Blender Visualization Tutorial SS2013 II Part 2/2

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CELLmicrocosmos Cell Modeling Project SS2013, Bielefeld University,
Version 14.05.2013

Forum:
http://www.cellvisualization.org

Direct link to this forum entry:
http://www.cellmicrocosmos.org/Cmforum/viewtopic.php?f=50&t=721

Actual Version of Blender:
http://www.blender.org

Here, Blender 2.66a is used.

Target

Build a *manta ray* [Manta birostris] and its environment.

This is only a protocol of actions which has to be done to build the manta ray. For an explanation en detail, please get the articles from ct'2012 Heft 21 and 22.

http://www.heise.de/video/artikel/Blender-Fertige-3D-Animation-eines-Rochen-1724381.html

http://www.heise.de/ct/inhalt/2012/21/164/

http://www.heise.de/ct/inhalt/2012/22/172/

To use this protocol, please finish first the “Blender Visualization Tutorial SS2013 I“. Most methods used here were already discussed there.

Abbreviation

RMB Right Mouse Button

LMB Left Mouse Button

! For using most of the shortcuts discussed in this tutorial, you have to be sure that the mouse cursor is WITHIN the view port of the 3D View !

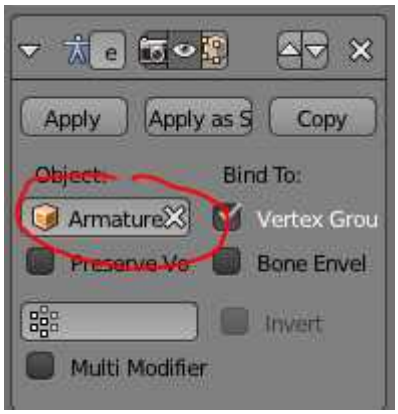
Flesh to the Bone

The skeleton is finished, but now it has to be somehow connected to the mesh of the Manta Ray

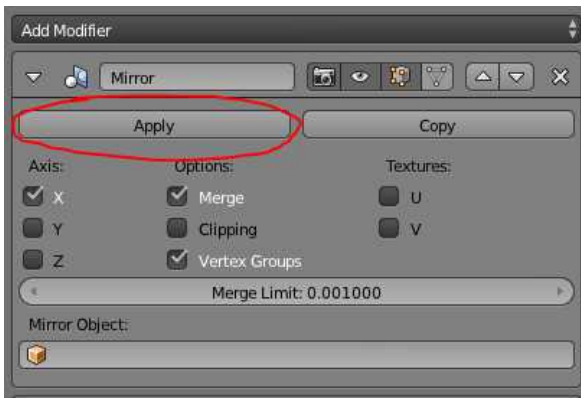
go back to “Object Mode” and select the mesh of the Manta Ray

go to modifiers and select the “Armature” modifier:

in the newly added modifier, set as “Object” the Armature/the skeleton you just created:



but before we continue, we first has to apply the modifier “Mirror” to the mesh:

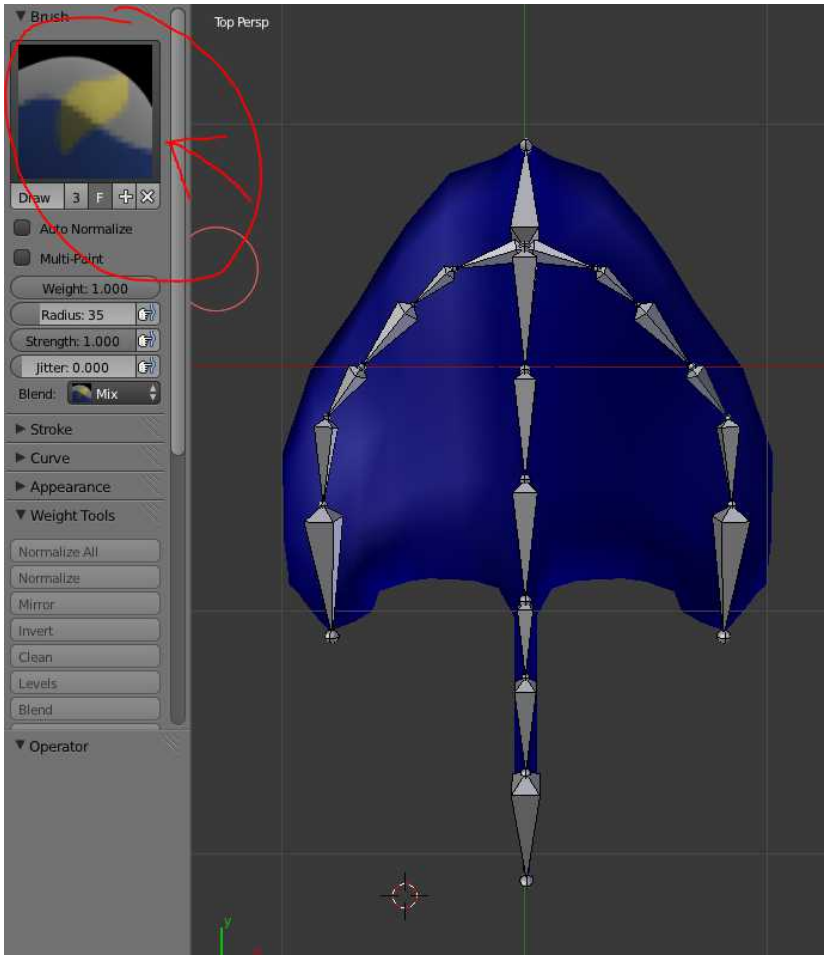


(Afterwards, it will not be possible to work in mirror mode anymore, but 1) we will not need it and 2) for the following methods it would be a problem, because during weight painting the bones in the wings have to be assigned to only a single side)

change from “Object Mode” to “Weight Paint Mode” while exclusively Manta's mesh is selected

select the armature/skeleton and change now from “Object Mode” to “Pose Mode”

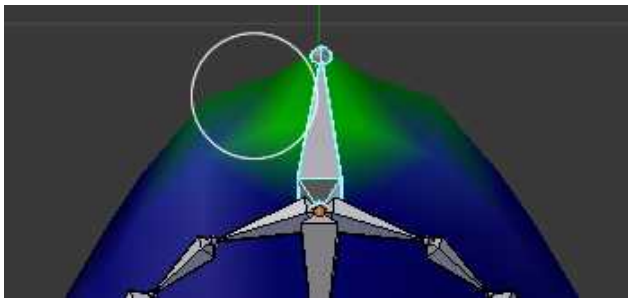
reselect now the mesh of the Manta Ray, the window will look like this:



on the left top there is the actual Brush, click onto it (see arrow) and change to “F Add” mode and change the strength to 0.5:

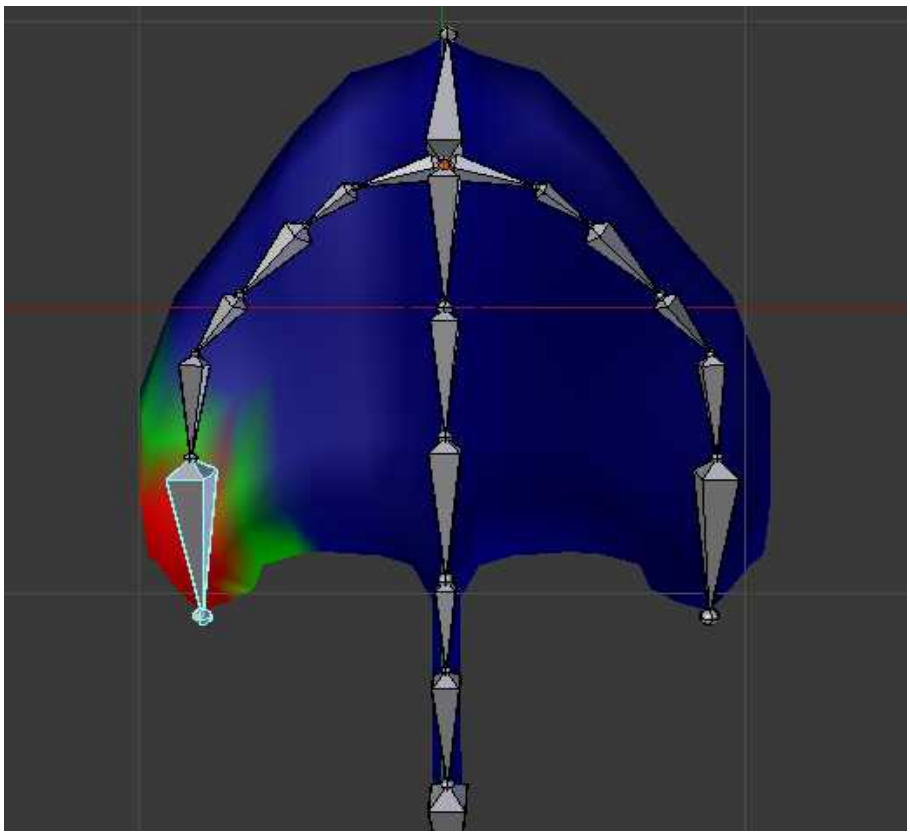
Note that if you draw something wrong during the next steps, you can use the “F Substract” Brush to correct it

