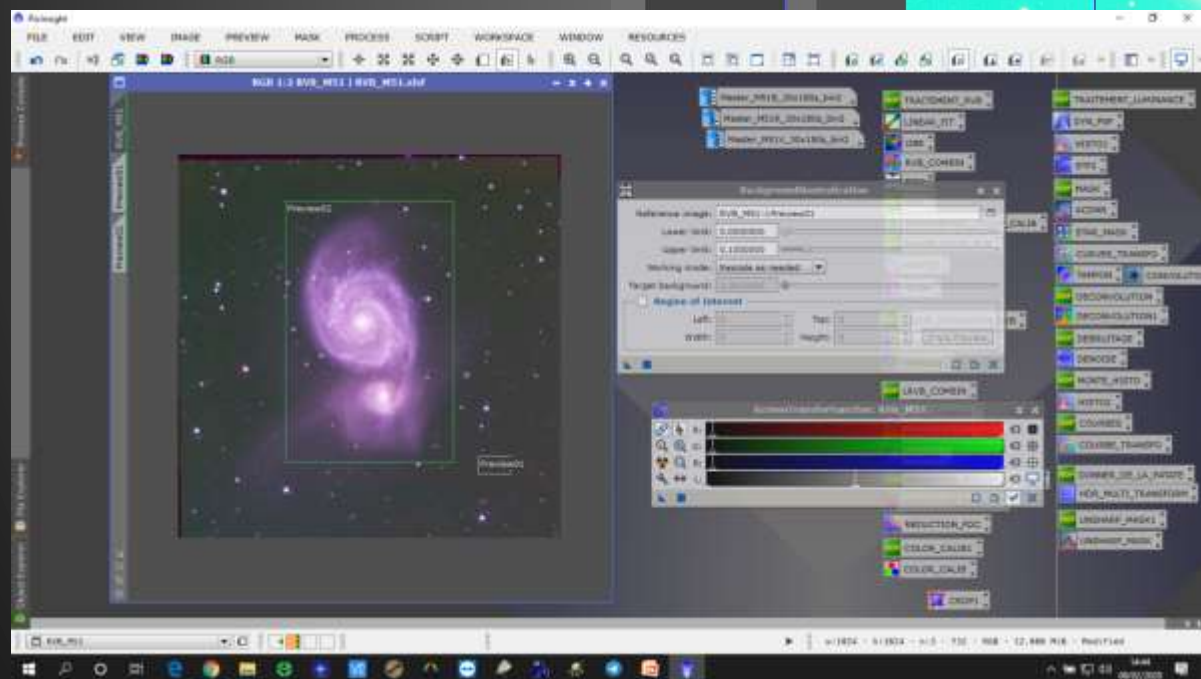
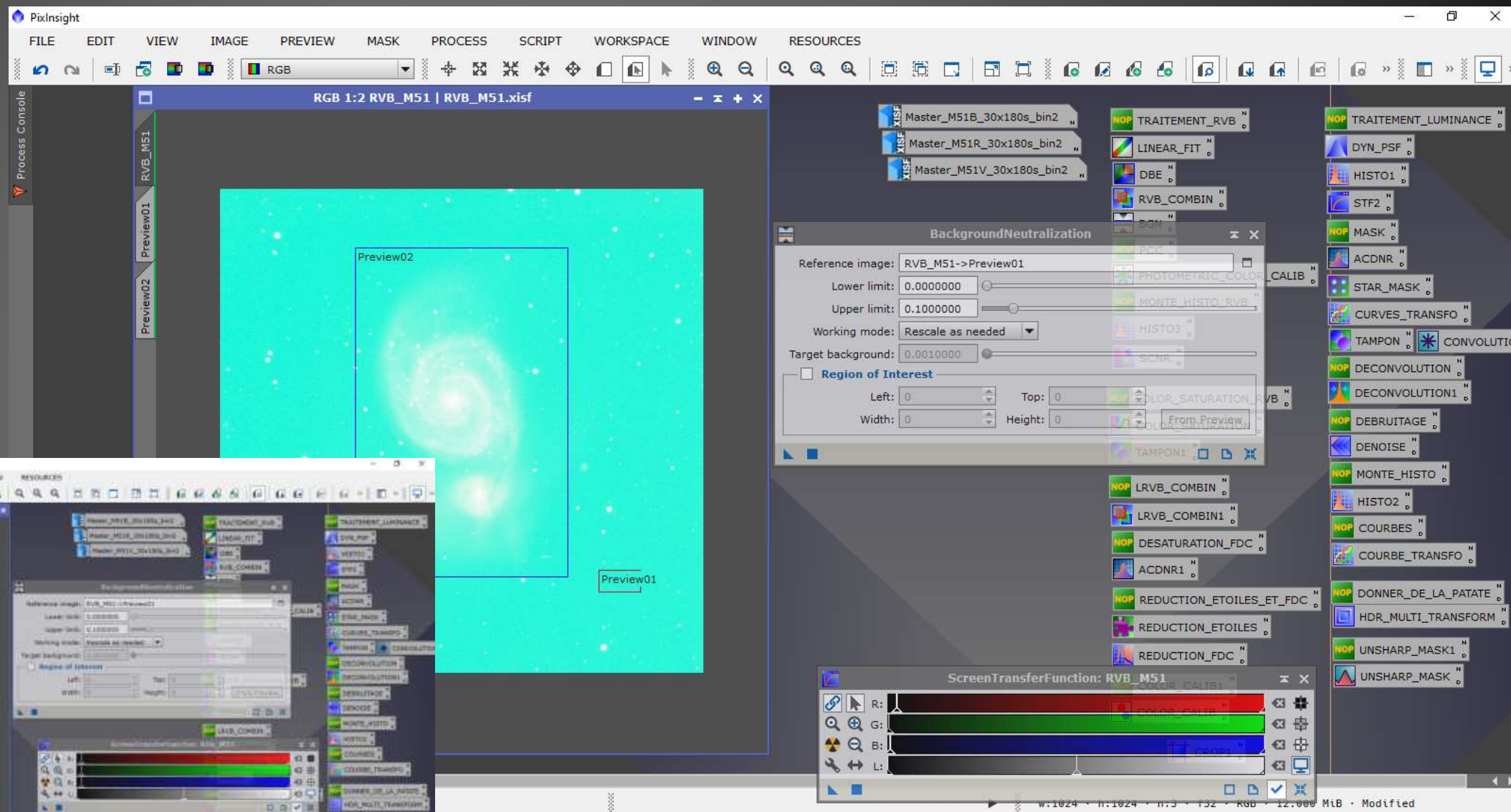
AVEC LES PROCESS : BACKGROUND NEUTRALISATION - COLOR CALIBRATION

