

Week_22 Animation

Monday, February 20, 2023 10:28 AM

Greetings Trinity - Computer Animation Class
02/28/2024

Today's Class will be a review,
Then expand our knowledge of "Lighting" within Computer Animation,
lastly (with time) we will do something fun!

First a review of an important resource for you as a computer animator:

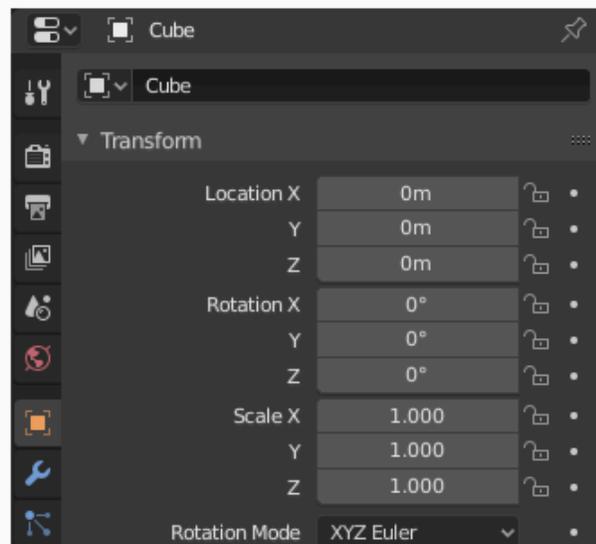
https://docs.blender.org/manual/en/latest/interface/window_system/workspaces.html

Properties

The Properties shows and allows editing of many active data, including the active scene and object.

Tabs

The Properties has several categories, which can be chosen via tabs (the icons column to its left). Each tab regroups properties and settings of a data type, and is documented in its own manual sections, linked below.

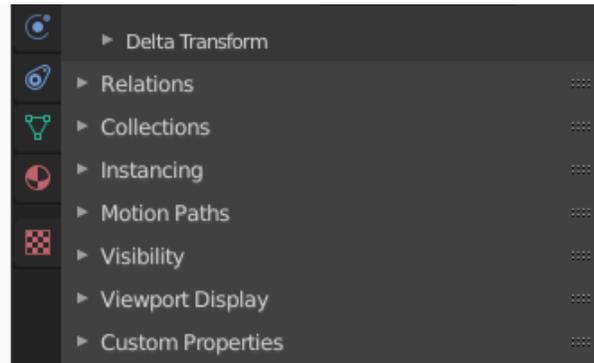


Active Tool and Workspace Settings

This first tab contains settings for the active **tool** (in the 3D Viewport) and the current **workspace**.

Scene

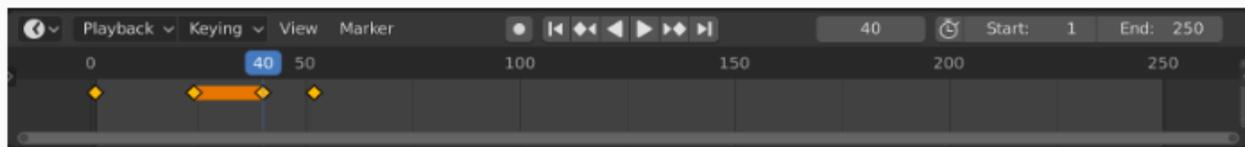
These tabs contain settings for the active scene.



The Properties. with Object properties shown.

Timeline

The *Timeline* editor, identified by a clock icon, is used for manipulating keyframes and scrubbing the Playhead.



The Timeline.

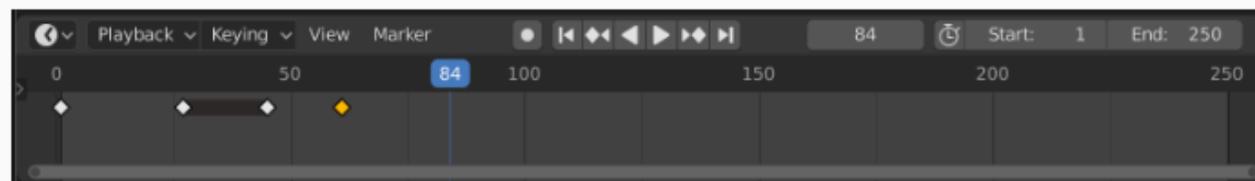
The *Timeline* gives the user a broad overview of a scene's animation, by showing the current frame, the keyframes of the active object, the start and end frames of your animation sequence, as well as markers set by the user.

