What are lens flares ?

https://en.wikipedia.org/wiki/Lens_flare

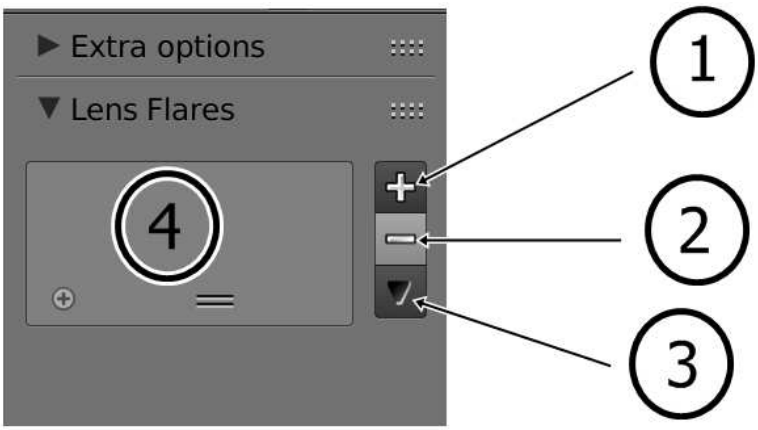
Flares Wizard is an addon for creating lens flares that looks realistic easily and quickly in the Cycles render engine.

Installation :

1- Open the user preferences, in the Add-ons tab press "Install from File" button, then locate the .zip file and hit enter or double click.
2- The add-on has now been installed you can find it in 3D View category, to enable it check the box to the right of the add-on.

How this add-on works :

After the installation, a new tab will appear in the 3D View > Tool shelf, named "Lens flares".



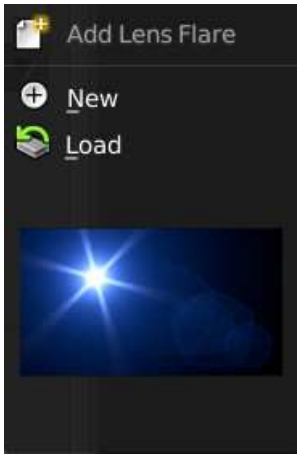
We have two panels:

Extra options: will talk about it later.

Lens flares :

where all the parameters and options for the lens flares are located.

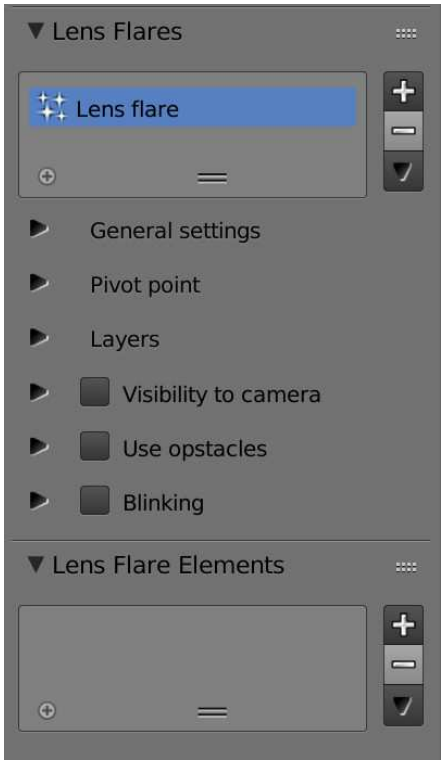
1- when you press the "+" button a list will appear with two options "New" and "Load".



New : To create a new lens flare, a camera in the scene and an active object are required, the active object we will call it **Target** from now on.

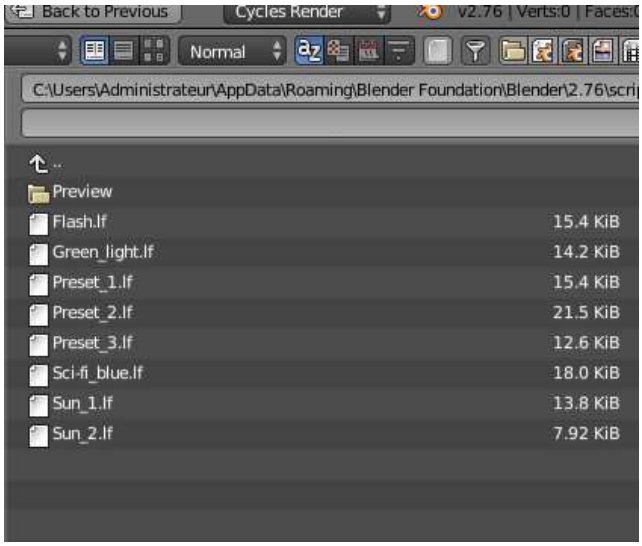
Once you click on "New" a Lense flare will be created.