- Faire 1 preview du fond du ciel et 1 preview de luminance (ce dernier servira après)
- Ouvrir le process « BackgroundNeutralization » et charger le preview du fond du ciel dans Reference image
- Appliquer le traitement



-On obtient une image avec un FDC neutralisé
-On clic sur link RGB chanel et sur Auto Strech

On obtient des couleurs bizarre mais c'est pas grave...



-Ouvrir le process « ColorCalibration »

-Dans White Reference charger le preview de luminance (celui de la galaxie)

-Dans Background reference charger le preview du fond de ciel

-Relever la valeur du fond du ciel dans l'image (ici nous avons 0.022)

-Dans Upper limit, veiller à ce que la limite (ici 0.1) soit supérieure à celle de la valeur relevée dans l'image.

-Appliquer le traitement

The screenshot shows the PixInsight software interface. The main window displays a galaxy image with two regions of interest: Preview02 (the galaxy) and Preview01 (the background). The ColorCalibration panel is open, showing settings for White Reference (Reference image: RVB_M51->Preview02, Lower limit: 0.000000, Upper limit: 0.900000) and Background Reference (Reference image: RVB_M51->Preview01, Lower limit: 0.000000, Upper limit: 0.100000). A ScreenTransferFunction window is also visible, showing color calibration curves for R, G, B, and L channels. The status bar at the bottom shows color calibration values: R:0.0220, G:0.0222, B:0.0223.

