

## Image processing with Gimp: Part 3

# LAYER BY LAYER



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**This time we'll be dealing with layers. Layers are the method of choice when it comes to organising and arranging image data easily.**

So far we have always been familiar with images as a screen full of pixels. Most of the slightly more ambitious image processing programs on the other hand offer another method for flexible handling of various image elements - layers. Imagine layers as transparent sheets of film. An image consists of several films which are laid one on top of the other in a pile. The films have transparent areas through which the underlying films become visible.

Let's take a look at a simple example of how to work with layers. Start Gimp and open a new image. Use `<Image>/Dialogs/Layers, Channels and paths...` or `[Ctrl+L]` to open the central control point for working with layers (See Figure 1).

The main part of the dialog is the white area in the middle. Here you can see the individual layers listed line by line. The eye at the beginning of the line shows whether the layer is visible at the moment (with a click on this you can make a layer invisible), the cross indicates coupled layers, which can only be moved together. Then follows a small preview,

which is sufficient for a rough orientation, and finally the name of the layer. It is worthwhile, especially when there are lots of layers, to select meaningful names – with a double-click on the name, a small dialog opens in which you can change the name.

The current layer is marked in blue. All painting operations and every plugin command works on this layer. With a single click on the preview or the name of the layer you can change to another layer with which you'd like to work.

At the lower end of the dialog you will see six buttons, with which you can execute basic layer operations. With the first button you create a new layer, the second and third buttons move the layer up or down, the fourth creates a copy of the current layer, the fifth anchors a **floating selection**, and the sixth deletes a layer. Other important operations can be found by clicking with the right mouse button on the layer names.

Figure 1: The dialog for layers, channels and paths



## A hard shadow

Sometimes you want to make an image or a graphical element stand out a bit from the background. A standard procedure for this is to lay a hard shadow behind the element. And now you can learn how to do this; this is a good way to start learning how to work with layers. Create a new image, for example 500x500 in size.

Open the layers dialog and click on the bottom left button, to create a new layer. In the dialog that appears, select a **transparent** background, name it anything you like and accept the default size. After a click on **OK** the second layer in the layers dialog appears. Transparency in Gimp is symbolised by a grey chessboard pattern. Since the layer is empty, nothing changes in the image window.

Paint in this layer as you like with the painting tools. Make sure a few areas remain transparent, so that later the effect can be seen (Figure 2). Duplicate the layers by clicking on the fourth button (the one with the two sheets of paper). Now make the upper layer invisible by clicking on the eye symbol and

activate the middle layer with a click on the name. Then activate the *Keep transp.* button in the upper area of the layers dialog. This will protect the transparency of the layer. Similarly to the first part of our workshop, you can now paint around the image in black and the form of the motif is retained.

To create the hard shadow, we now completely fill the motif with black. The fastest way to do this is to use drag & drop. Click in the colour fields of the toolbox on the small black-white symbol, in order to reset the colours, then press (and hold down) the mouse button in the black colour field and drag the colour into the image window (Fig. 3). Since the transparency of the layer is currently protected, the contours of the motif are retained.

Now activate the *Move* tool (the one with the compass rose as symbol), click in the black area of the layer and drag the layer a few pixels down and to the right. If you now make the uppermost layer in the layers dialog visible again, you will see a shadow-like effect (Figure 4).

But since it is in the nature of shadows that they are rarely so sharp-edged, we shall now dot the i: Make sure the middle layer is activated and turn off the transparency protection. Then select *<Image>/Filter/Blur/Gaussian blur (IIR)...* and a radius of 10. Now the shadow gets a soft edge that fades out (Figure 5).

Since we have spread our image over three different layers, it is possible to move the shadow later to change the direction of illumination. You can make it even softer by reducing the covering power of the shadow layer. To do this, use the slide ruler in the upper part of the layer dialog.

## Lighting effects

It is possible to achieve lighting effects in exactly the same way (preferably against a dark background). In Figure 6 you can see a spiral, which we have made glow with the above technique.

