



Step-by-step guide for the FITS Liberator, to making your own images with Photoshop Elements 8 / Windows 7.

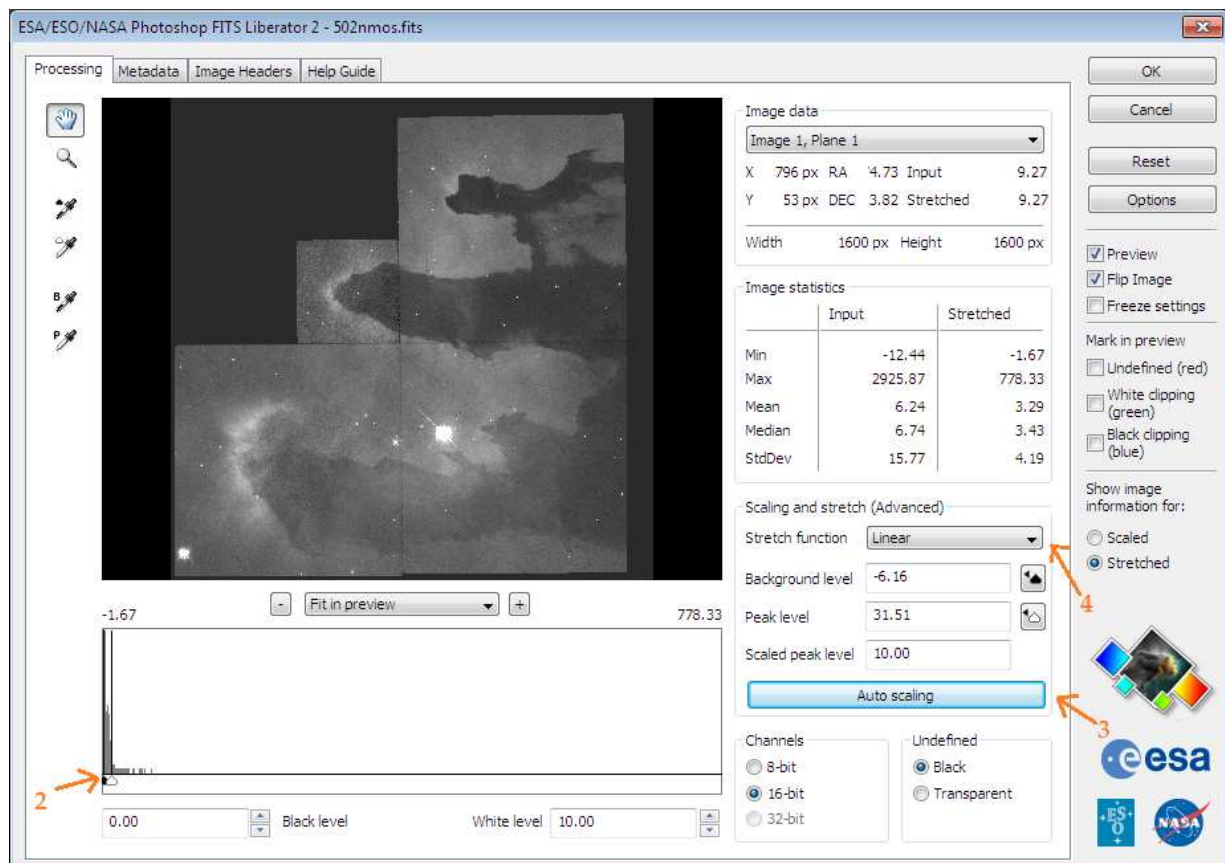
Using the Photoshop FITS Liberator plug-in.

Step 1: Download and install the FITS Liberator plug-in.

Look at: http://www.spacetelescope.org/projects/fits_liberator/

Step 2: 'Liberating' the FITS format images.

