
The Jellyfish

This tutorial goes through the steps to model, texture, animate and add Paint Effects tentacles.

The following topics are discussed:

- Creating surfaces
- Transforming objects and components
- Basic texturing
- Nonlinear deformers and keyframe animation
- The Graph Editor for modifying animation curves
- Adding tentacles with Paint Effects to a jellyfish.



Jellyfish

Note: This final image was created by compositing the single jellyfish a number of times to populate the scene.

Note: **Before you start:** This tutorial requires Maya scene files. If you haven't installed the tutorial files go to the "Try Maya" section of the "Taste of Maya" CDROM to install.

Starting Maya: You can start Maya by double-clicking the **Maya 2.5 Evaluation** icon on the desktop or from **Start → Programs → Maya 2.5 Evaluation → Maya**.

In Maya: Once the tutorial files have been installed you will need to set the current project in order to access the Maya scene files. To set the current project from within Maya select **File → Project → Set...** and navigate to the directory where you installed the Maya scene files. Select the directory: *Maya_tutorial_data* and press **OK**.

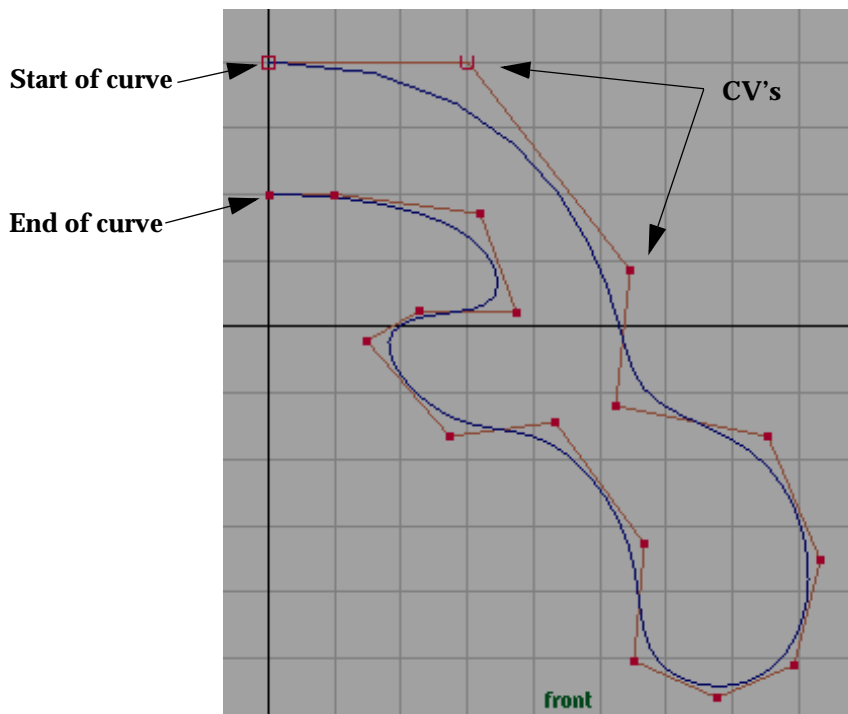
MODEL THE JELLYFISH

1 Start a new scene with **File → New Scene**

2 In the front window, use **Create → CV curve tool** to draw a NURBS curve as shown

- Press **F3** to access the Model menu sets.
- To draw a curve start clicking with the left mouse button to place CV's.

A CV is a control vertice and is used to control the shape of the curve. You will need to place a minimum of four CV's before you will see the curve. You can use the **x** key to snap the CV's to the grid. You can also use the **y** key to undo any mistakes.



Curve to be revolved into jellyfish body

Note: The first two CV's and the last two CV's of the curve should lie directly on the Y axis. If they do not, the jellyfish will have a hole in the top and bottom when you revolve in the following step. If you snap the first and last two CV's to the grid like in the picture the CV's will lie directly on the Y axis.