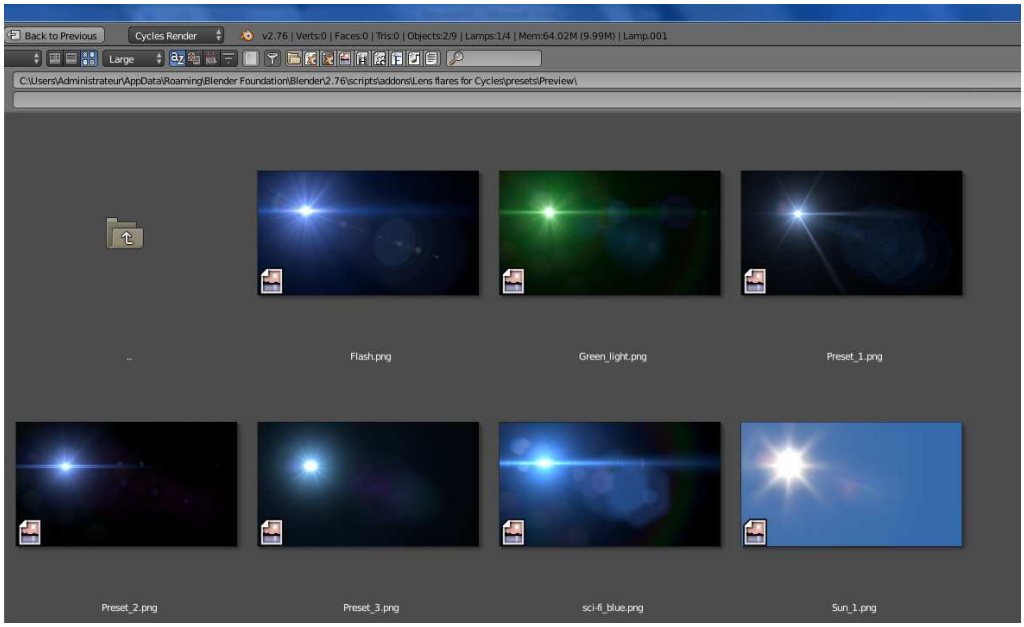
In the background a rig has been generated, and this new lens flare has been added to the list (4) named 'Lens flare' by default, you can double click on the name and change it, also we have new sub-panels (General settings, Pivot point, Layers, ...), and we have a new panel "Lens flare Elements".



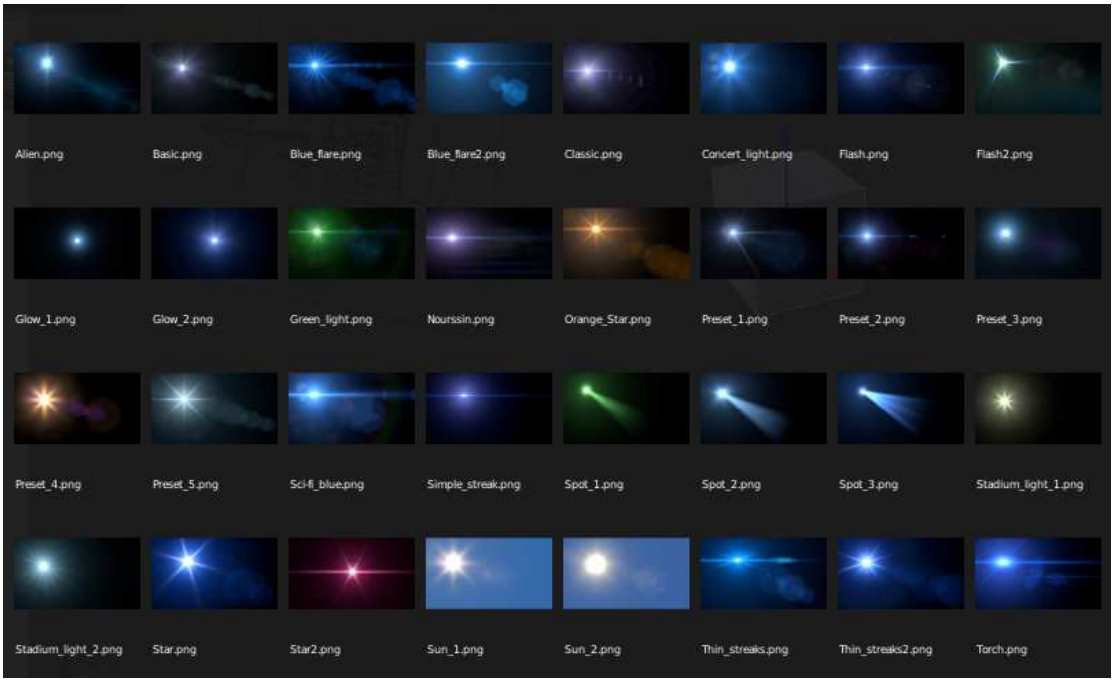
Load : for loading a preset, the add-on came with various presets, but you can also create your own.

When you click on "Load" the file browser will appear to choose a preset, however, if you want to see how the preset looks go to the "Preview" folder located in the presets folder. The preset file ".lf" and the preview image have the same name, example: (Flash.lf and Flash.png) if you choose one of them and click Load will load the chosen preset.





Or you can use the previews list to load a preset.



2- The "-" button to delete selected Lens flare.

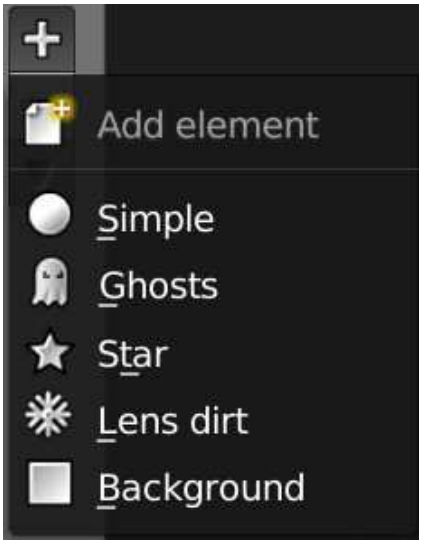
3- **Extra settings**, we have (Duplicate and Save).
Duplicate : to duplicate the selected Lens flare.
Save : to save the selected Lens flare .