Now *RMB* on the head bone and then use *LMB* to draw onto the top of the mesh below this bone; now, the area affected by the bone is defined, green means, that the bone slightly affects this area, red means that the bone strongly affects this area



to check the effect of the bones on the flesh, just transform the bones, e.g. by using *R* and rotate it a little bit, just finish with *RMB* to undo the rotation

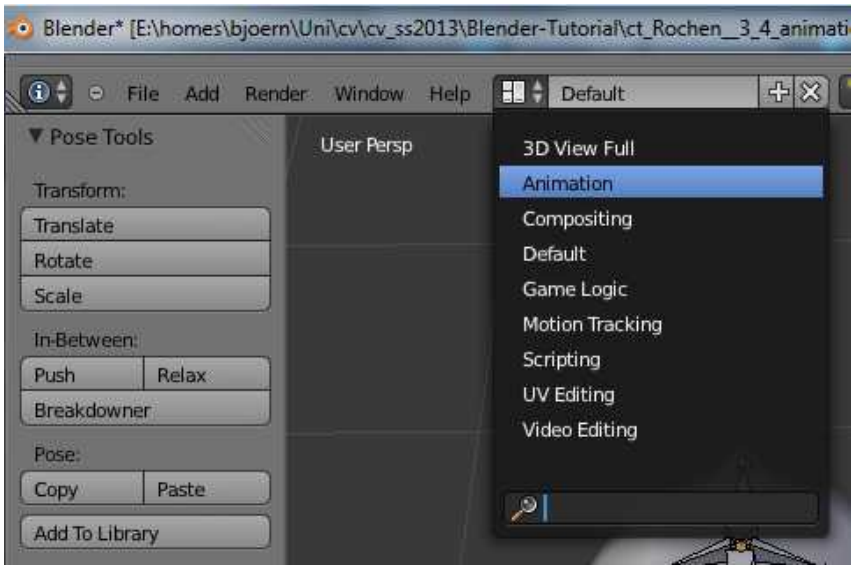
do this now for all bones and be aware that you should not paint only the area directly nearby the bone, the whole area to be affected has to be painted



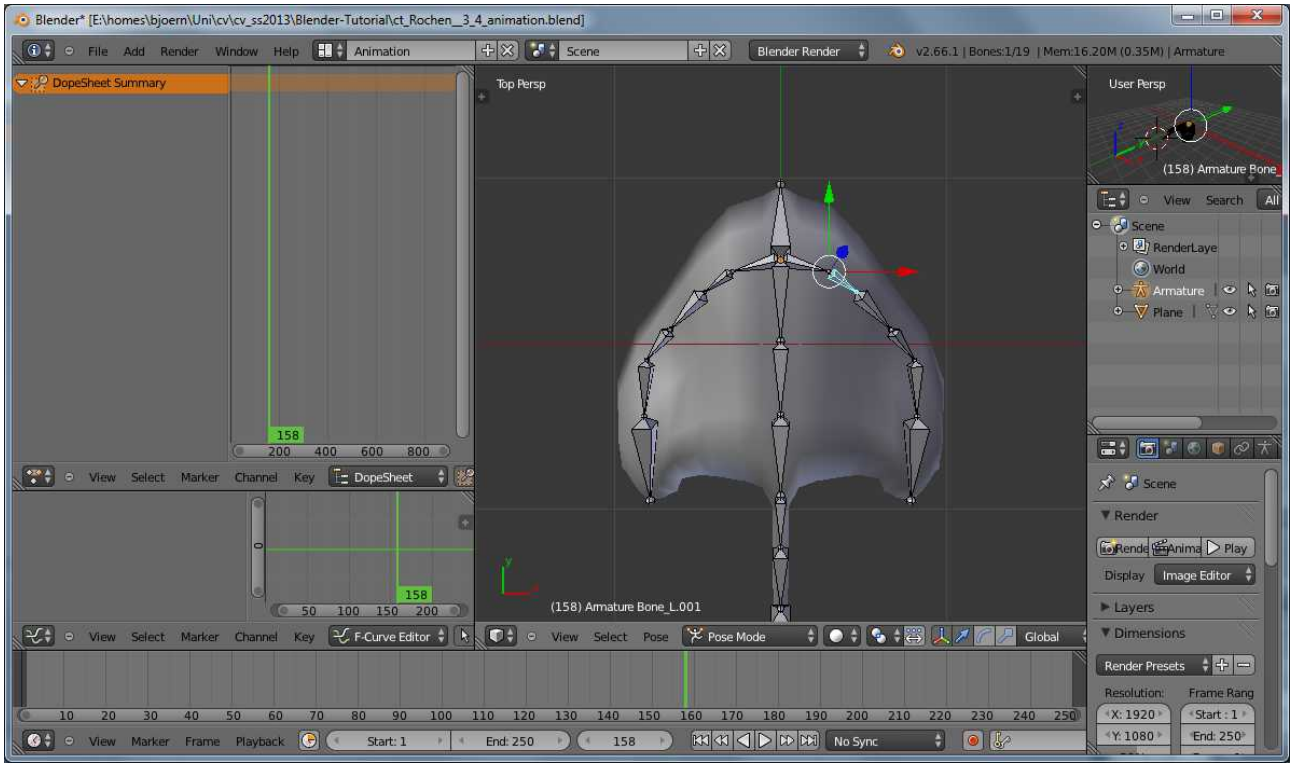
→ ct_Rochen__3_3_bones_n_flesh.blend

Animation

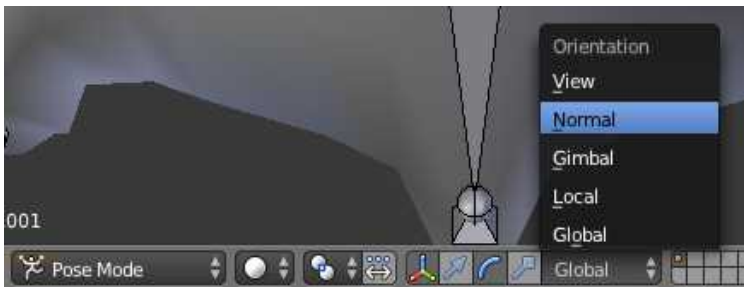
Now go back to “Object Mode”, select the bones and change the Screen layout from “Default” to “Animation”:



the window layout should look like this

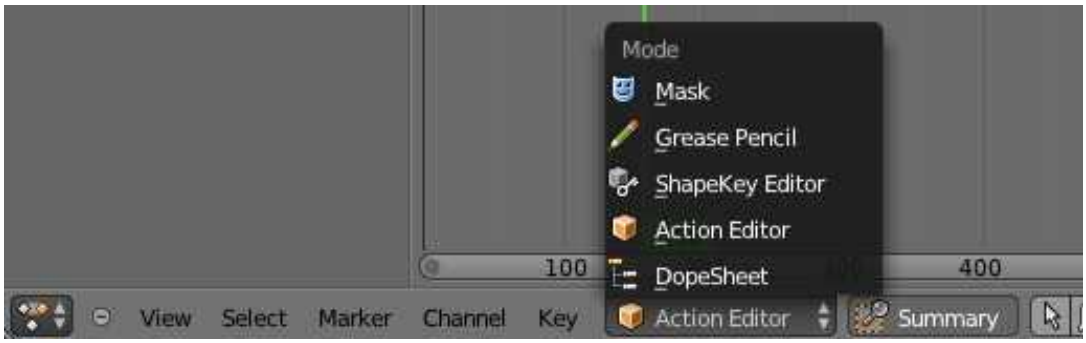


now the wings will be moved! First, it might be useful to switch the “Transform orientation” to “Normal”, to enable the rotation in relation to the orientation of the actually selected bone:



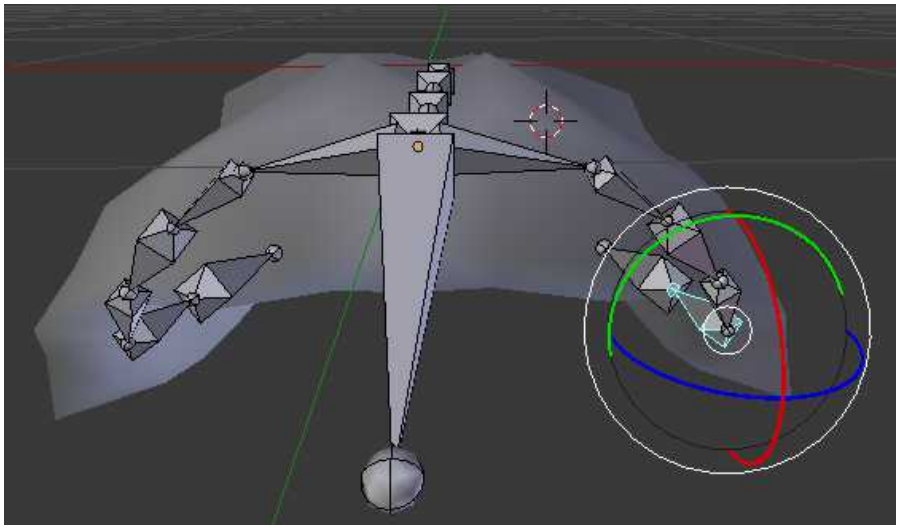
but this depends on the bone composition of your wings

Switch the “Editing Context” of the “Dope Sheet” to “Action Editor”:



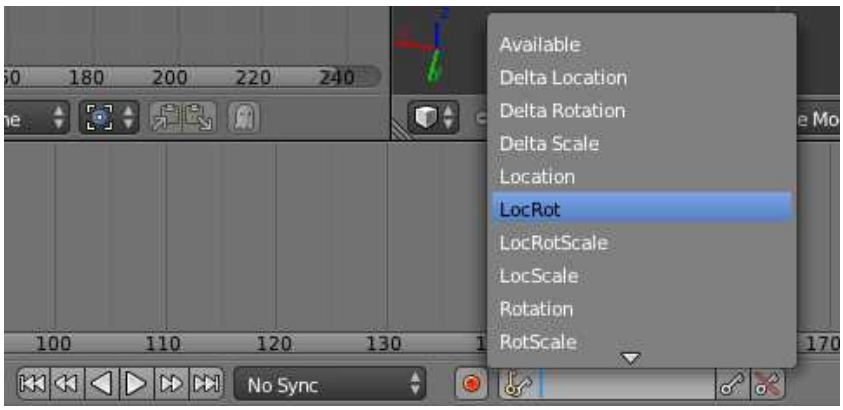
create a new action and call it swimming by first clicking at the “+” and then changing the name to “Swimming”

and now the Manta Ray has to swim, use the rotation manipulator to change the composition of the wings

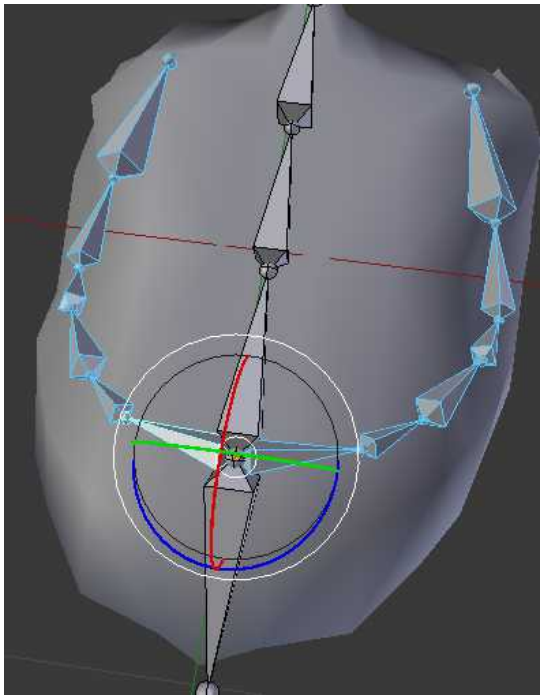


here, the CTRL key was pressed during rotation to change the rotation in 5° steps; each joint of the wings is rotated by 10°

now this composition has to be saved as a keyframe, first the data to be saved has to be defined: “LocRot”, to save the location and the rotation:

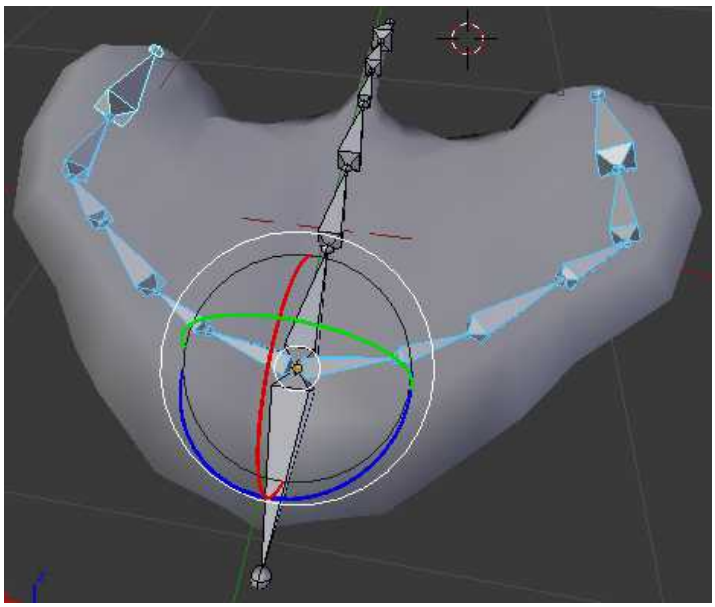


first, select all bones which are connected to the actual movement, here, only the wing-related bones:

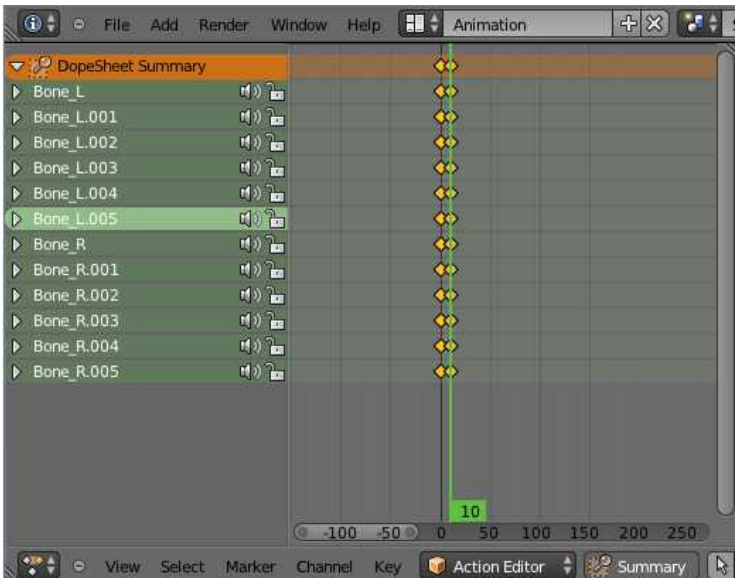


make sure that you are at time point 0 in the time line and then press

now move the actual time point to 10 (you may move the cursor in the DopeSheet by mouse or by using + or -) and then change the wing bones into the opposite direction:



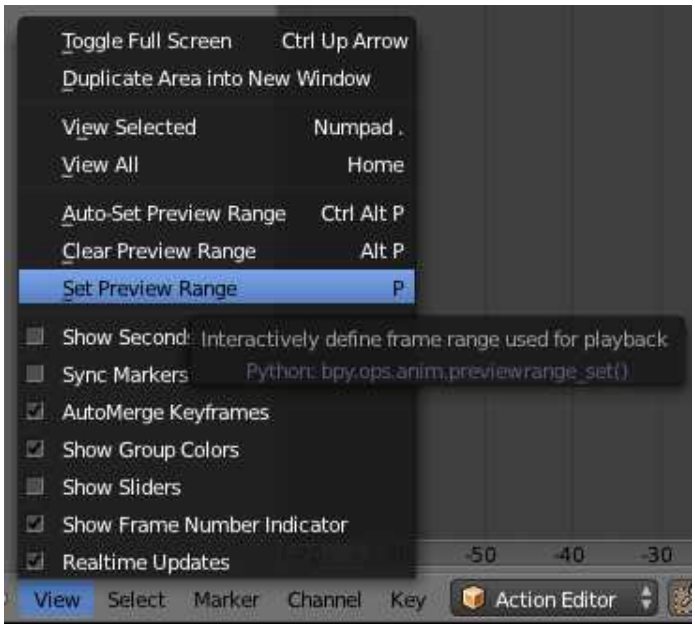
again select all wing bones and add the new keyframe, the result should look like this:



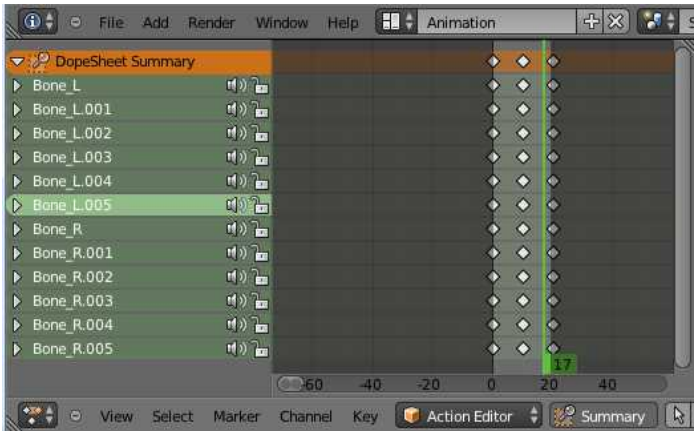
select now all points of the first keyframe (just use again *A* to deselect all and *SHIFT+RMB* to select multiple nodes) and then copy them by *CTRL+C* or:

go now to keyframe 20 and then paste (by the menu above or *CTRL+V*)

use now *P* or



and then set the range to 19:



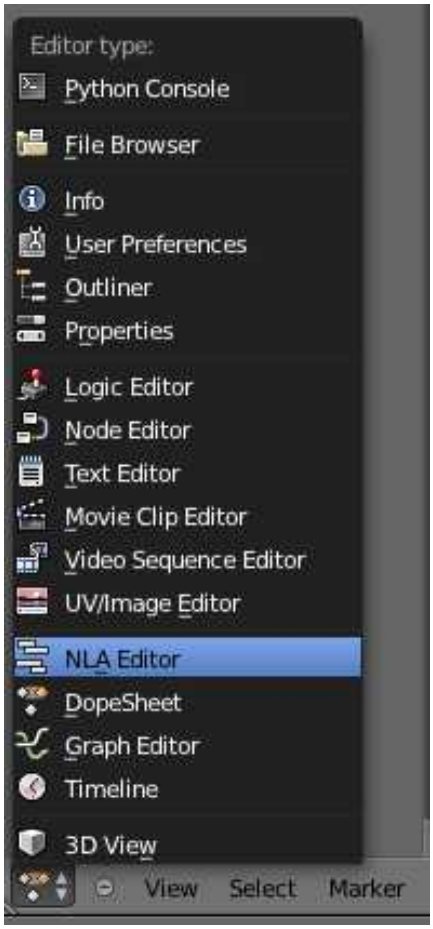
if you press now the play button, the animation is repeated

this part of the animation is finished, now, the tail has to be animated

first, press +

name it “Tail” and then animate the tail in a similar way as the wings

now, change from “Dope Sheet” to the “NLA Editor”



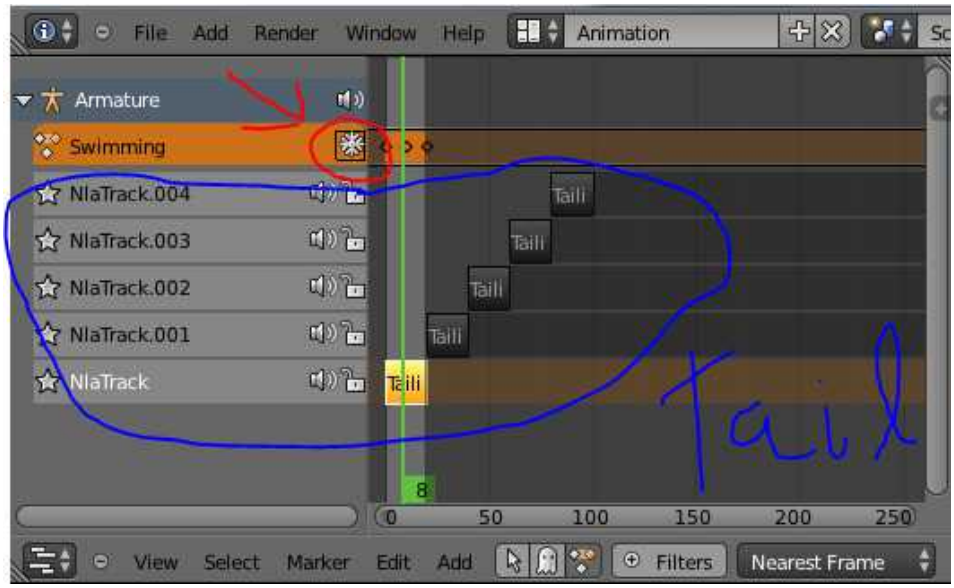
coming from the “Tail” animation, here this animation should be shown

by pressing at the snow flake, a block is created which has to be cloned by pressing *SHIFT+D*

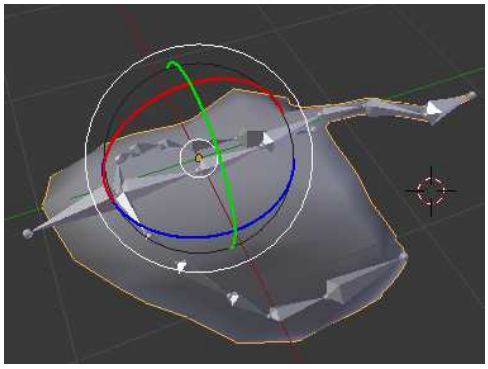
move the new blocks to the end of the previous block