Duplicate the layer with the spiral three times. Activate *Keep transparency* in each of the middle three layers and fill in the second layer with white, the middle one with a luminescent turquoise (#00ffff) and the fourth layer with a luminescent green (#00ff00). Now deactivate the transparency protection again.

With the very useful *Gaussian Blur* plugin, you can make the middle three layers go out of focus. For example, try the radii 5 for the white, 10 for the turquoise and 20 for the green spiral. As a result we get a pale bluish luminescent spiral.

To strengthen the green luminescence a bit now, activate the layer with the green spiral. With *<Image>/Image/Color/Curves...* activate the curve tool which will be familiar from the last part. From the top list here, select the **Alpha channel** and drag the middle of the curve upwards slightly. This makes the semi-transparent area of the layer a bit stronger, and the luminescence becomes more visible (Figure 7).

Contrary to the hard shadow from above, here we have done without displacing the layers with the glow

**Floating selection:** we came across this in the first part, in a general way, stating only that a floating selection can be moved back and forth without destroying the underlying image data. Here you can now see what's really going on behind it. A temporary layer is being made. This is treated separately and merged back into the image as soon as the floating selection is anchored. With the layers dialog you can also create a real layer.

**Transparency:** If an image consists of several layers, all (except perhaps the lowest) automatically have an alpha channel, meaning that each pixel has, in addition to the Red/Green/Blue colour information, an additional value, representing the covering power (from 0 to 255). Also, each layer has a global covering power, which affects all pixels of this layer and defines the maximum covering power. It is defined using the sliding ruler in the layers dialog.

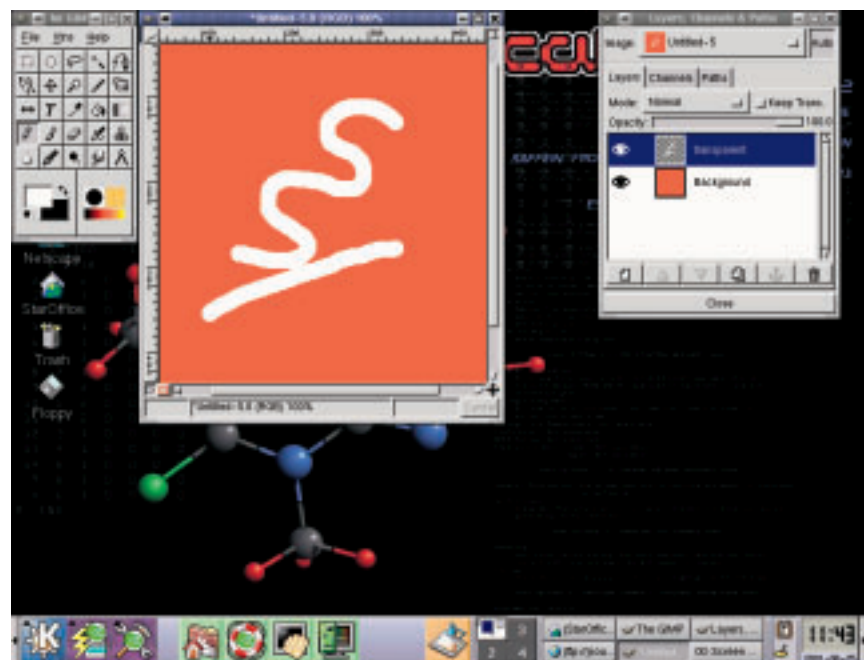
effect. Obviously this is easy to do. But a small problem arises here, in that the three layers with the different luminous colours should not really be displaced with respect to each other. So as not to have to move each layer individually by exactly this same distance, you can click on the area between the eye and the preview and make a cross visible. This cross means that this layer will also be moved in all actions with the *Move* tool.

To move all the layers with the luminous effect in parallel, activate this cross on all the affected layers. Activate one of these layers and move all the affected layers together. A little tip: The *Move* tool always moves the layer with a picture element under the mouse pointer. In case of doubt, this is the background layer. If you do not want this, hold down the [Shift] key and the activated layer will always be moved.