The *Timeline* includes *Transport Controls*, to play, pause, and skip through an animation sequence.

It also includes tools for manipulating *Keyframes*, *Keying Sets*, and *Markers*.

Main View

The main *Timeline* region displays the animation frames over time.



Here you can see the *Keyframes* (diamond shapes), *Playhead* (blue handle), *Scrollbar* (along the bottom).

Adjusting the View

The *Timeline* can be panned by holding `MMB`, then dragging the area left or right.

You can zoom the *Timeline* by using `Ctrl-MMB`, the mouse `Wheel`, or pressing `NumpadMinus` and `NumpadPlus`.

You can also use the scrollbars, located at the bottom or the right of the editor, to pan and zoom the view.

<https://docs.blender.org/manual/en/latest/editors/timeline.html>

<https://www.youtube.com/watch?v=7DNmaR7TKwU>

Next:

Lets expand our knowledge about lighting, one may ask how does a computer animation use light?

Important lighting techniques for computer animation include key lighting for main illumination, fill lighting to reduce shadows, back lighting for highlights, ambient lighting for general illumination, rim lighting for subject separation, three-point lighting for balance, global illumination for realistic interactions ...

Lighting Resource:

<https://dreamfarmstudios.com/blog/the-ultimate-guide-to-lighting-fundamentals-for-3d/>

<https://www.youtube.com/watch?v=RDbrOpnIY7Q>

What is 3D lighting?

3D Lighting is the collection of tools and techniques used to simulate light in a computer-generated 3D environment. 3D Lighting techniques offer a huge amount of flexibility regarding the level of detail and functionality. They also operate at different levels of complexity. Lighting artists can choose from a variety of light sources, effects, tools, and techniques that suit their needs.

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Just like photography or filming, the lighting stage of the **3D animation pipeline** is all about making a 3D scene or sequence visible in a specific way through setting up different sources of light. Lighting is especially important in a 3D animation because it must support the story, convey the mood of a shot and also visually depict the location, time of day, and even the weather convincingly.

These factors have a much heavier weight when it comes to longer projects. Creating a consistent lighting scheme across the entirety of a 3D feature film or television show is one of the biggest challenges the lighting department of a 3D animation studio will be up to.