3 Select the curve and create a surface using the revolve tool

- Press **q** to change into select mode or click on the **Select Tool** icon
- Select **Surfaces** → **Revolve**

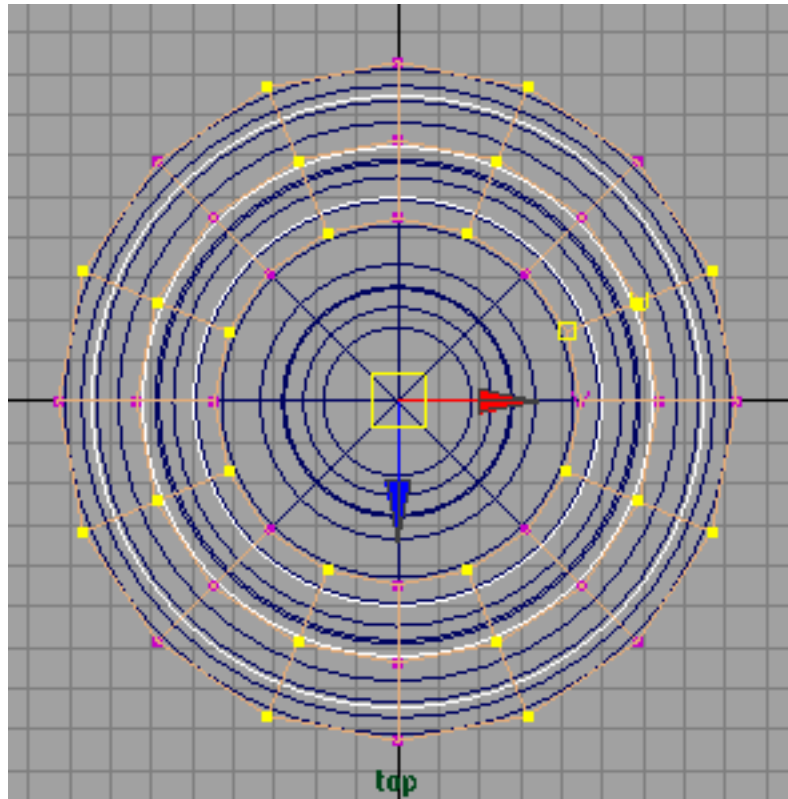
4 Create → NURBS Primitives → Torus

5 Move and Scale the torus to fit inside the Jellyfish body

- The hotkeys for Move and Scale are **w** and **e** respectively.
If you press **w** you will see a manipulator at the centre of the torus that has arrows pointing along the x, y and z axis. Use these manipulators to move the torus. If you press the **e** key the manipulator changes from arrows to boxes. These boxes control the scale of the torus. If you click on an arrow or box then the move or scale will be constrained to that axis. Notice that if you click directly on an arrow or box that it turns yellow. If you click on the box at the center of the manipulator then you can move or scale the object in all axis at once.
- In the Channel Box, increase the sections to 16
In the Channel Box click on the name *makeNurbTorus1* under **INPUTS**. You will see more attributes that are available. Click on the number beside **Sections** and enter 16.
- You may also lower the Height Ratio to get a better fit
Click on the number beside Height Ratio and change the value to adjust the thickness of the torus

6 In the top view press F8 to change to component mode and select the CVs as shown

- F8** toggles between object and component mode. If you watch the Status Line when you press **F8** you will see it change from object to component mode. Component mode is similar to an edit mode which allows you to tweak the shape of your object at a CV (or other component) level.
- Hold the shift key down and select the same CV's as in the image below by clicking and holding the LMB and dragging it over the CV's.
If you accidentally select some of the wrong CV's keep holding the shift key down and click drag over them again. This will deselect them.