4- The list of Lens flares.

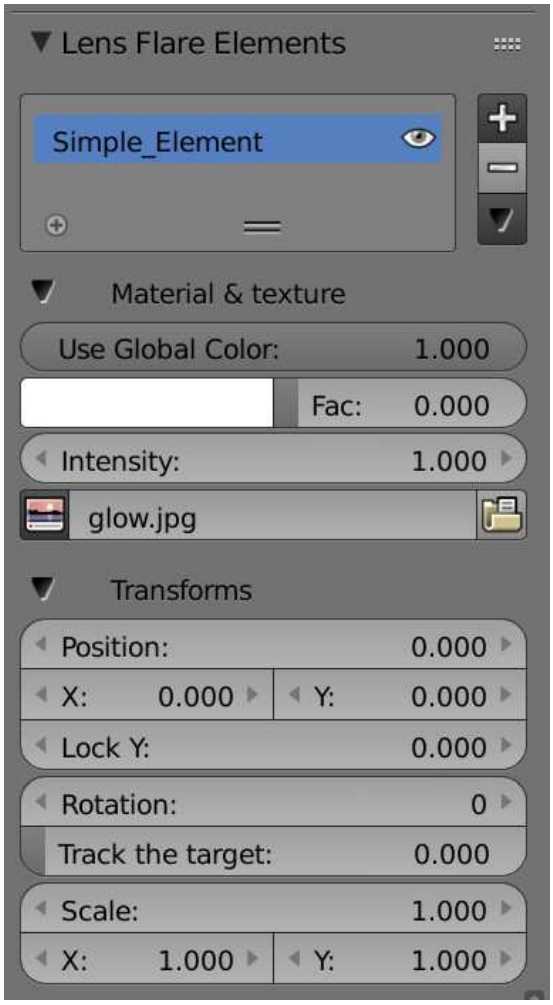
Lens Flare Elements

We could add as many Lens flares as we want.
Every Lens flare contain one or more element(s).
The element is basically a Plane object(s) with an image texture applied to it.
You can press the "+" button to add an element just like with the Lens flares.

There is 5 Types of elements :



- **Simple:** when you add a Simple element a Plane will be created in front of the Camera, if you switch to render mode (shift + Z) you will see a little halo, because that's the texture applied to the Plane by default.
  If you move the **Target** the element will follow it.



The element has many parameters separated in two categories.

A- Material & Texture :

1- **Use global color:** in the General settings you will find the Global color.
With this slider you can choose how much of the global color you want to use, to tint the element.

2- **Local color and its factor**

if you don't want to use the Global color, you have the option to give the element another color and also a Factor slider.

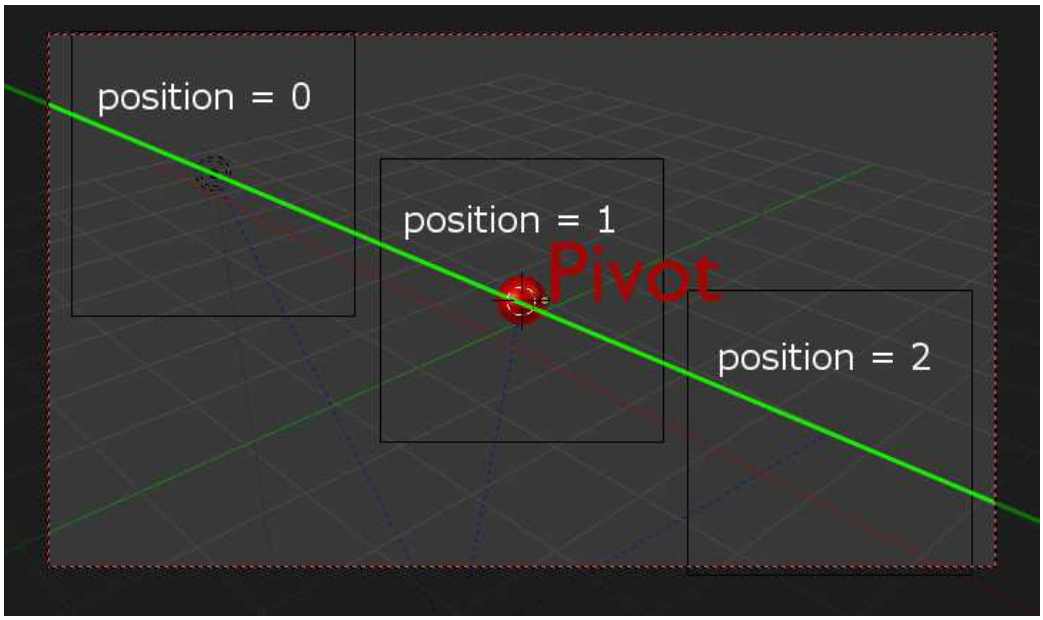
3- **Intensity :** the intensity of the element, to make it looks brighter.

4- **Open , select an image :**

The button with the folder icon to open an image.
The button in the left side is the list of available images.