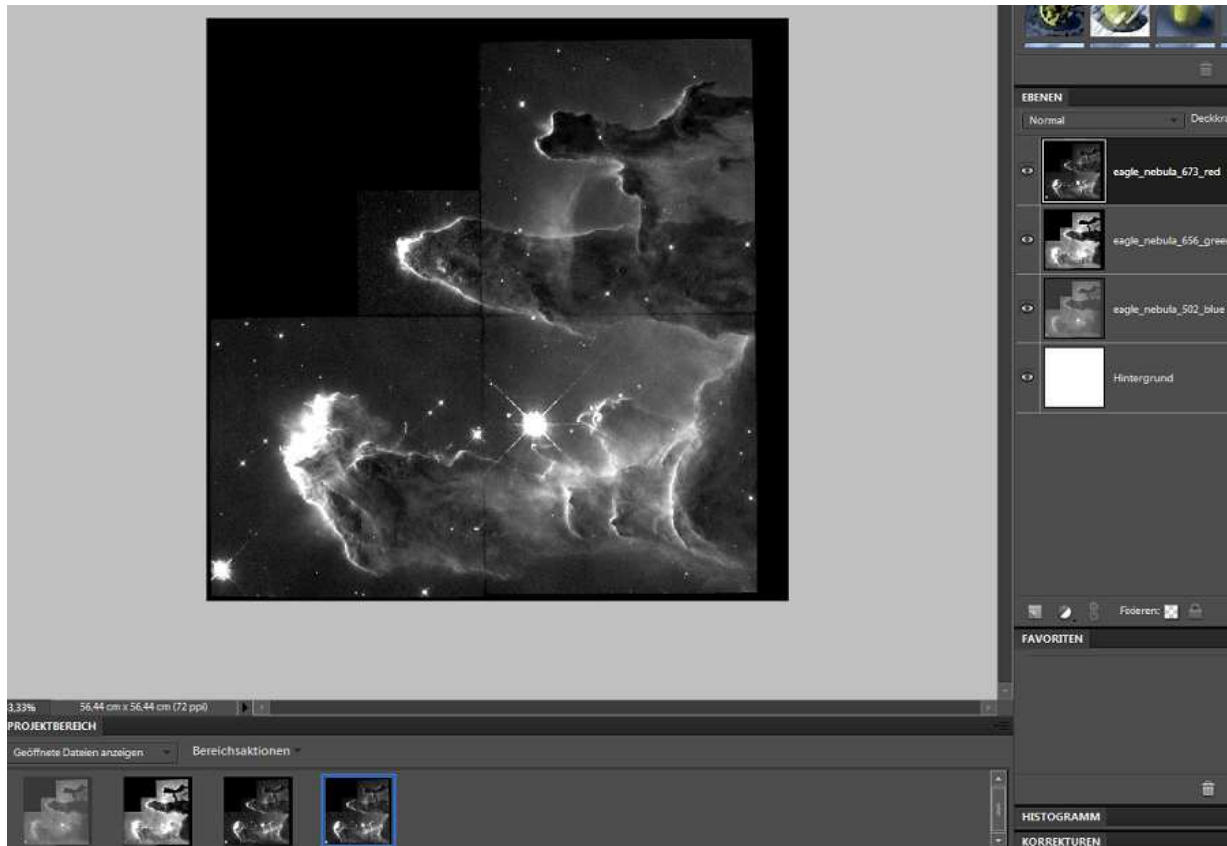
1. Open the images one by one in FITS Liberator.
2. Set the White and Black level sliders in the histogram to give a nice contrast without too much black and too saturated areas.
3. Click Auto Scaling.
4. Try different Stretch functions to enhance fainter parts of the image.
5. Click OK.
6. Repeat for the other images in the same dataset.



Now you have 'liberated' the data from the FITS format, the rest is hard work in Photoshop.

**Step 3: Assemble the different exposures into different layers of the same image.**

You should now assemble the three images into one file. If the layer window does not automatically open, you can activate it through window -> layers (or by pressing F7).



- Create a new image.
- One way of doing this is: select all in one image (short cut: **Ctrl+a**) - then "copy" (**Ctrl+c**). Choose another (new) image. Paste (**Ctrl+v**) the first image into the next image. This will create another layer in the first image, so you now have two images together in each their layer.
- **Rename the layers** as you paste them as there are usually little visual difference between exposures (just double click on the name). Give them logic names like "656nmos-green".
- Repeat with the third image, so you get all three images together in the same window, just in each their layer.
- The layers should be in chromatic order, the **first layer** will be **blue**, so put the file corresponding to the lowest wavelength in the first layer, the middle wavelength (**green**) in the second layer and the highest wavelength in the **last layer** that will become **red** (the layers are counted from the bottom of the screen and up).
- Note that users of **Photoshop Elements** have to convert the layers to **8 bits/channel** first with: Image -> Mode -> Convert to 8 bits/channel

If you have accidentally gotten the layers in the wrong order, you can drag them up and down as appropriate.