Select these CVs to create the inner part of the jellyfish

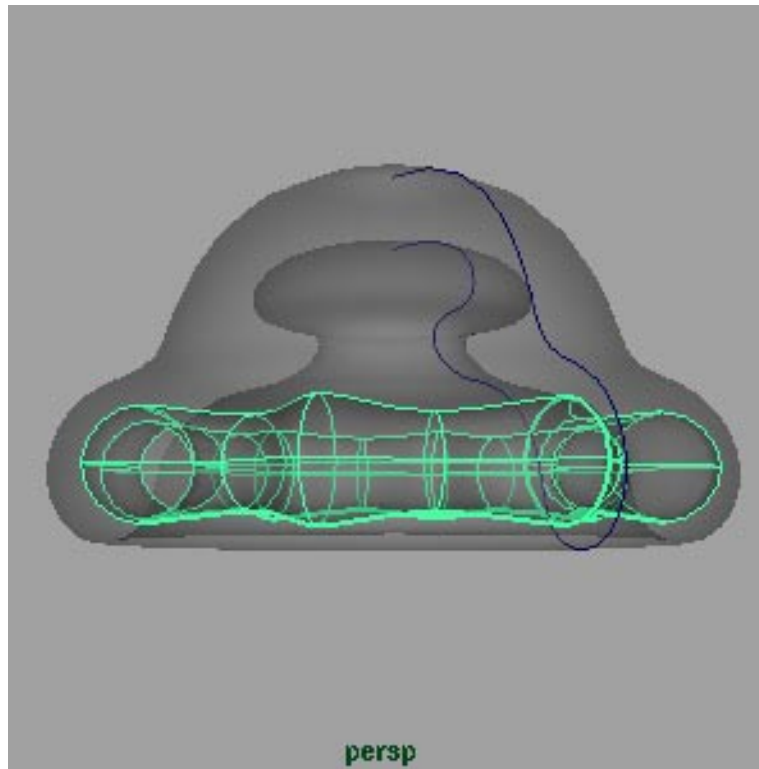
7 Scale the CVs to give the torus a series of ridges

- Press **e** and scale the selected CV's down

Note: You may need to increase the Scale of the torus to fit the jellyfish body.

8 The jellyfish model should look as shown below

- Click in the perspective view to make it the active view
- Press 5 to go into shaded mode
- Select both surfaces
- Press the 3 key to increase the display smoothness of the surfaces
- select **Shading** → **Shade Options** → **X-Ray** from the perspective panel in order to see through the surfaces in shaded mode



Completed jellyfish body

Note: To see the jellyfish in shaded mode press **5**. To increase the smoothing, with the model selected, press **3**. To see the model in X-Ray mode use **Shading** → **Shade Options** → **X-Ray**.

9 Press F8 to return to object mode and select the body and the torus and Edit → Group

10 Rename group1 to jellyfish in the Channel Box

- In the Channel Box click on the name *group1* and type in *jellyfish*

Tip: The curve you revolved may be deleted by selecting it and pressing the **Delete** key.

TEXTURE THE JELLYFISH

1 Open the file jelly1.ma or continue from the last step

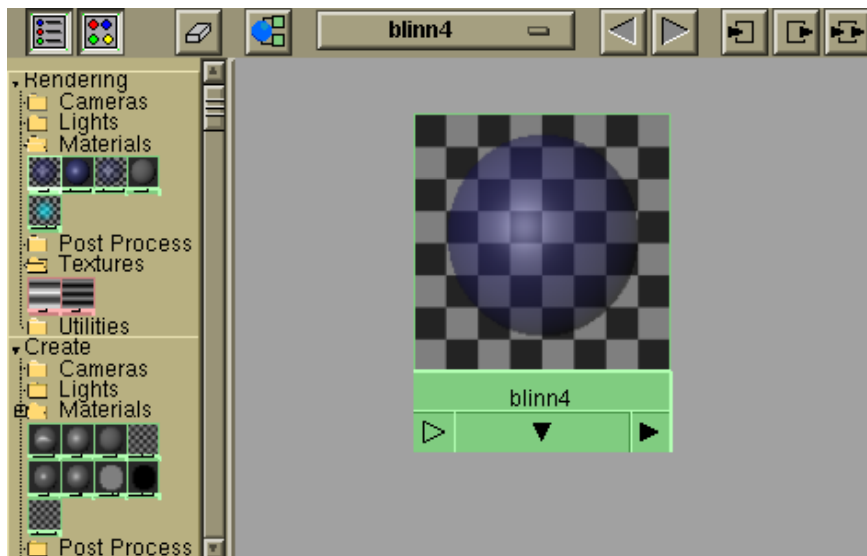
2 To create a material open Window → Hypershade

3 Create a material for the jellyfish

- MMB drag/drop a Blinn material from the Visor on the left to the Workspace on the right

Note: The Blinn material can be located under **Create** → **Materials** in the visor.