B- Transforms :

1- **Position** : position of the element in a line between the Target's origin and the Pivot point, if the position = 0 it will be in the same location of the Target, position = 1 it will be in the same location of the Pivot.



2- **X location** : to move the element along its local X axis.

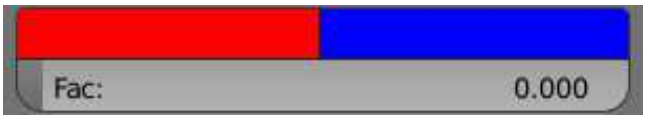
3- **Y location** : to move the element along its local Y axis.

4- **Lock Y :** to lock the movement of the element along the Y axis, useful for anamorphic lens flares.
5- **Rotation :** Rotation of the element in the local Z axis.
6- **Track the target :** the element will track the Target.
7- **Scale :** Scale of the element (X+Y).
8- **X scale :** Scale of the element along the X axis.
9- **Y scale :** Scale of the element along the Y axis.

- **Ghosts :** it's like adding a bunch of Simple elements, so the parameters are a bit similar. Ghosts in real life are: circular or semicircular orbs of different size, color or shapes that usually appear in a direct line from the light source and can span the whole image, with dozens of different artifacts. source
  Those are the parameters that are different from the Simple element:

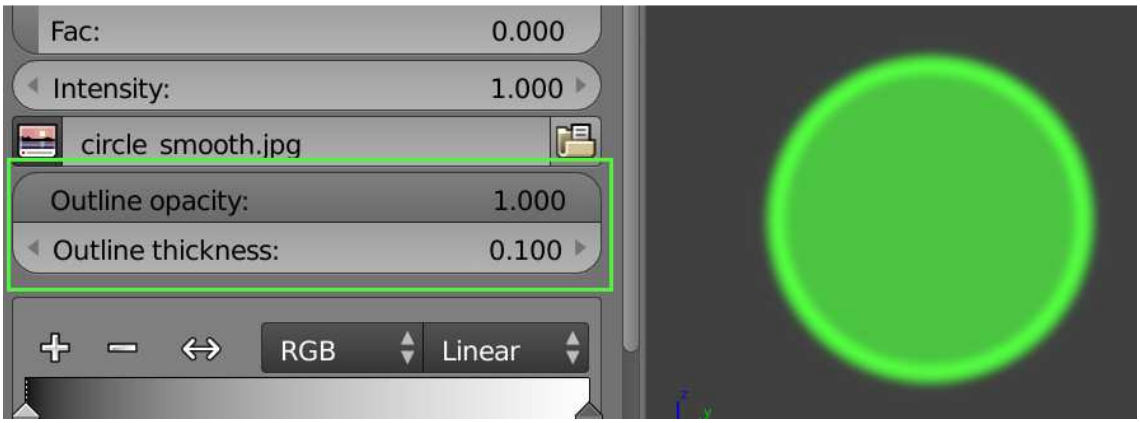
  A- Material & Texture :

  1- Local colors and factor :



  in this type of element, we have two colors that will be distributed randomly on the objects, the factor works the same way as Simple element.

  2- Outline opacity & thickness :



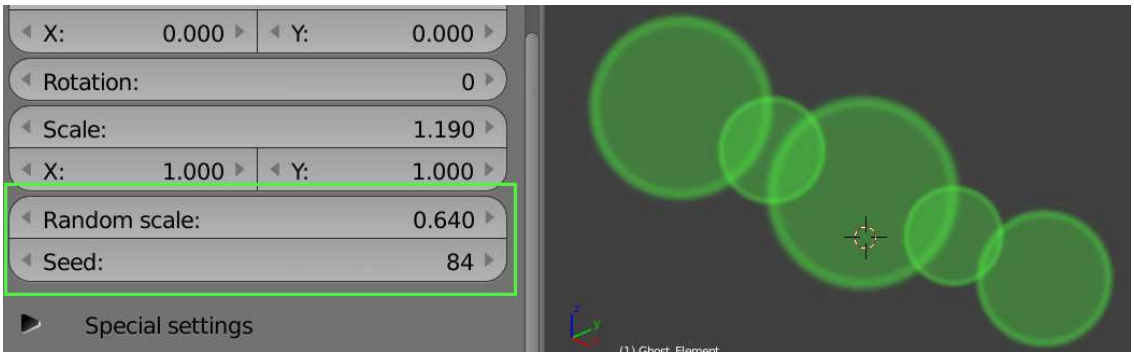
  Draw outline around the element.

3- **ColorRamp :**

control the distribution of the two local colors.

B- Transforms :

1- **Random scale & seed :**



Randomize the scale of the objects.

if you have two or more ghost elements and want them to be identical give them the same random seed and vise versa.