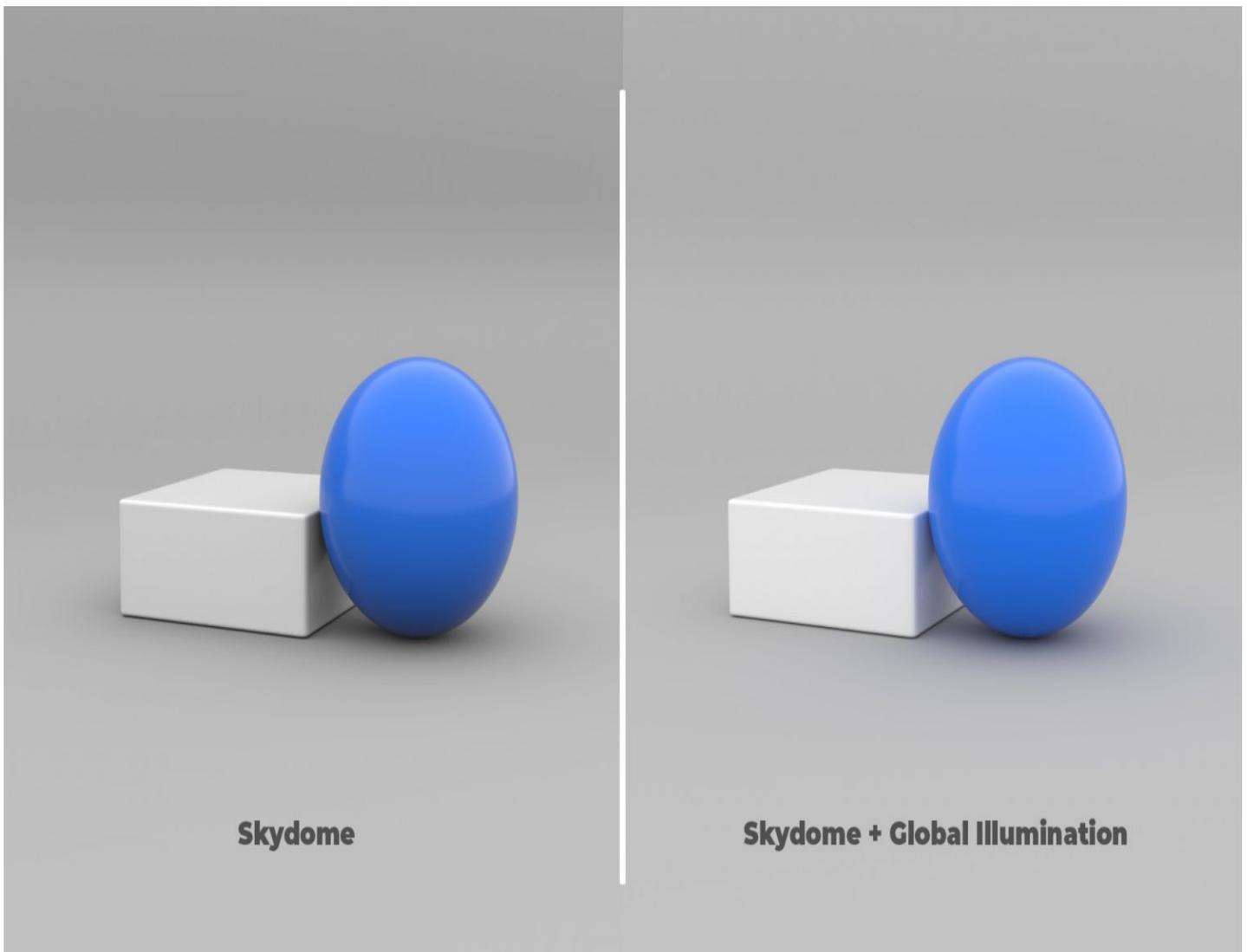
Different types of 3d lighting effects in animation

The kind of light we see around us in the real world is in fact a complex combination of ambient light plus different additional light sources. A huge part of the light we see every day is the actual light from a distant burning star illuminating our sky and bouncing countless times in the environment. That's why out of direct light, objects are rarely completely dark.

High-end rendering engines, produce high-quality ambient lighting that can create extremely convincing scenes. Standard rendering engines however create a somehow similar effect by adding a lighting value to all the pixels in the image. Global Illumination (GI) and Skydome are two of the most used algorithms used in 3D animation studios like Dream Farm for creating convincing ambient lighting in 3D environments.

Skydome Lighting: Skydome is an effective tool to simulate light from a dome above the scene; representing the sky. It can even be used with HDR images to perform image-based lighting too. Skydome is mostly used for outdoor scenes but can also be implemented for indoor scenes when needed.

Global Illumination: Global illumination algorithms calculate light traveling throughout the entire scene. Such algorithms not only take direct illumination into account but also calculate indirect illumination in which light rays from the same source are reflected by other surfaces in the scene. Thus, they create a very realistic illumination that pretty much resembles what we see in the real world.



Different types of light sources can be used in combination with these two. Take a quick look at some of them to better understand the unique properties and potentials of each; combined with GI and Skydome. Experimenting with these tools and techniques can take you to a point where you can effectively simulate the real-world lighting in a virtual environment:

How do you become a 3D lighting artist?

Lighting is an important element for any 3D animation. 3D animation lighting professionals are very similar to film lighting artists and artistic painters. They must be able to create a specific mood in a shot or sequence or show every detail of an object by lighting.

The 3D lighting artist is also responsible for the coherence of the lights on each sequence and the whole 3D animation; especially in bigger productions. Once productions reach a certain size, quality and time factors make it impossible for animation studios to produce full projects by 3D generalists. That's why bigger 3D animation studios diversify their CG workforce into professional teams consisting of dedicated modelers, riggers, animators, texture artists, and lighting professionals.

It will be important for a 3D lighting artist to pick software such as Autodesk Maya and master it. Their knowledge and experience in whichever software they use to light up the characters and sets should be used to contribute to the 3D animation's atmosphere. But it won't be enough. They must understand how light behaves and have a comprehensive knowledge of light, color and how different materials or textures work under different types of light.