- On Stretch l'image et on obtient une image calibrée comme ci-dessous

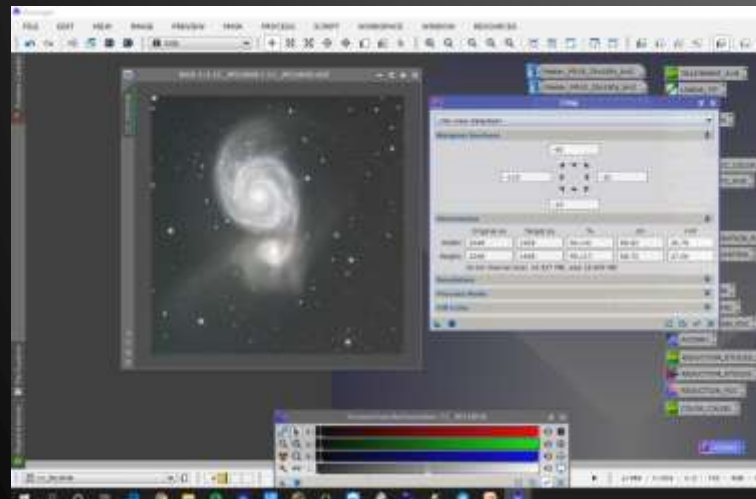


Screenshot of the PixInsight software interface. The main window displays a galaxy image with a green bounding box labeled 'Preview02' and a white box labeled 'Preview01' in the bottom right corner. The interface includes a menu bar (FILE, EDIT, VIEW, IMAGE, PREVIEW, MASK, PROCESS, SCRIPT, WORKSPACE, WINDOW, RESOURCES), a toolbar, and a sidebar with 'Process Console', 'File Explorer', and 'Object Explorer'. The 'ColorCalibration' panel is open, showing settings for 'White Reference' (Reference image: RVB_M51->Preview02, Lower limit: 0.0000000, Upper limit: 0.9000000) and 'Background Reference' (Reference image: RVB_M51->Preview01, Lower limit: 0.0000000, Upper limit: 0.1000000). The 'Region of Interest' and 'Structure Detection' sections are also visible. A 'ScreenTransferFunction: RVB_M51' panel is open at the bottom, showing color calibration curves for R, G, B, and L. The workflow stack on the right includes steps like 'TRAITEMENT_RVB', 'DYN_PSF', 'HISTO1', 'STF2', 'MASK', 'ACDNR', 'STAR_MASK', 'CURVES_TRANSFO', 'TAMPON', 'CONVOLUTION', 'DECONVOLUTION', 'DECONVOLUTION1', 'DEBRUITAGE', 'DENOISE', 'MONTE_HISTO', 'HISTO2', 'COURBES', 'COURBE_TRANSFO', 'DONNER_DE_LA_PATATE', 'HDR_MULTI_TRANSFORM', 'UNSHARP_MASK1', and 'UNSHARP_MASK'. The Windows taskbar at the bottom shows the time as 15:04 on 08/02/2020.

ELIMINER LE GRADIENT DANS DE L'IMAGE AVEC LE PROCESS : DYNAMIC BACKGROUND EXTRACTION

Avant de commencer ce traitement, nous avons croppé l'image car à l'empilement nous avons des bords dégueulasse !