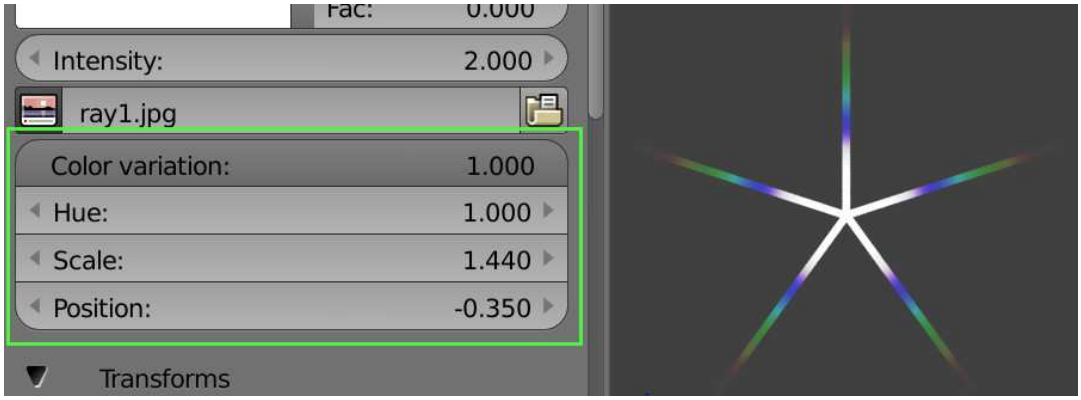
C- Special settings :

1- **Numbre :** The total number of ghosts.

2- **Distance :** The distance between the ghosts.

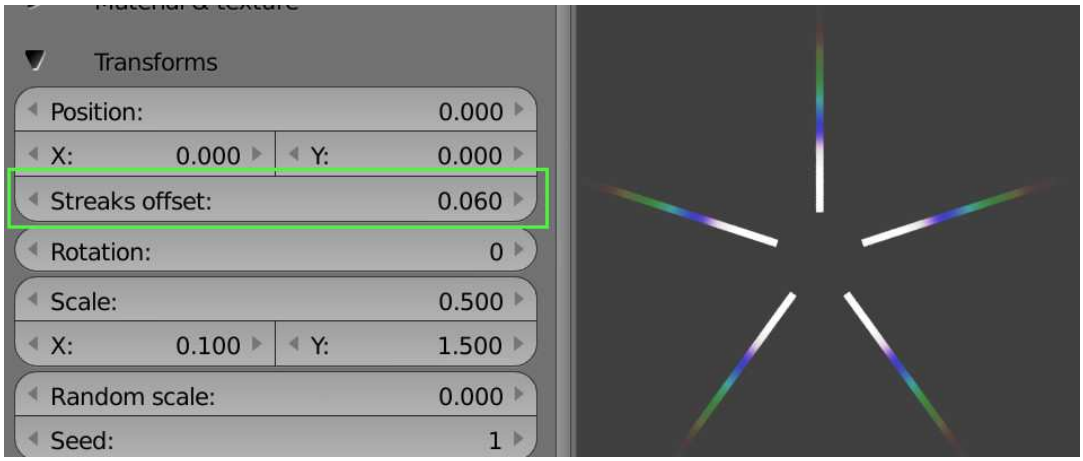
- **Star :** Create stars.

A- Material & Texture :



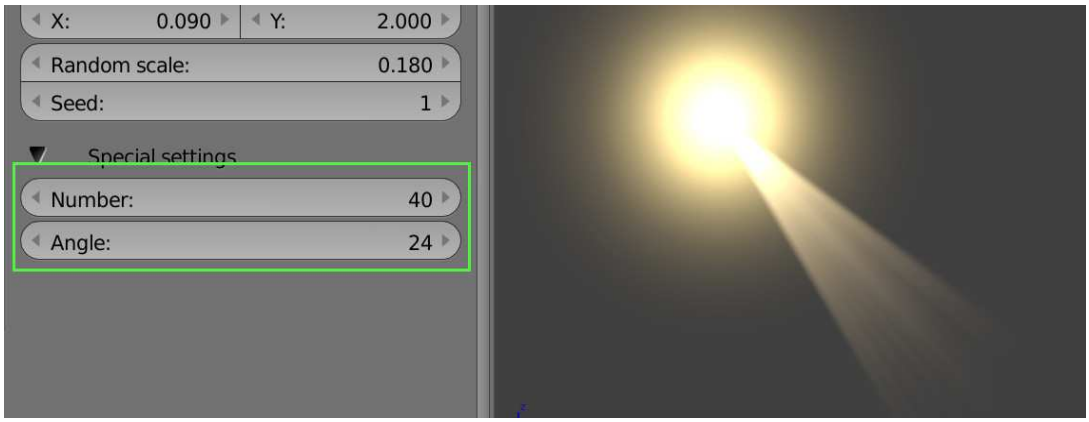
1- **Color variation :** give the element a variantion for the colors.
2- **Hue :** change the colors.
3- **Scale :** scale of the colors along the streaks.
   smaller value = bigger scale.
4- **Position :** position of the colors along the streaks.

B- Transforms :