## Masked

To further confuse matters, apart from the two options addressed in the keyword **Transparency** of defining transparency, there is also a third – the layer mask.

Figure 2: A layer in front of a solid background



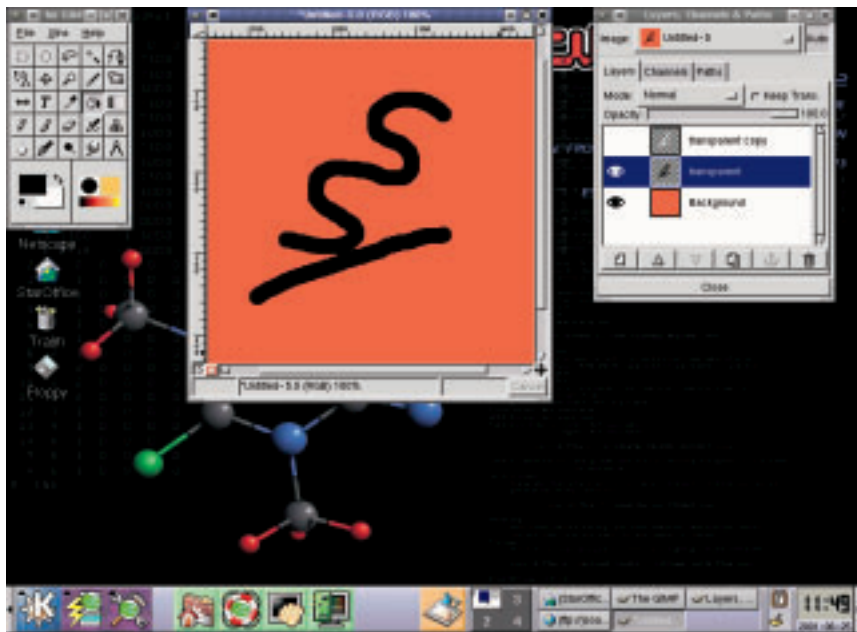


Figure 3: Fill the layer using drag'n'drop



Figure 4: A sharp hard shadow looks more artificial...



Figure 5: ...than a soft-focus shadow

The layer mask is a separate greyscale image, which can be used in addition to the normal alpha channel to make certain areas of the layer transparent. A layer mask is created with *Add layer mask* in the context menu in the layers dialog. Now you will see a second preview image, and with the mouse one can, by clicking on the respective preview image, select whether to paint in the layer or the layer mask.

Using the tiger image from last month. We now want to **release** the tiger, so that he can more easily be transplanted into a different environment. Load the image into Gimp and give it an alpha channel, via `<Image>/Layers/Add Alpha Channel`. Now you can paste a layer mask onto the image in the layers dialog via the context menu. Right click on the image in the layers list and choose the *Apply Layers Mask*. In the dialog which appears, select *White (full covering power)*. If you now paint in the image with black as foreground colour and any painting tool, the image becomes transparent at the

### The author

*Simon Budig would like readers to approach him with topic requests – otherwise this series will soon peter out...*

corresponding places. making sure that the black background is not invisible with no eye symbol against the layer

What's interesting about this is that the original image data are not altered by this. If you paint with white as foreground colour in the layer mask, the original image reappears. So you can snip away, without destroying the image, until the desired contour can be seen, and in Figure 8 you can see the first steps. Incidentally, it is advisable to appraise the contour against both a black and a white background. Perfectionists will also view it in front of other colours.

If one now has several image elements released in this way, these can be combined any way you like and you can also create abstruse images. Flying fish in the middle of a primeval jungle are no longer a problem. At this point, drag and drop within Gimp also comes in handy. By dragging the layers out of the layers dialog into different image windows, one can copy them simply into other images.

### Transparent GIFs

At this point we must address a very frequently asked question: How does one use Gimp to create **GIFs**, which are transparent at certain places? Lots of people come to grief at the point at which they want to define the transparency colour.