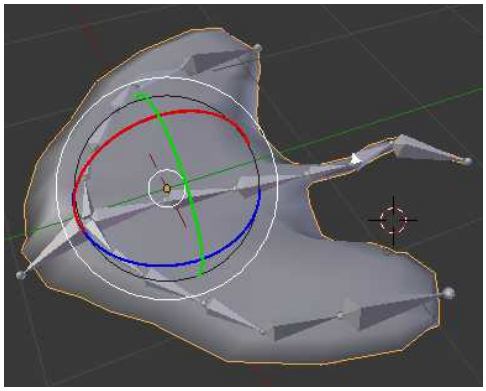
do this 4 times, until 100 time points are filled

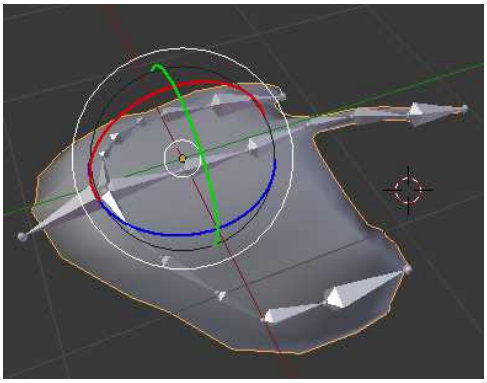
go back to the “Dope Sheet”, select “Swimming” and switch back to “NLA Editor” and do the same as done for the tail



the basic animation is finished:







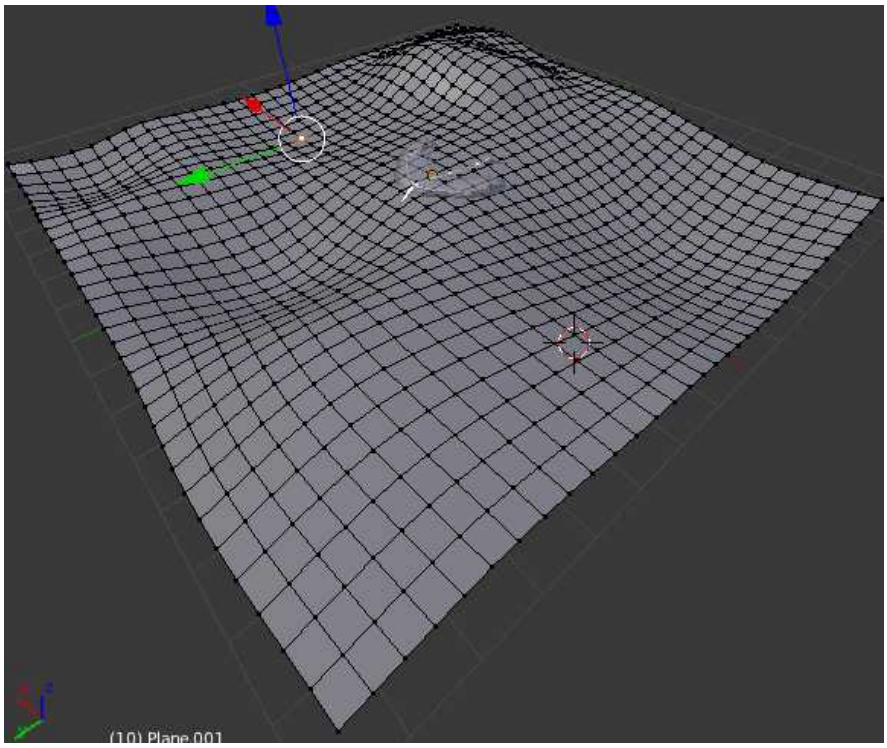
→ ct_Rochen__3_4_animation.blend

Create the Environment

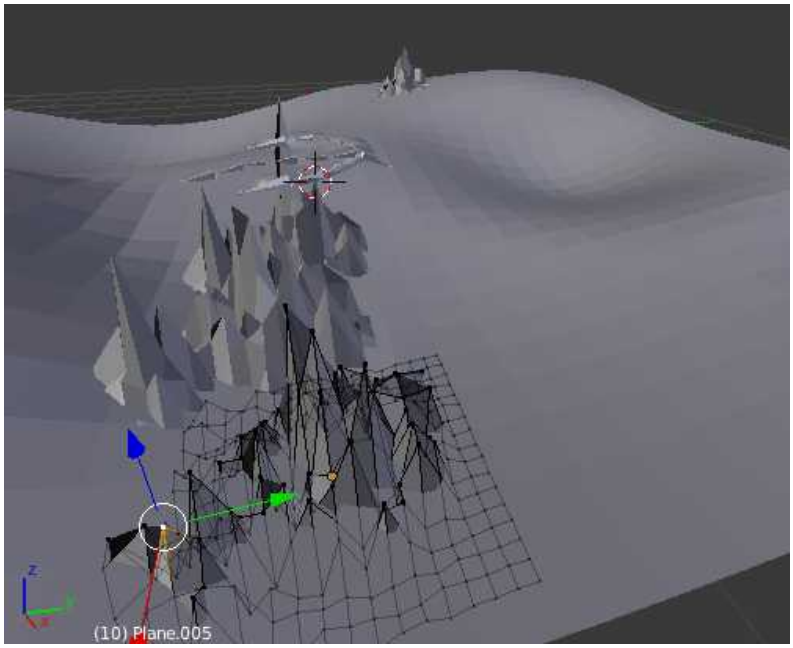
Create a plane by Add → Mesh → Plane

move it to the center, set the dimensions to 15x15, change to “Edit Mode” and Subdivide it – by *W* and option “Subdivide” - several times, until ca. 30 segments at each length were created

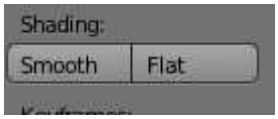
use now the “Proportional Editing” to create some small hills on a underwater ground



create now small planes, use the  (Random) mode to create sharp stone-like structures

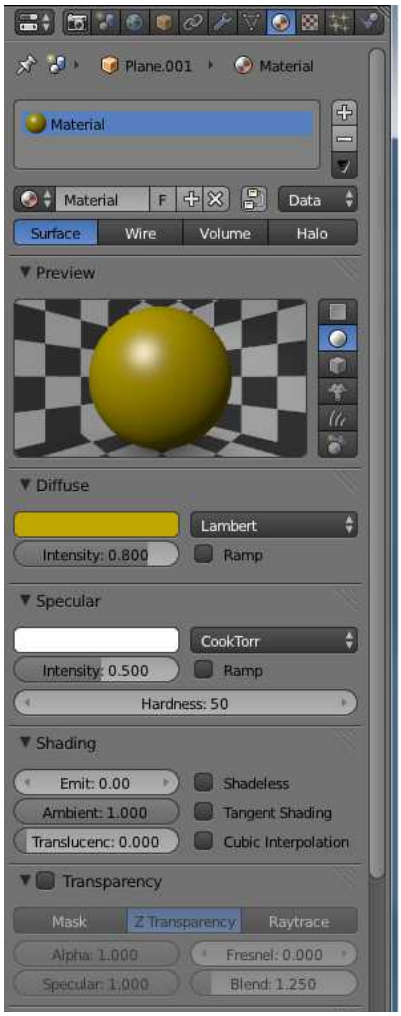


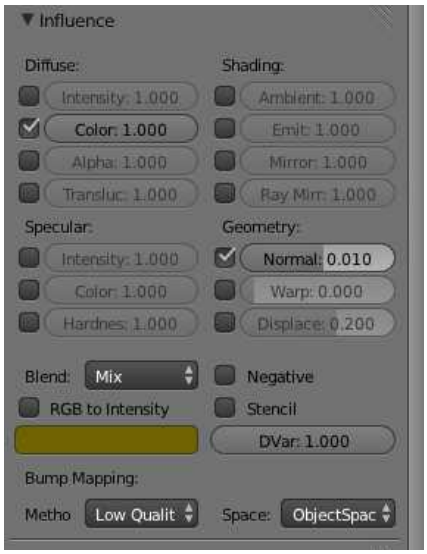
finally, it might be a good idea to smooth all newly created objects:



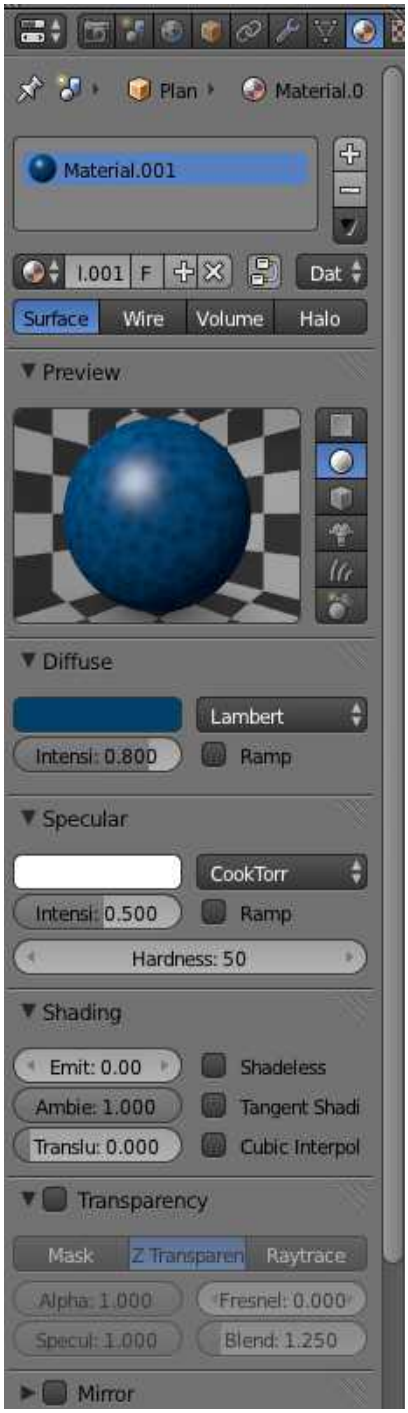
now let us add some colors

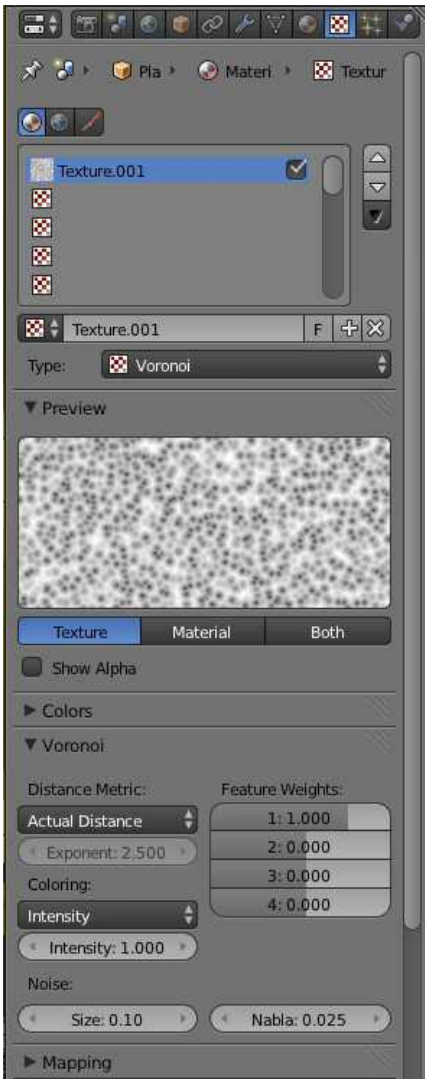
Material and Texture for the ground

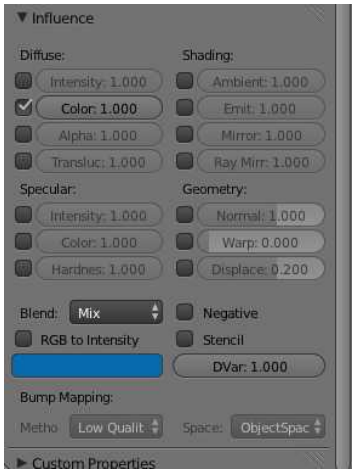




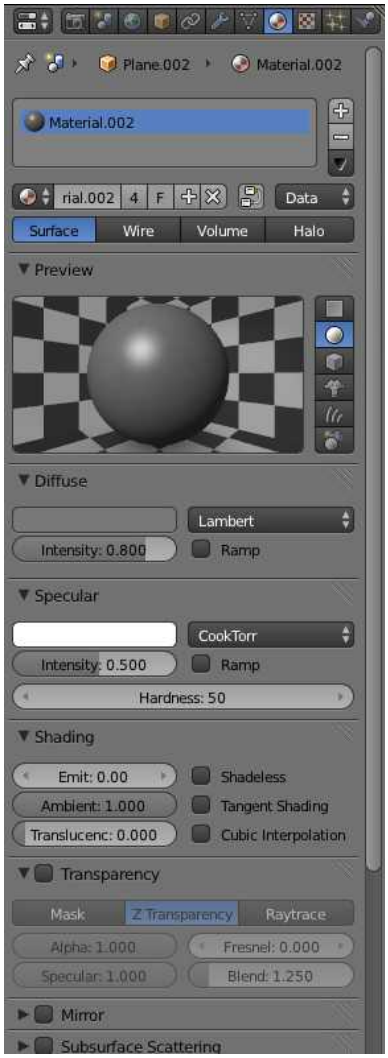
Material and Texture for the Manta Ray:

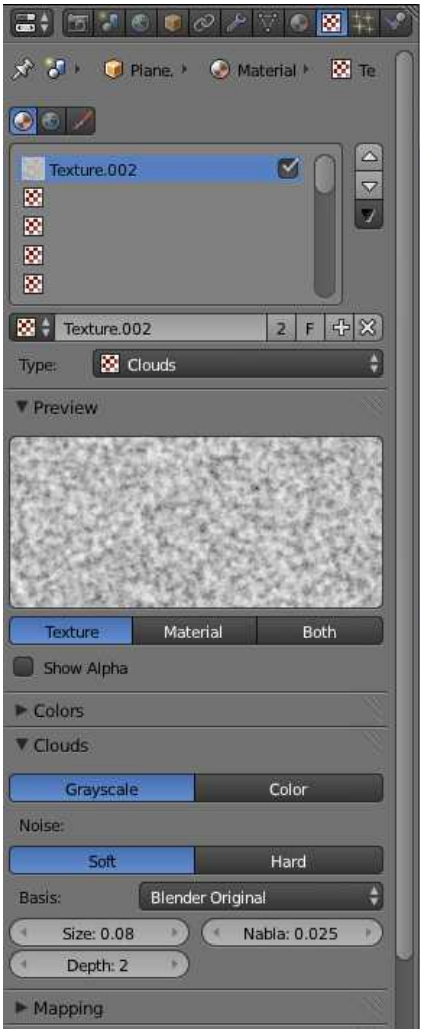


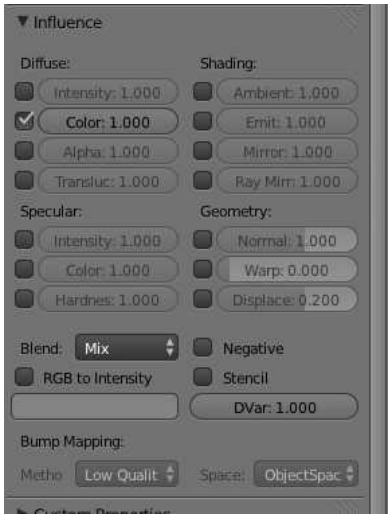




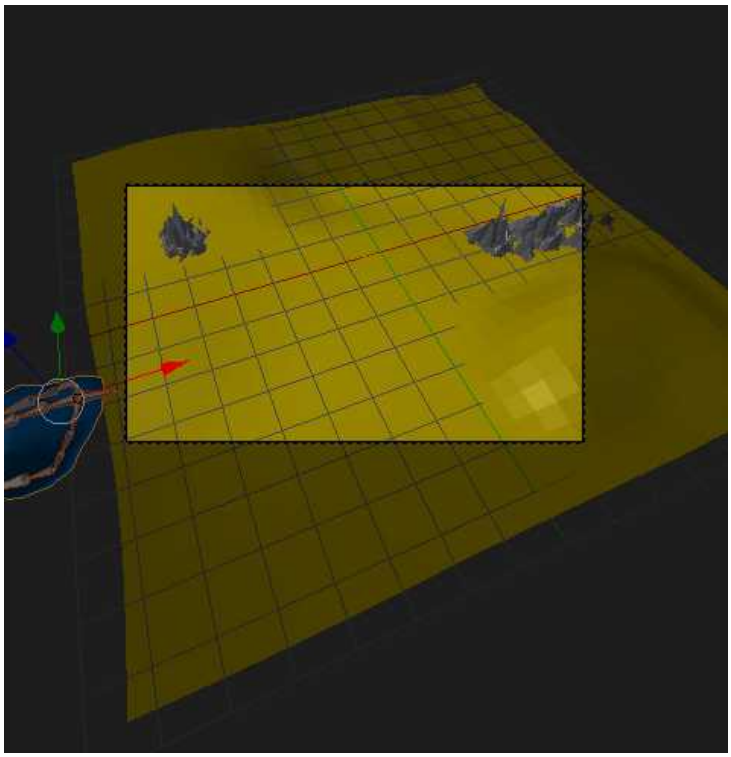
Material and Texture for the stones





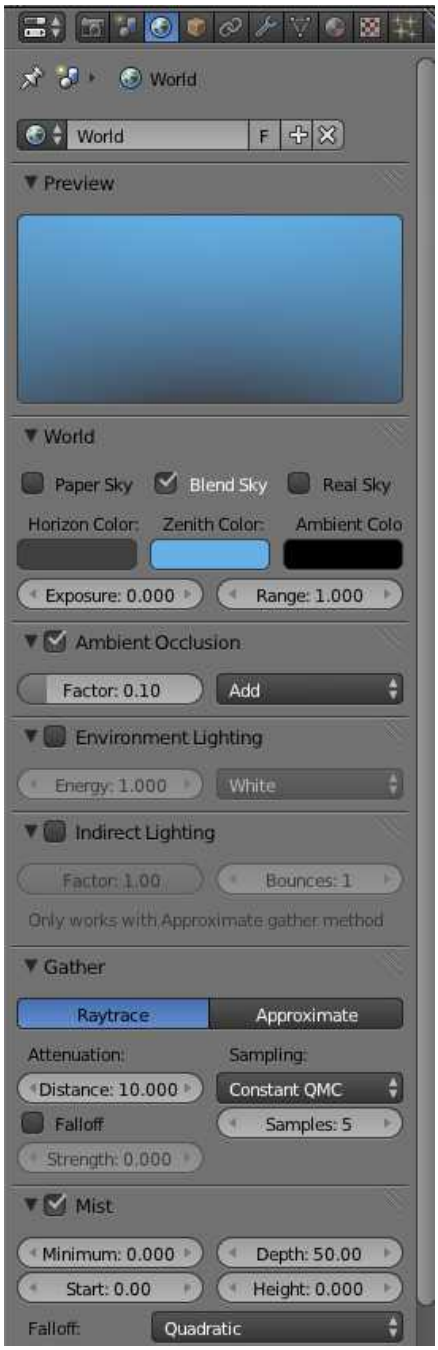


now create a camera, if it does not already exist



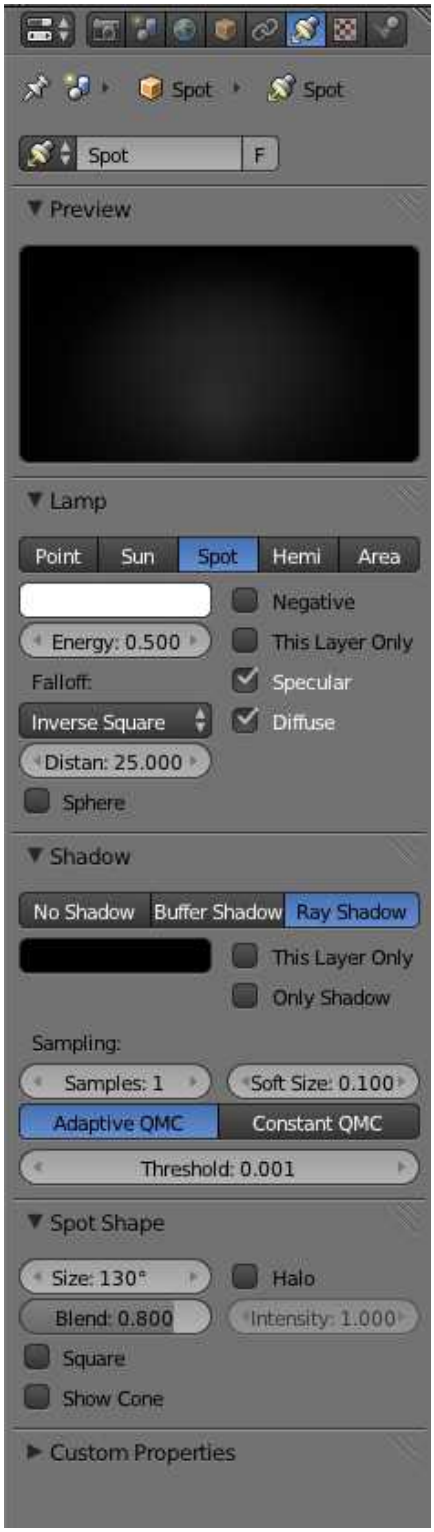
move the Skeleton and the Manta Ray mesh together (select both by *SHIFT+RMB*) e.g. to the left border of the camera

now create the world settings to simulate an underwater scene



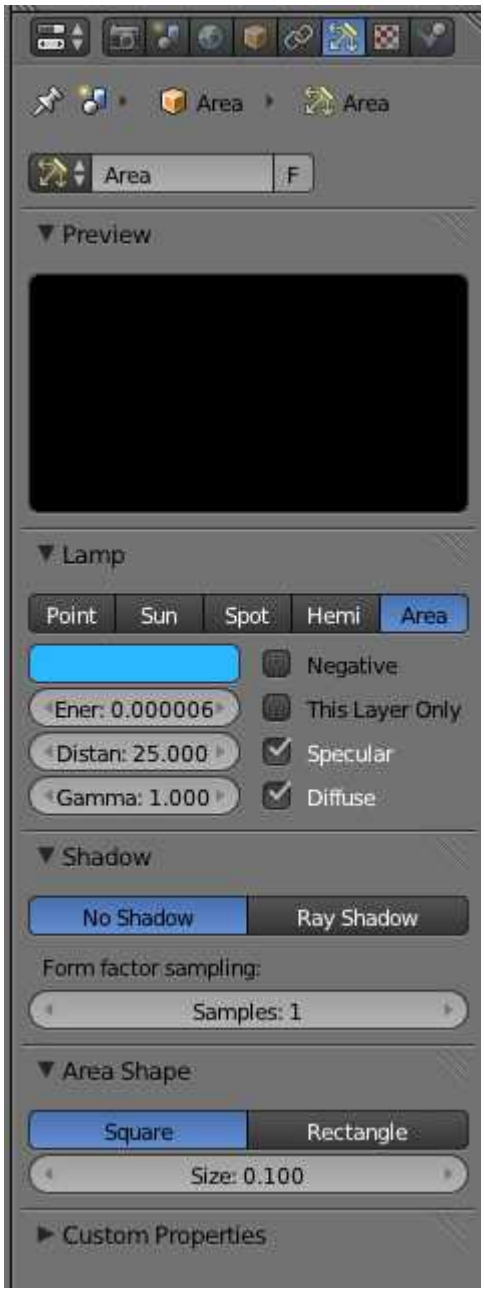
create a new light, if it does not already exist: Add → Lamp → Spot