- Double click on the new Blinn material to open the Attribute Editor.
- In the attribute editor Click on the Color swatch to the right of the word color to open the Color Chooser.
- Change the color to blue and click **Accept** to close the Color Chooser
- Increase the Transparency slider to about the mid range point



Creating a material in the Hypershade window

4 Assign the material to the jellyfish

- Select the jellyfish (the group node)
 - In Hypershade use the RMB on the Blinn shader (place the mouse pointer over the blinn shader ball and press the RMB) and select **Assign Material to Selection**
- If you are in shaded mode the surfaces should look similar to the blinn swatch.

ANIMATE THE JELLYFISH

- 1 Open the file `jelly2.ma` or continue from the last step
- 2 Press **F2** to switch to the Animation menu set
- 3 With the jellyfish node selected, **Deform** → **Create Nonlinear** → **Squash**

Note: Drag selecting across the jellyfish body will not select the *jellyfish* node at the top of the hierarchy. With the body selected, press the Up Arrow key. This will walk up one node in the hierarchy. You can confirm this by checking that the Channel Box now displays the *jellyfish* node.

4 Parent the squash deformer to the jellyfish node

- In Window → Hypergraph... MMB drag/drop the squash1Handle node onto the jellyfish node
If you don't do this when you move the jellyfish node the squash deformer won't follow it.

Note: If you do not see the nodes in the Hypergraph window, press **a** to frame all of the nodes in the window.

5 Select the jellyfish node and set keyframes

- Drag the timeslider to 0 and keyframe the Y translate of the jellyfish by selecting Translate Y in the Channel Box and RMB → Key Selected

Note: You may need to set the range slider minimum value to 0 so that frame 0 is included in the time range.

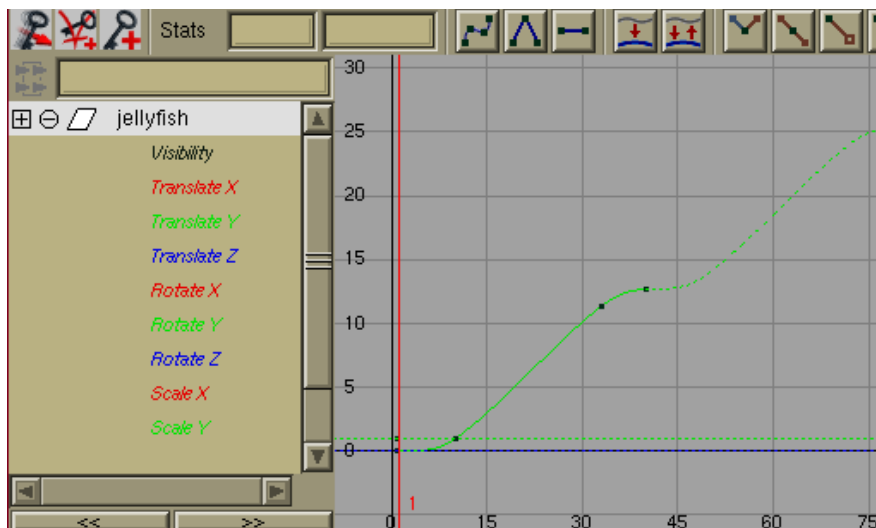
- Drag the timeslider to 10 and RMB → Key Selected (with Translate Y selected in the Channel Box)
- Drag the timeslider to 30, Move the jellyfish up about 10 units and RMB → Key Selected
- Drag the timeslider to 40 and RMB → Key Selected

6 Cycle the animation

- In Window → Animation Editors → Graph Editor, select the *Translate Y* and Curves → Post Infinity → Cycle with Offset

To select the y translate curve you can select the green curve in the **Graph Editor** or click on the *Translate Y* attribute name in the **Graph Editor**.

- In the **Graph Editor** select View → Infinity in order to see the cycled curve. It will be represented by a dotted line.