The answer is simple: you don't even need to define a transparency colour – Gimp does it for you. If a certain area of an image is to be transparent, give the image an alpha channel and etch some holes, for example, in the image. If the image is then saved as a GIF, Gimp will ensure that one colour is reserved for the transparency.

Bear in mind that in this process, information is lost. Gimp can save several degrees of transparency in its own format, while the GIF format can only handle completely covering or completely transparent pixels. If you have painted your image with nice soft contours, these will be lost when you export it in the GIF format (see Figure 9). Here, in some circumstances, help can be provided by the

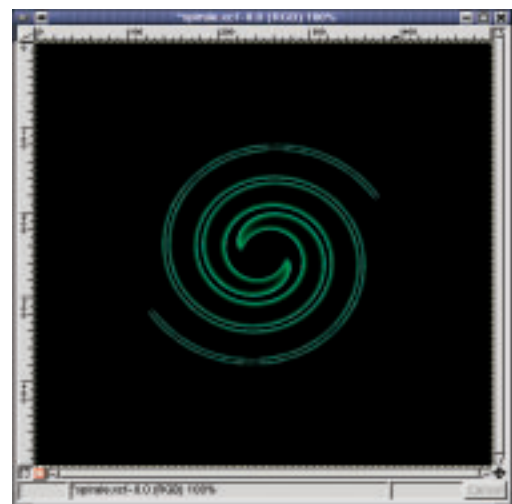


Figure 6: X Files here we come...

plug-in *Semi-Flatten* (<Image>/Filter/Colours/Semi-Flatten) to some extent: This plug-in ensures that all semi-transparent pixels (thus those which the GIF format would ruin) are made non-transparent, by counting them against the background colour. If one has selected a colour here which matches the "average" colour of the web page background, this effect can be considerably weakened.

In Figure 9 the three different variants can be seen. At top left there is a brushstroke with clean anti-aliasing. In the middle this stroke has simply not been converted into the GIF-type indexed format of Gimp (colour chart with maximum of 256 colours). The clean edge has given way to steps. On the right below the brushstroke has been prepared, with the Semi-Flatten plug-in, for a web page with a scarlet background. Of course one should now only show the image against a red background - otherwise it looks very ugly. But against a red background one can enjoy impeccable anti-aliasing.

## Future prospects

In the next part we will make a foray into the Gimp menus. We will look at a few gems among the plugins and see how these can be combined to make a few nice effects.