Save time and trouble

The action you can download from our download page takes care of step 3 through 7. So if you play the action, you can then go ahead to step 8. This will save you a lot of work. **This action doesn't work with Photoshop Elements 8.**

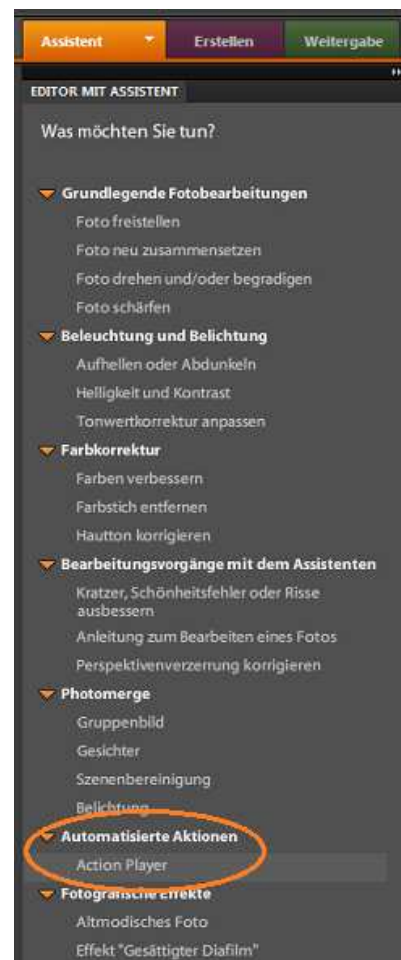
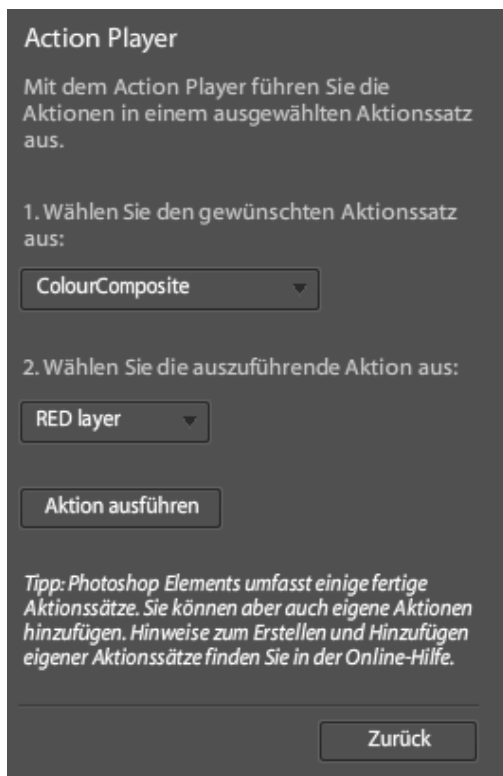
- So unless you are really interested in Photoshop detail, we recommend you play the action and then proceed to step 8.

On the download page there is a short description on how to load and play the action:

Store the action file in: C:\ProgramData\Adobe\Photoshop Elements\8.0\Locale\de_DE\Workflow Panels\actions

A Photoshop CS2/CS/7.0 "Action" for producing color images from a Photoshop file with three grayscale layers (save the file in your Actions directory).

- Load the Action: In the Action Window (Window -> Action) select Load Actions -> /static/projects/fits_liberator//static/projects/fits_liberator/Colour_composite.atn (the small arrow in the upper right corner)
- Open e.g. three (aligned) grayscale exposures of the same object in Photoshop.
- Copy the three files into three layers of the same file.
- For each layer:
- Select the layer, for instance the Blue layer
- Play the "Blue Layer" part of the Action.
- Answer "Don't Merge", if that question comes.
- Adjust layers as appropriate.

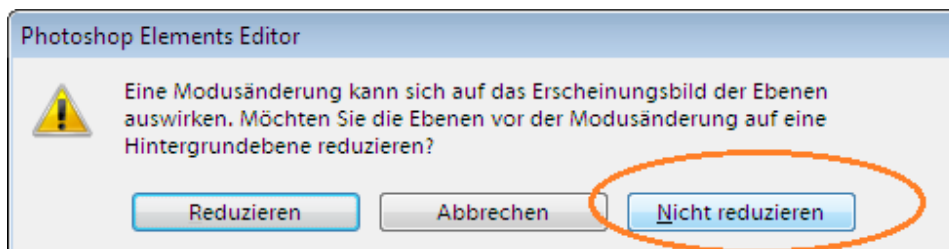




Step 4: Change mode to RGB.