The jellyfish Y Translate curve cycling with offset in the Graph Editor

7 Select the Nonlinear Squash deformer and animate it

- select *squash1Handle*
- Drag the timeslider to 0
- set Factor to about -0.2
The *Factor* attribute is found in the **Channel Box** when you click on *squash1* under the **INPUTS**
- keyframe the *Factor* of the squash by selecting *Factor* in the Channel Box and RMB → Key Selected.
- Drag the timeslider to 20, set Factor to about 0.5 and RMB → Key Selected
- Drag the timeslider to 40, set Factor to about -0.2 and RMB → Key Selected

8 In Window → Animation Editors → Graph Editor, select the Factor and Curves → Post Infinity → Cycle

9 Press play to view the animation

ADD TENTACLES WITH PAINT EFFECTS

1 Open the file jelly3.ma or continue from the last step

2 Press F5 to change to the Rendering menu set

3 Select the body of the jellyfish

4 Activate Paint Effects with Panels → Panel → Paint Effects

5 Select Paint Effects → Make Paintable while the jellyfish is active

6 Reset the template brush with Paint Effects → Reset Template Brush

7 Paint Effects → Template Brush Settings... and set the following Brush options:

Global Scale: 5

▪ Tubes

Tubes: On

Creation (sub menu of Tubes)

Tubes Per Step: 1

Length Min: 1.5

Length Max: 2

Tube Width 1: 0.02

Tube Width 2: 0.01

Segments: 100

Elevation Min: 1

Elevation Max: 1

Behaviour Forces Gravity: 0.1

Momentum: 0

Length Flex: 0.45

Behavior → **Turbulence** (sub menu of Tubes)

Turbulence: World Displacement

Turbulence Interpolation: Smooth over Time and Space

Turbulence: 0.34

Turbulence Frequency: 2.4

Turbulence Speed: 0.155

▪ **Shading**

Color1: Blue

Incandescence1: Darker Blue

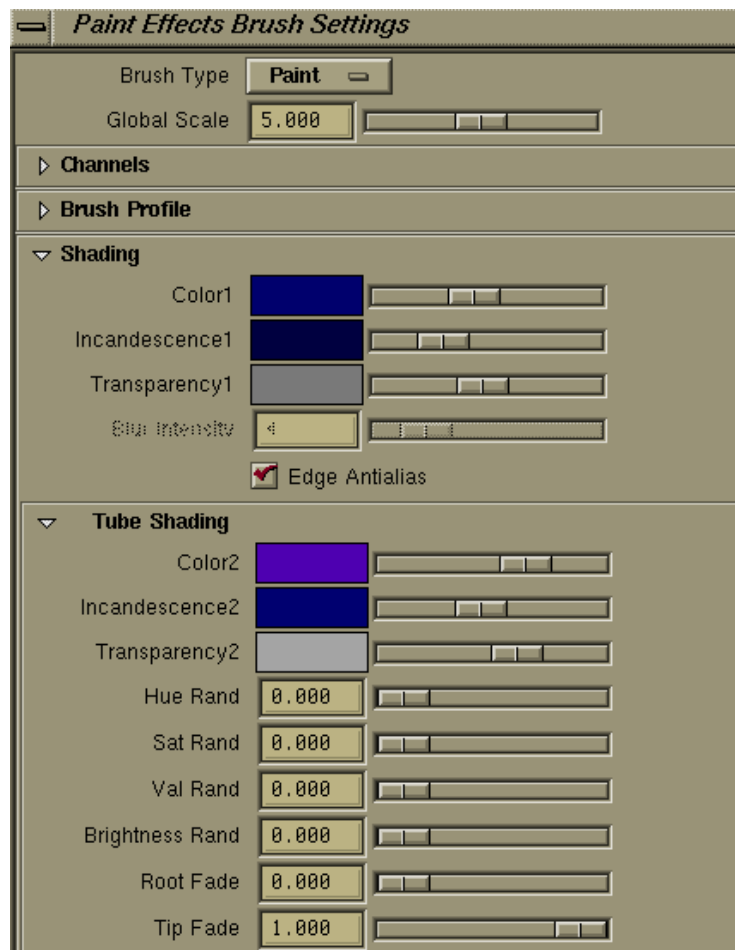
Transparency1: Medium

Tube Shading (sub menu of Shading)