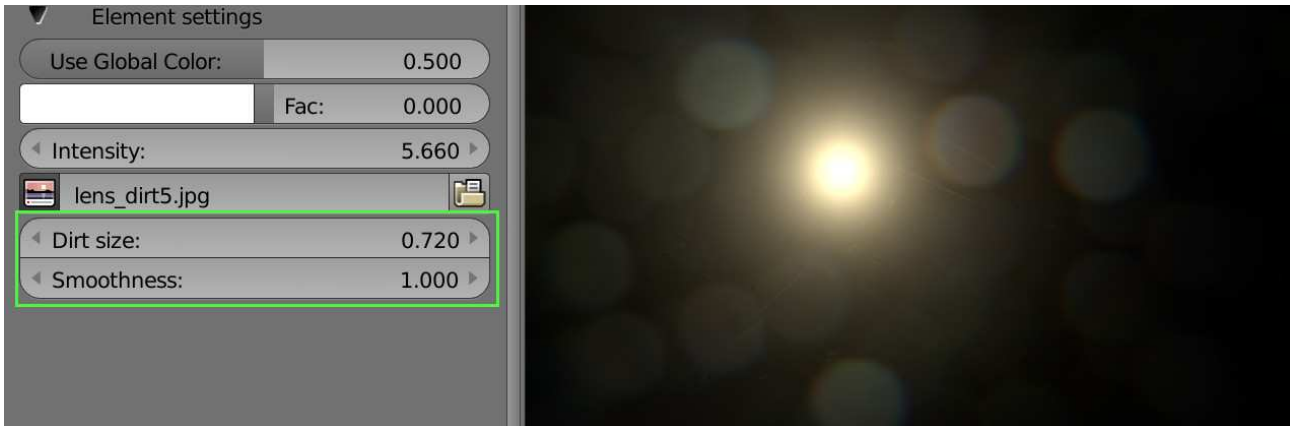
Streaks offset : offset the location of the streaks.

C- Special settings :



1- **Number :** the total number of streaks.
2- **Angle :** interval for the streaks distribution.

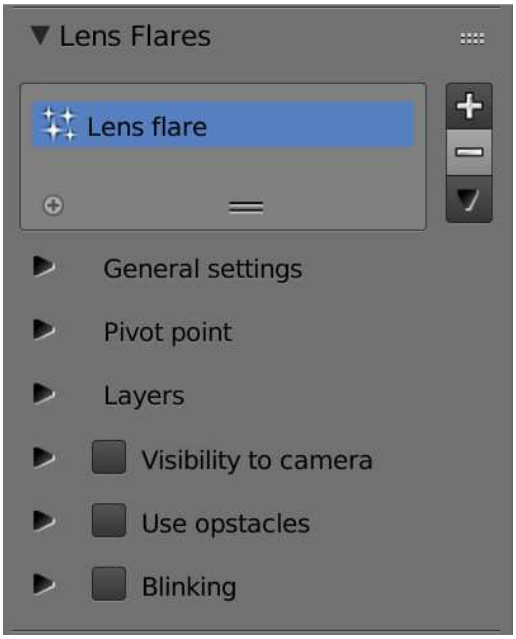
- **Lens dirt :** Simulate (Grit, dirt and scratches) on lenses, it's a subtle effect but adds alot of realisme.



1- **Dirt size :** size of the mask used to specify the affected area, smaller value = bigger mask.
2- **Smoothness :** smoothness of the mask.

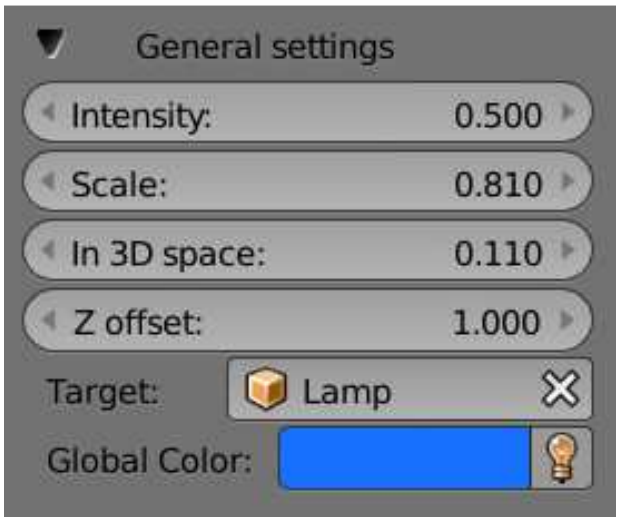
- **Back ground :** simply adds a background.
  Parameters :
  1- **Offset :** move the background away from the camera.
  2- **Frames :** if you use a movie clip or a sequence, you can specify the duration in frames.
  3- **Start frame :** starting frame.
  4- **Offset frames :** offset the number of the frame to use it in the animation.

Lens flare parameters



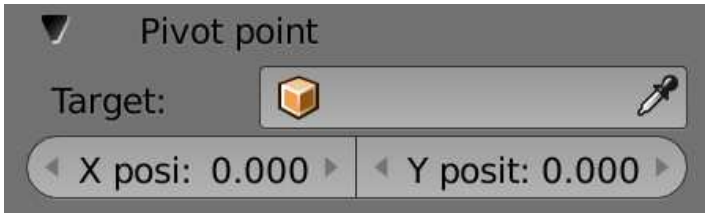
the lens flare parameters affect all the lens flare elements, that's why the elements were explained first.

- **General settings :**



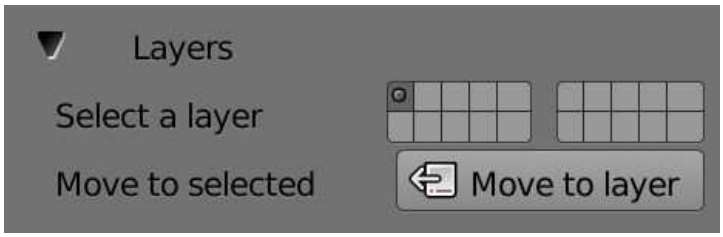
Intensity : brightness of the lens flare.
Scale : the size of the Lens flare.
In 3D space : by default the lens flare will be placed in front of the camera, because the effect(lens flare) happen in the lens of the camera.
If you want to place the lens flare in the 3D space (unlocking the Z axis) change this value to 1.
Z offset : if the source is far away from the camera, sometimes some artifacts appears, you can eliminate them using this parameter.
Target : the object that the lens flare will be attached to (copy its X,Y location).
Global Color : color of the lens flare, if the source object is a Lamp, you can copy the color of the LF to the Lamp using this button  .