The grey scale images should now be converted to RGB images.

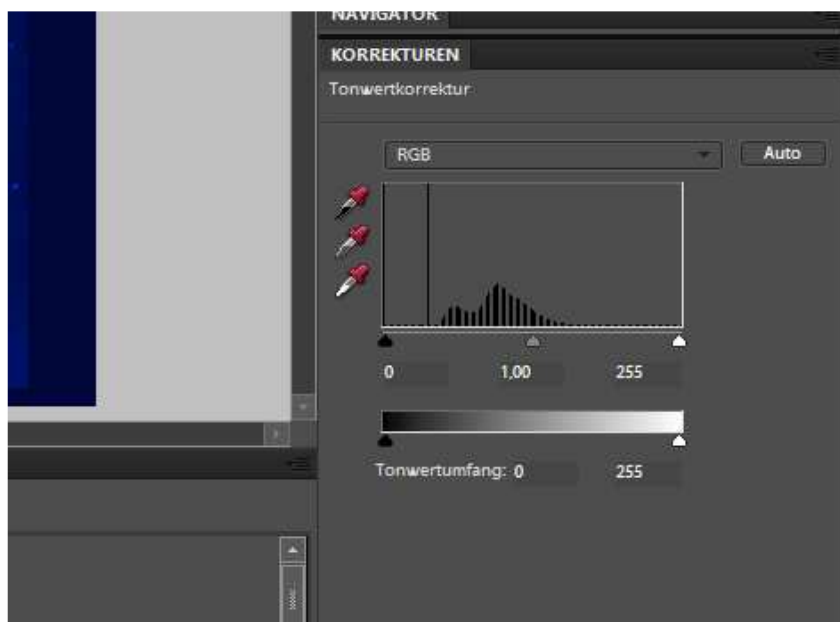
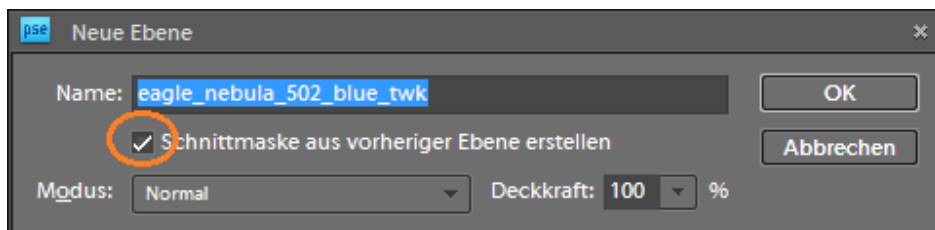
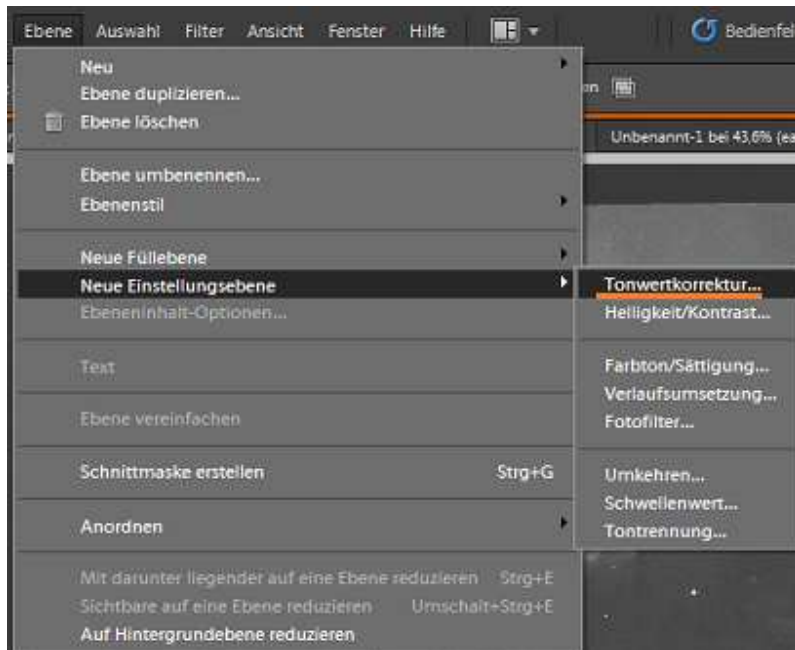
- Do this by choosing image -> mode and then choose RGB as shown in the illustration.