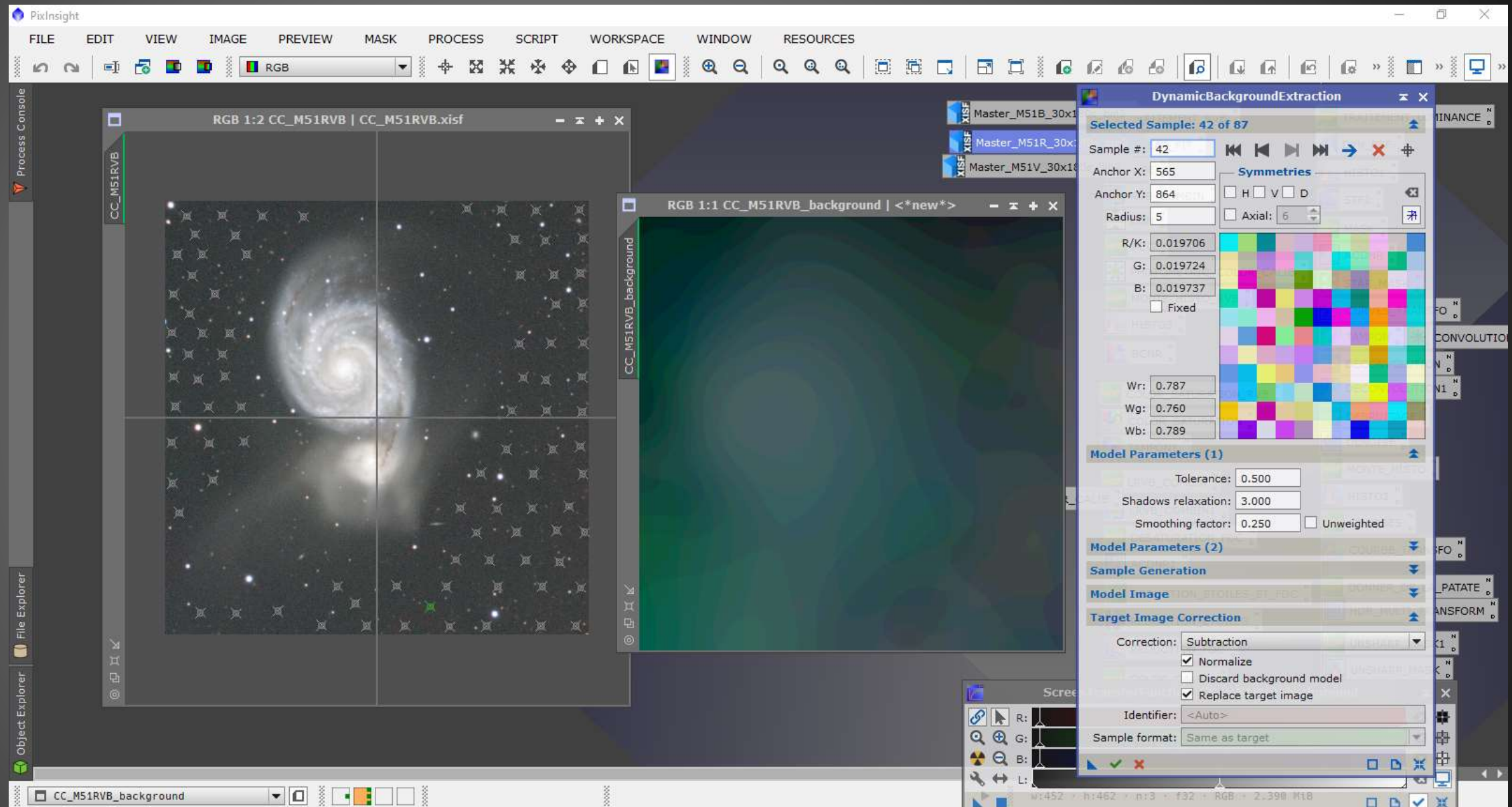
- Ouvrir le process « DynamicBackgroundExtraction »
- Placer des points dans le fond de ciel Attention à ne pas les placer sur les étoiles, des aigrettes ou bien dans l'objet
- Dans target image correction sélectionner Subtraction, cocher les cases normalize et replace target image
- Exécuter le process



A screenshot of the PixInsight software interface. The main window displays a galaxy image with a grid of points overlaid on the background, indicating the process of dynamic background extraction. The interface includes a menu bar (FILE, EDIT, VIEW, IMAGE, PREVIEW, MASK, PROCESS, SCRIPT, WORKSPACE, WINDOW, RESOURCES), a toolbar, and a process console on the right. The process console shows the 'DynamicBackgroundExtraction' process with various parameters and options. The 'Target Image Correction' section is expanded, showing 'Correction: Subtraction', 'Normalize' checked, 'Discard background model' unchecked, and 'Replace target image' checked. The 'Sample format' is set to 'Same as target'. The bottom status bar shows the coordinates '+1232.00' and '+778.00'. The Windows taskbar is visible at the bottom, showing the time '16:33' and date '08/02/2020'.

Une carte de dégradé du fond de ciel a été générée, et l'image a été uniformisée.

Nous obtenons une image avec un fdc bien propre.