- **Pivot point :** the pivot point that all the elements will turn around it, by default its coordinates are (0,0) that mean in the center of the camera.



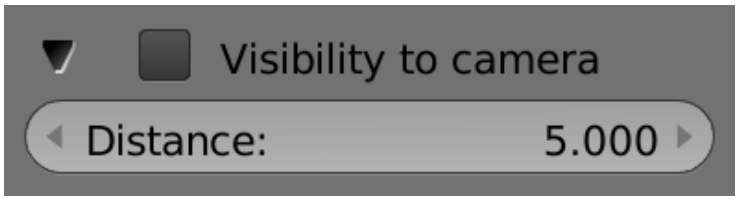
Target : just like the Target in general settings.
X position : move the pivot along the X axis.
Y position : move the pivot along the Y axis.

- **Layers :** you have the option to move any lens flare to any layer, that comes in handy for:
  - creating render layers (for compositing).
  - hide a lense flare.



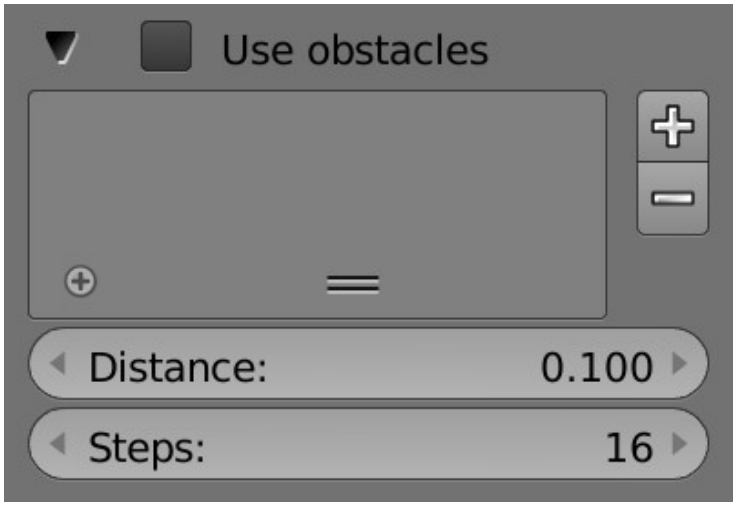
you need just to select a layer then press the button "Move to layer".
The little dot in the layers specify the current layer of the lens flare.

- **Visibility to camera :**



when the source of light is no longer visible by the camera, the lens flare should disappear, with this option you can specify the distance where the lens flare should disappear .
To make the lens flare look more realistic, the lens flare will fade out gradually until reaching the desired distance.
The fade out start in the frame of the camera and ends in the specified distance.
To enable this option just check the box.

- **Use obstacles :**



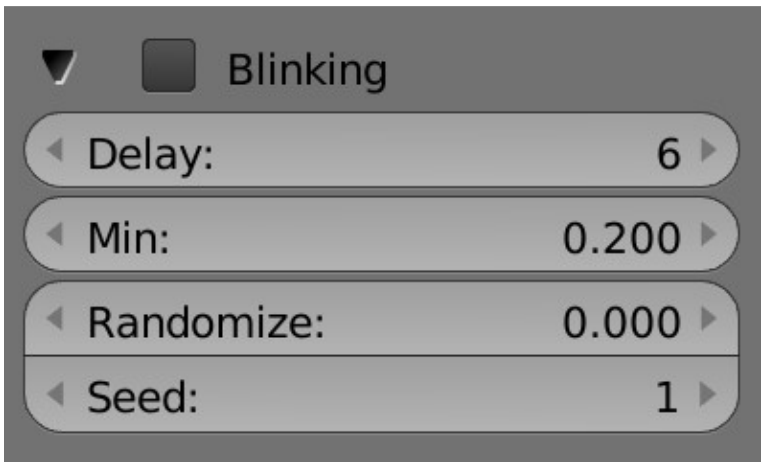
when the Lens flare is obscured (or the Target in this case) by an object it will disappear.
The object that obscure the lens flare we will call it obstacle.
In order to use this option you must enable it first, then select the objects that you want to use them as obstacles in the 3D View, then hit the "+" button, that's it !.
there is some important things to note here:

- only mesh objects are supported, that mean you can't use curves, or fonts(Text object) as an obstacle, due to the limitation of the method used (ray_cast()) in the Blender-Python API, but luckily for us we can convert between types.
- if you change the Target after enabling this option, you must disable then enable this option in order to register the new Target.
- if you delete an object listed with the obstacles, remember to remove it from the list of obstacles, then disable and enable it again, same thing if you rename an object.

How it works: the camera sends a ray from its origin to the origin of the Target, if the ray hits an obstacle the global intensity of the lens flare will be set to 0, but we have more control on how the lens flare will disappear,instead of disappearing suddenly, we could make it fade out nicely , and this is the role of (Distance and Steps).