Step 5: Making a level adjustment layer.

Now it is time to add some adjustment layers that allows you to change the intensities and color of the layers. Having these as individual layers makes it easy to go back and re-adjust some settings later on.

- Choose a layer by clicking on it.
- Then add an adjustment layer by choosing Layer -> New Adjustment Layer -> **Levels (German: Tonwertkorrektur)**, as is shown in the illustration.
- Remember to check the box "Use Previous Layer to Create Clipping Mask" (or "Group with previous layer" in Elements 2.0). If you forgot, delete the layer and make it again.
- When the Levels dialogue box appears, you can slide the markers appropriately or wait and do this later.

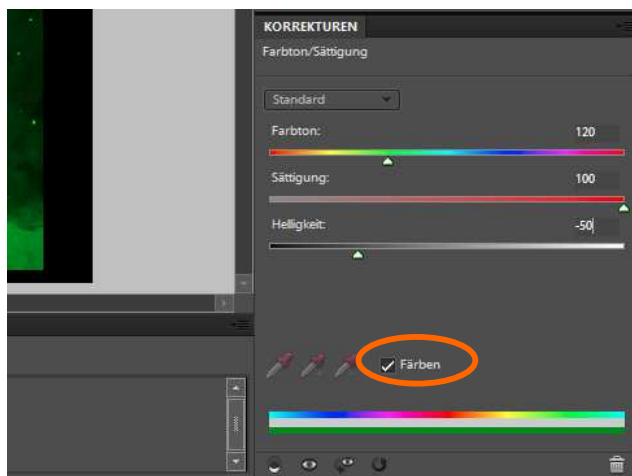
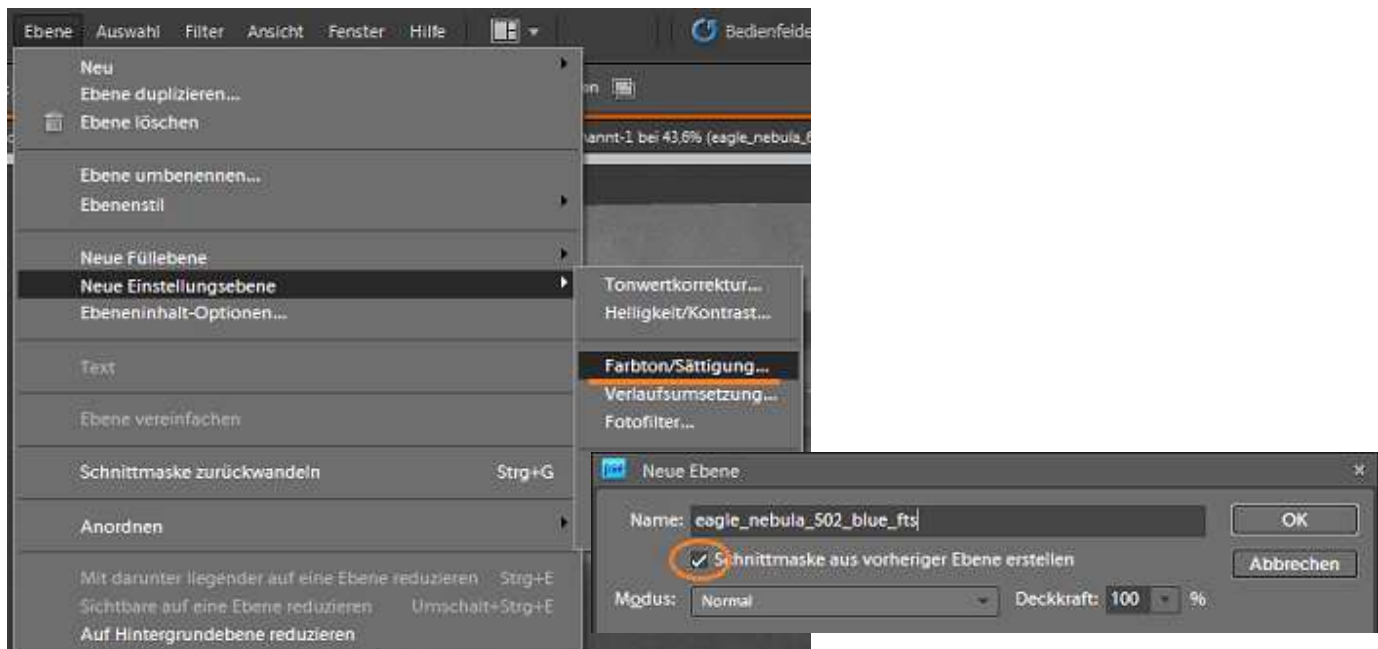