FAIRE UNE MONTEE D'HISTOGRAMME DE L'IMAGE

The screenshot displays the PixInsight interface with a workflow for histogram transformation. The main window shows a dark image titled "RGB 1:2 CC_M51RVB | DBE_M51RVB.xisf". A "HistogramTransformation" dialog is open, showing two histograms: the top one is empty, and the bottom one shows a linear slope. The dialog includes a "16-bit (64K)" dropdown and "Lines" options. Below the histograms, the "CC_M51RVB" panel shows color calibration settings for R, G, and B channels, with sliders for Shadows, Highlights, Midtones, Low range, and High range. The right sidebar contains a workflow of processing steps, including "HISTO1", "HISTO2", "MONTE_HISTO", and "COURBES". The bottom status bar indicates the image dimensions and resolution: "w:904 · h:924 · n:3 · f32 · RGB · 9.559 MiB".

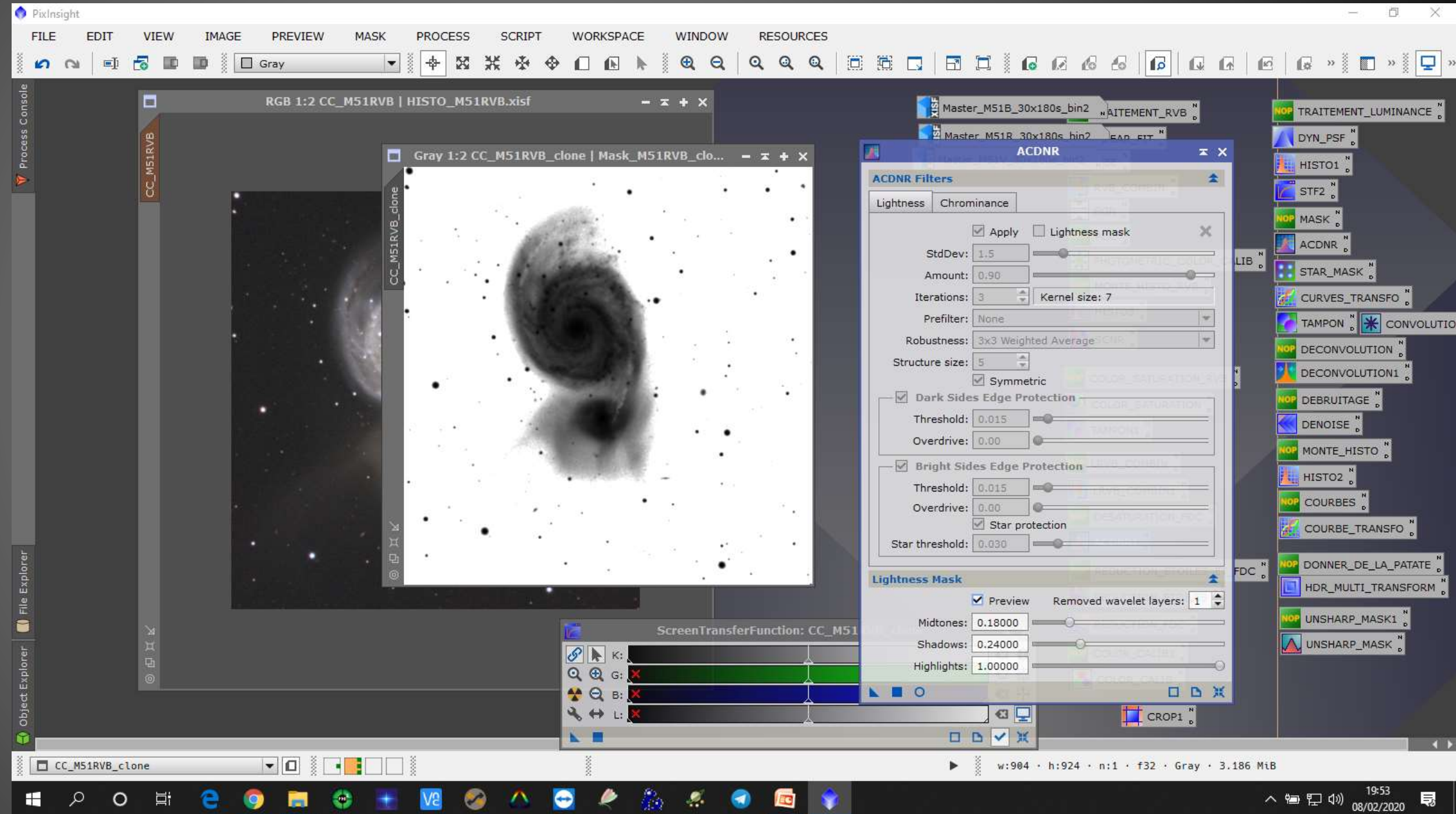
Avec le curseur du milieu et celui de gauche, monter l'histogramme en faisant toujours bien chevaucher les histogrammes de chaque canaux.