Distance : if the distance between the Target and and the obstacle is X (X: Distance value), the lens flare start to fade out gradually until the Target origin is obscured.
Steps : say our Distance = 1, and Steps = 4 and the Intensity = 1.
in this case if the distance between the Target and the nearest obstacle is 1, the intensity will take 4 steps before reaching the value 0, that mean:
distance = 0.75 -> intensity = 0.75
distance = 0.5 -> intensity = 0.5
distance = 0.25 -> intensity = 0.25
distance = 0.0 -> intensity = 0.0
so, the more steps you have, a smoother transition you will get, BUT! it may slow down the view port, because it will need more computing power.
the rule here : a big distance needs more steps.

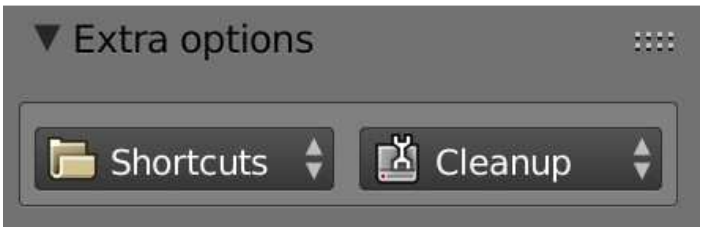
- **Blinking :**



make the Lens flare blink.
Delay : duration between blinks.
if you set Delay = 6 for example, every 6 frames a blink will occur.

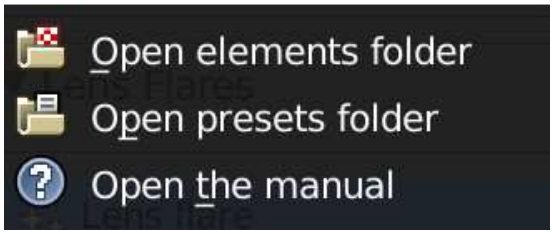
Min : basically the blinking use an interval of (0..1), so the Min value is the zero by default. You can change the Min value to make the blinking effect more subtle.
Randomize : say the interval is (0..1), normally it will increment from 0 to 1 then back to 0 in a loop.
But if you set Randomize to 1, then you will get a random number between 0 and 1.
Seed : to change the blinking pattern.

Extra options



Those features i made them to simplify things while creating the add-on, then it turned out to be useful for the users also, it's simply some operators to open folders and cleanup the blend file.

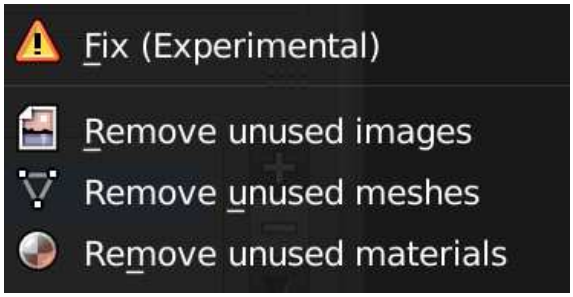
A- Shortcuts



when you install an add-on, it will be located in Windows for example in (C:\Users\UserName\AppData\Roaming\BlenderFoundation\Blender\2.76\scripts\addons\Addon\), this is a long path to go through every time you want to open a folder, Why not providing a one click solution!.

Open elements folder : open the folder containing the image textures, in case you want to add your custom elements.
Open presets folder : open the folder containing the presets, in case you want to (delete, rename, share) a preset, also easily access the "preview" folder.
Open the manual : Not much to say here.

B- Cleanup



there is a concept in Blender known as 0 user, when a data (image, mesh, material...) have no user, Blender will keep it temporarily, just in case you want to use it again.
the down sides:
- you can't get rid of it easily, unless you close Blender.
- it over load the lists.
those operators will cleanup the 0 user data from (images, meshes, materials).

Fix (Experimental) :
first of all, the add on is pretty stable unless you break the rules (the rules will be discussed later).
you may accidentally delete a part of the rig, that will cause the whole system to fail, if you discover it in the right time you can just undo the action (Ctrl + Z).
if it's not possible to undo the action, you can use this functionality, that will automatically detect the missing parts and delete the other parts that depend on them, in order to save the whole system.
a precaution was made to avoid that to happen, by hiding the core parts of the rig, also the elements are not selectable, But bad things happen.
this feature is experimental for the time being, im not sure how useful it is, until i get feedback form a large number of users, depending on the feedbacks it will be clear if this feature must stay and be polished, or must GO.

Warning: Don't do That

1- **Don't delete or rename an object generated by the add-on manually, just use the delete lens flare and delete element buttons.**

2- **The add-on create a bunch of custom properties, drivers, modifiers ... , don't modify, rename or delete them.**

3- **Same thing for the materials created by the add-on.**

4- **Simply don't change any thing generated by the add-on, just use the interface of the add-on.**

Known issues and troubleshooting:

- If you try to hide a Star or Ghosts element it will not work properly until you update the scene, a quick way to update the scene is to change the current frame or just use the left/right arrows of the keyboard.

- If the target is a child of an other object, the obstacles detection feature will not work, to make it work just select the target and bake the animation.

- If you have made your own textures, make sure to put them in the elements folder, because if you save your own preset, the add-on will look for the textures in the elements folder, also make sure to save the preset in the presets folder.

- If you want to share a preset that contain your textures, you have to share those textures as well.