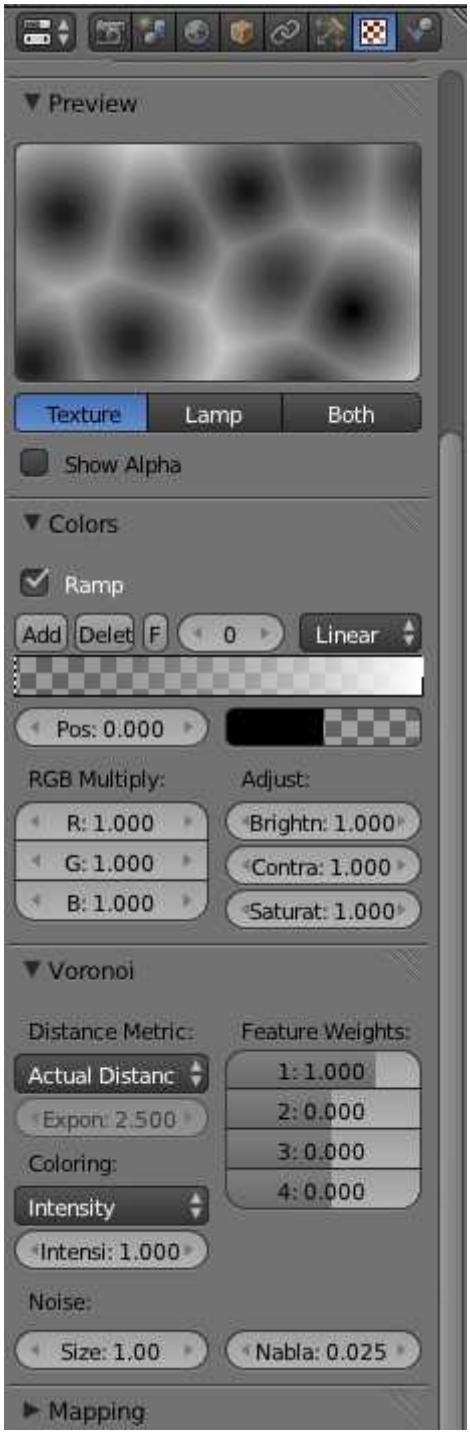
use these settings:



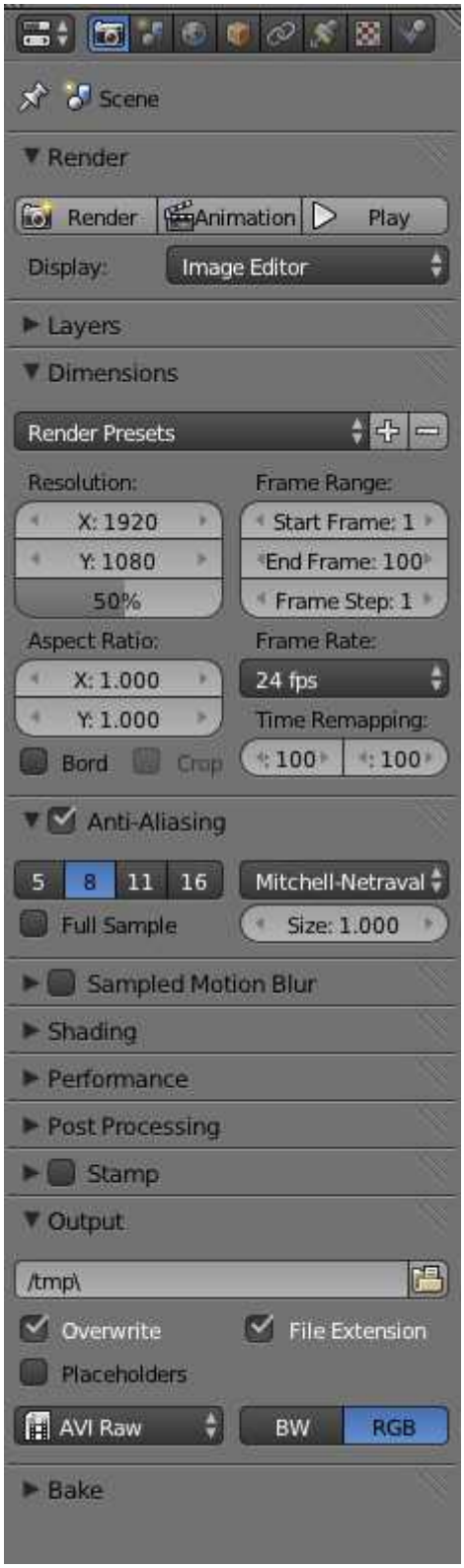
Add a new area light by Add → Lamp → Area and position it at (0,0,11)

and after setting these properties, add this material to fake a water effect on the ground

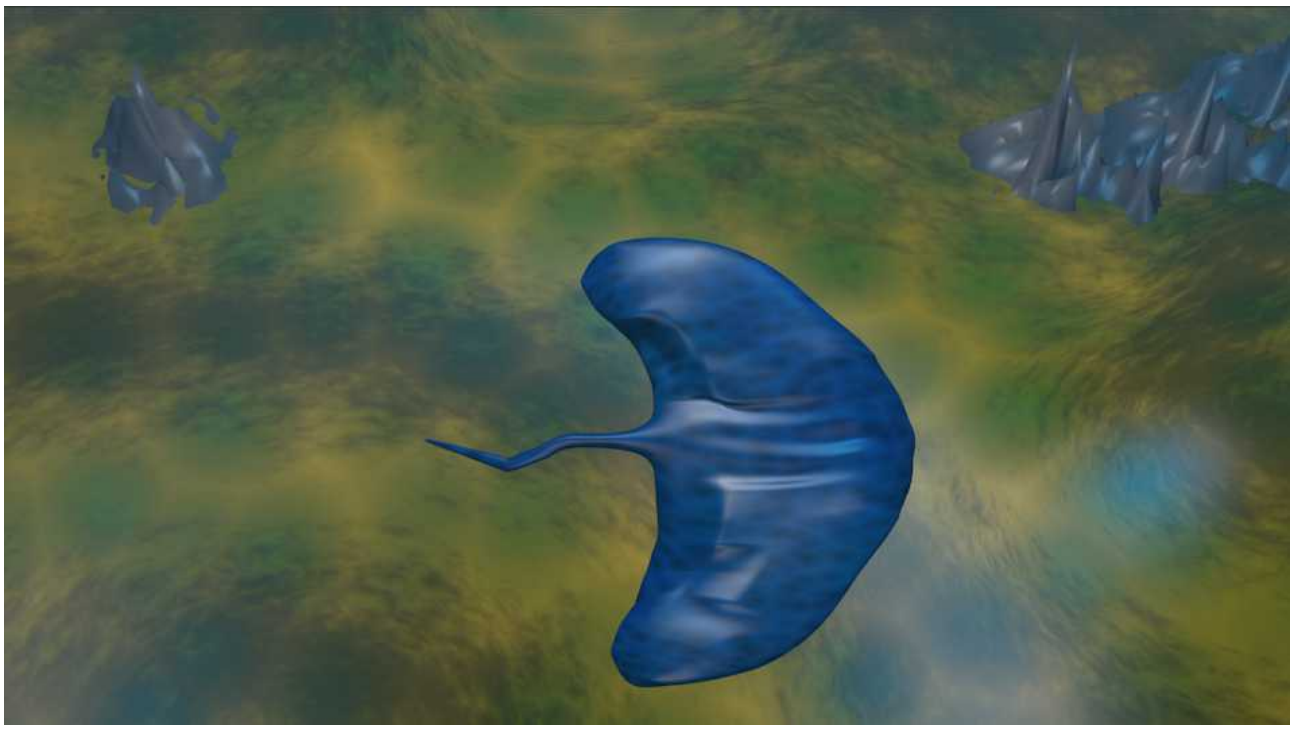




Finally, we should start the rendering, e.g. like this, do not forget to click to limit the “End Frame” to 100, and finally click onto “Animation”



the result might look like this:



→ ct_Rochen__3_5_environment.blend