Color2: Blue/Purple

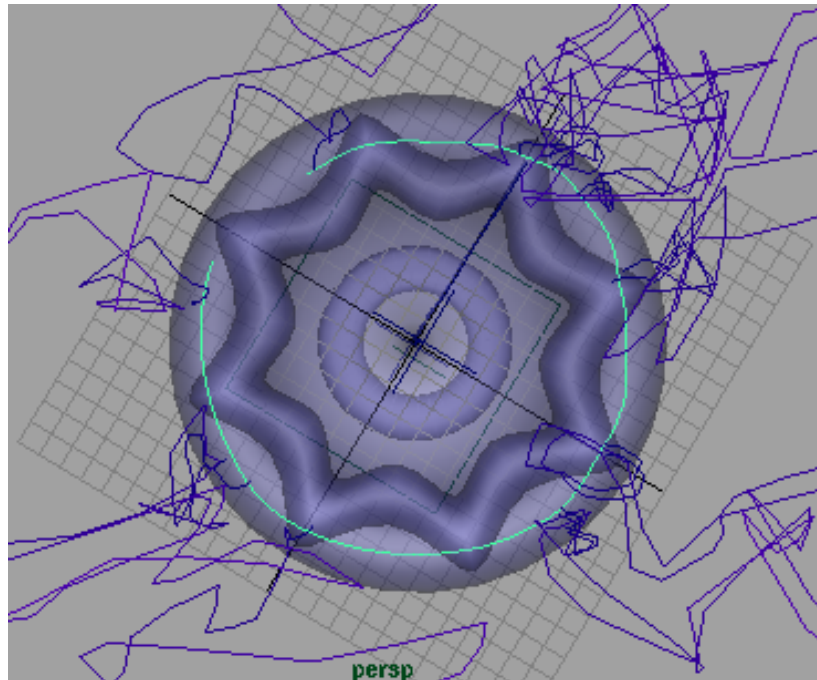
Incandescence2: Darker Blue/Purple

Transparency2: Medium



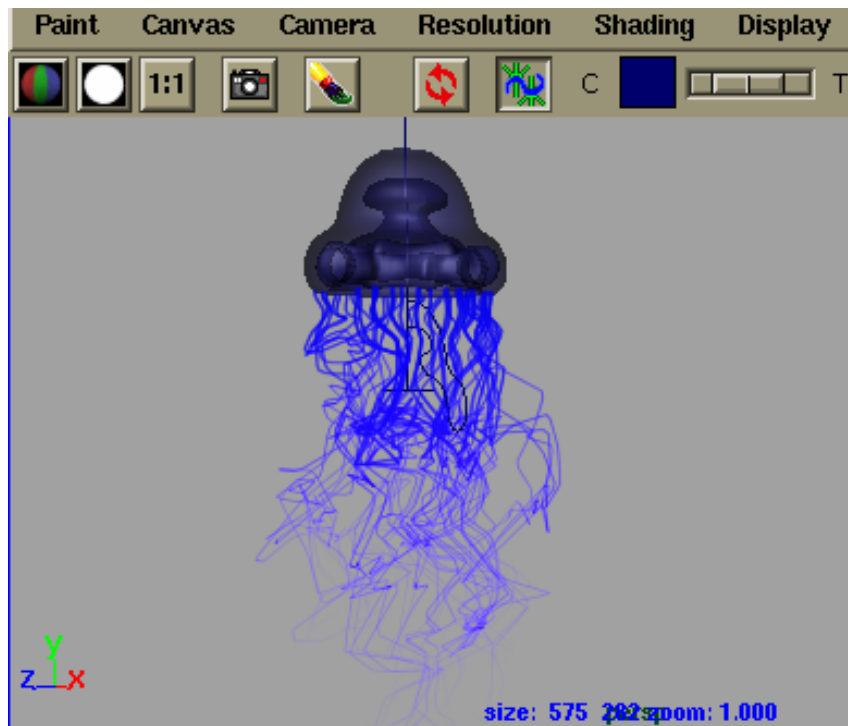
Paint Effects Settings

8 Paint a circular curve onto the bottom of the jellyfish



Paint a curve onto the jellyfish

- 9 Test the look of the jellyfish by pressing the Redraw Paint Effects View button that displays two red arrows flowing in a circle.



The jellyfish in the Paint Effects view

CONCLUSION

You have now explored some simple modeling, texturing and animation using Maya. To recap, this tutorial covered the following areas:

The following topics were discussed:

- Creating surfaces
- Transforming objects and components
- Basic texturing
- Nonlinear deformers
- Keyframe animation
- The Graph Editor for modifying animation curves
- Adding tentacles with Paint Effects