The screenshot displays the PixInsight software interface. The main window shows a galaxy image titled "RGB 1:2 CC_M51RVB | DBE_M51RVB.xisf". Overlaid on the right is the "HistogramTransformation" dialog box, which contains two histograms for the R, G, and B channels. The dialog also includes a "16-bit (64K)" dropdown, a "Lines" dropdown, and a "CC_M51RVB" channel selection. Below the histograms are sliders for "Shadows", "Highlights", "Midtones", "Low range", and "High range". The "Shadows" and "Highlights" sliders are set to 0.0000000 and 1.0000000 respectively. The "Midtones" slider is set to 0.5000000. The "Low range" and "High range" sliders are also set to 0.0000000 and 1.0000000. The "HistogramTransformation" dialog is open over a workflow panel on the right, which shows a sequence of processing steps including "TRAITEMENT_LUMINANCE", "DYN_PSF", "HISTO1", "STF2", "MASK", "ACDNR", "STAR_MASK", "CURVES_TRANSFO", "TAMPON", "CONVOLUTION", "DECONVOLUTION", "DECONVOLUTION1", "DEBRUITAGE", "DENOISE", "MONTE_HISTO", "HISTO2", "COURBES", "COURBE_TRANSFO", "DONNER_DE_LA_PATATE", "HDR_MULTI_TRANSFORM", "UNSHARP_MASK1", and "UNSHARP_MASK". The bottom status bar indicates the image dimensions are w:904 · h:924 · n:3 · f32 · RGB · 9.559 MiB · Modified.

SATURER LES COULEURS DE L'OBJET

Avant de venir saturer les couleurs de l'objet, il est nécessaire de créer un masque de luminance de la couche RVB

- Cloner l'image RVB
- Ouvrir le process « ACDNR » et dans Lightness Mask, bouger les curseurs Midtones et Shadows pour avoir l'objet bien noir et le fond de ciel bien blanc



- Appliquer le masque de luminance que l'on vient de créer. Il doit protéger le fond de ciel

- Ouvrir le process « ColorSaturation » faire monter le curseur.

The screenshot displays the PixInsight software interface with a workflow for processing a galaxy image. The main window shows a galaxy image with a histogram overlay. The workflow on the right includes the following steps:

- Master_M51B_30x180s_bin2
- Master_M51R_30x180s_bin2
- ColorSaturation (with Hue: 1.00000, Saturation: 0.32727, Hue shift: 0.000)
- ScreenTransferFunction: CC_M51RVB
- TRAIITEMENT_RVB
- EAR_FIT
- RVB_COMBIN
- BGN
- PCC
- PHOTO
- MONT
- HISTO
- SCNR
- SATURATION_RVB
- SATURATION
- COMBIN
- COMBIN1
- DESATURATION_FDC
- ACDNR1
- REDUCTION_ETOILES_ET_FDC
- REDUCTION_ETOILES
- REDUCTION_FDC
- COLOR_CALIB1
- COLOR_CALIB
- CROP1
- TRAIITEMENT_LUMINANCE
- DYN_PSF
- HISTO1
- STF2
- MASK
- ACDNR
- STAR_MASK
- CURVES_TRANSFO
- TAMPON
- CONVOLUTION
- DECONVOLUTION
- DECONVOLUTION1
- DEBRUITAGE
- DENOISE
- MONTE_HISTO
- HISTO2
- COURBES
- COURBE_TRANSFO
- DONNER_DE_LA_PATATE
- HDR_MULTI_TRANSFORM
- UNSHARP_MASK1
- UNSHARP_MASK