**Step 6: Making curves and hue adjustment (German: Farbton/Sättigung) layers.**

- Add another adjustment layer, this time choose Curves (not available in Elements 8.0).
- Also check the box "Use Previous Layer to Create Clipping Mask" (or "Group with previous layer" in Elements 2.0).

Curves do the same as the stretch function earlier, but here it is possible to manipulate the stretch function by dragging the curve. Curves should be used with care. The main strength of this tool is its ability to emphasize either the light or the dark part of an image.

- Add a third adjustment layer, Hue/Saturation (**German: Farbton/Sättigung**).
- Here you must also check the box "Use Previous Layer to Create Clipping Mask".





According to the layer you are making the adjustment layer for, choose the following values:

<u>Colour (Farbe)</u>	<u>Blue</u>	<u>Green</u>	<u>Red</u>
Hue (Farbton)	240	120	0
Saturation (Sättigung)	100	100	100
Lightness (Helligkeit)	-50	-50	-50

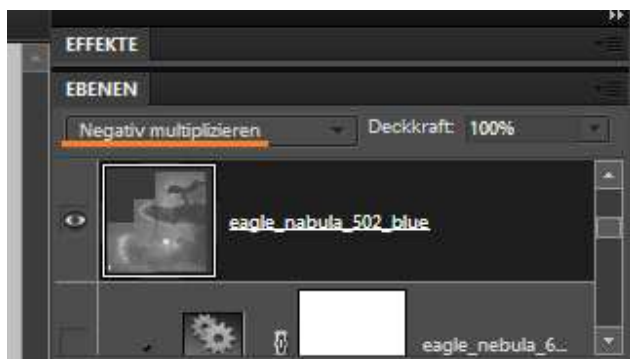
These values correspond to the primary colors of the RGB system in Photoshop. It is important to check the box "colorize" when the curves dialogue window pops up.

Repeat step 5 and 6 for the other two original layers, so you end up with three correction layers for each of the original layers.

Step 7: Making the layers transparent to see all the colors.

- For each of the original layers (the exposures themselves), the mode should be set to "**screen (German: Negativ multiplizieren)**", as it is done in the illustration.
- For each of the linked adjustment layers, the mode should be set to "**normal**", as it is done in the illustration. This is where you can spend a lot of time later selecting the best mask to suite the final image detail and blend. Changing between "Normal" and "Overlay" or "pin light" etc for example can have a dramatic effect. Also the sliders on the output can be moved to find the best detail, but for the start you may want to just use the "auto" setting.

This will make the layer transparent, and it is the equivalent of having the three different layers behaving as slides instead of as paper images.





Step 8: Making the image look good

- If you used the action, or if you did not touch the sliders during the manual operation, you should now go into each of the different correction layers and **balance the colors**. You do this by double clicking on each of the nine correction layer.

Generally it is advised to get as large a dynamic range as possible in the image, but much of this work is all a question of taste. Now you should have a nice, well balanced color image on your screen and it is time for some real fun! (Now is a good time to **save your image** if you have not done this so far!).

- Try for instance to remove some of the corrections by clicking on the "eye" to the left of the level. Put it back by clicking again. You can also redo the corrections by clicking on the appropriate correction level.

When you decide you cannot use more time on this fine tuning, you might have an image that looks somewhat like this figure.

Step 9: Cropping (German: Freistellungswerkzeug)

The image will definitely look better if you **crop** it.

- Pick the cropping tool in the toolbox in the left side of the screen. Mark the area you want to keep, and choose "crop" in the image menu (or double click inside the selection)
- You can compare your result with the draft image to the right (made by a professional).





Step 10: The result.