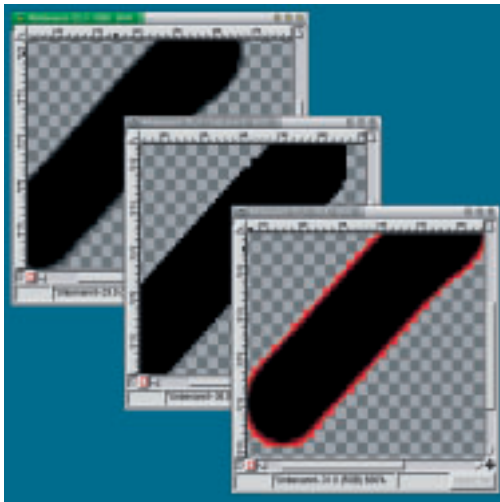


Figure 9: Problems with the alpha channel in GIFs

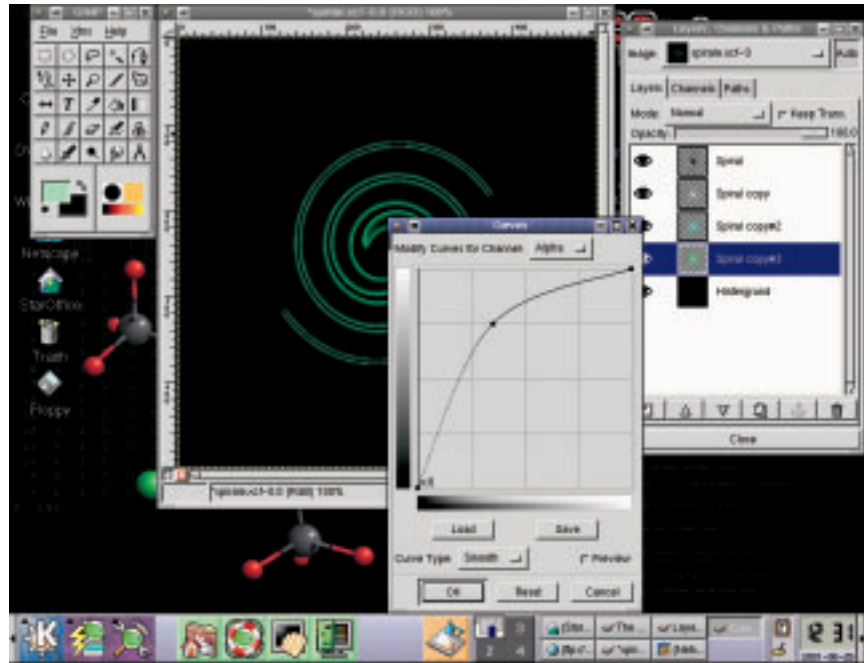


Figure 7: With the curve dialog, you can increase the glow

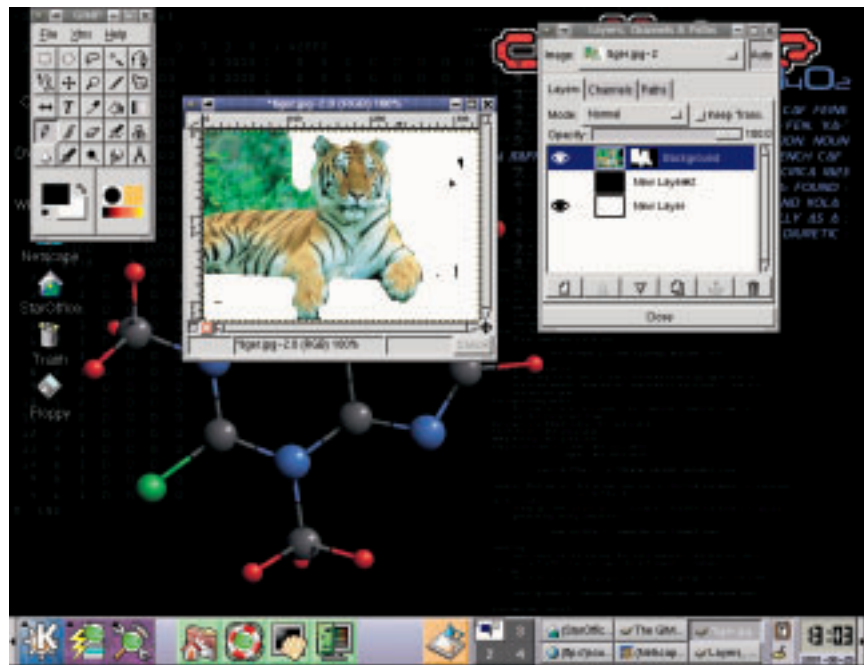


Figure 8: With the layer mask it is easy to release image elements

**Alpha channel:** refers to that part of a layer which contains information on transparency. The alpha channel can be manipulated deliberately (with the curve tool) or protected (Retain transparency in the layers dialog).

**Release:** is the name for the technique of separating a motif from the background. In our case the tiger is separated from the landscape. The main motif can then later be inserted into other images.

**GIF:** is a file format which is very widely used on the WWW. Images saved in the GIF format can define one (of the maximum 256) colours as "transparent". This means a pixel can be either transparent – or again, not. Gimp's model of transparency goes further: A pixel can have one of 256 levels of transparency. Since the GIF format unfortunately has a few licensing problems (LZW compression), you should avoid it as far as possible in your own web projects and instead use PNG or similar. Unfortunately support for PNG is not yet available in every web browser.