Autodesk®
Maya®
2012

Autodesk

What's New

Autodesk ® Maya® 2012

Disclaimer

Contents

What's New

What's New

What's New in Autodesk Maya

Welcome to What's New in Autodesk® Maya® 2012.

Maya 2012 delivers new toolsets for previsualization and game prototyping, extends the simulation feature set, and opens the way for better pipeline integration.

With a high-performance viewport; the ability to create node-based representations of render passes; an expanded camera sequencer toolset; and new camera rigs, artists can refine and present their ideas prior to final production. And, editable motion trails offer an enhanced animation experience.

In addition, enhancements of the Nucleus solver and its modules, combined with new physics solvers, help you create a wider range of convincing effects in less time.

Similarly, single-step interoperability between Autodesk products, a consistent f-curve editor across products, and new support for vector displacement maps make Maya 2012 easier to integrate into production pipelines.

Watch the Maya 2012 Feature Highlights video, and read the sections below for more information about all the new features in this release.

General and Performance

New to Maya 2012 are several single-step workflows to make sending scene data between Autodesk 3D applications seamless. In addition, several performance

improvements have been made this release in the Dynamics and nDynamics areas, and Viewport 2.0.

- What's New in General (page 6)

- What's New in Performance (page 6)

Basics
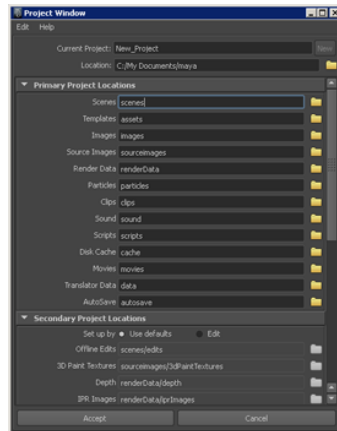
A newly designed **Project Window** provides greater flexibility for accessing and editing the location of your project files. An improved default project structure makes it easier to manage project directories as well as to create custom directories for plug-in data.

See What's New in Basics (page 7).

Assets and File Referencing
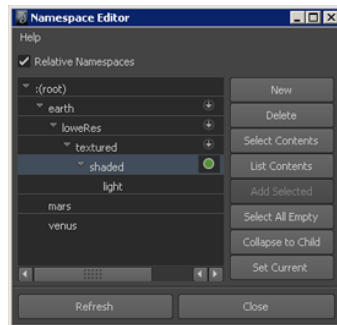
A new **Namespace Editor** design gives you more control creating and managing the namespace organization of your scene objects. Feature improvements include object lists in a pop-up window, better namespace hierarchy display, and more.

See What's New in Assets and File Referencing (page 9).

Modeling

The new **Send to** feature provides an easy, single-step method of sending objects and various forms of data from Maya to Mudbox.

The new **Interactive Split tool** is one of several new options available through the **Edit Mesh** menu. It allows you to accurately split faces on a polygon mesh. Additionally, the new **Project Curve on Mesh** option lets you project curves on a polygon surface, while the new **Split Mesh with Projected Curve** option lets you split and detach edges on a polygon surface.

There are also three new sliders associated with the **Show Manipulator Tool**.

See What's New in Modeling (page 10).
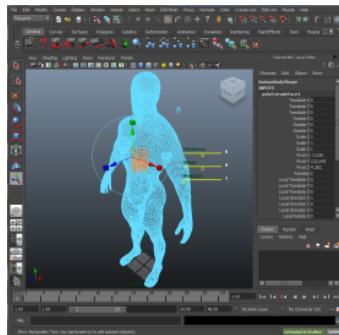
Animation

Editable Motion Trails provide animators with a fast workflow for editing the position and timing of keys, directly in the Maya scene. Motion trails display with your animated models, eliminating the need to leave your scene for the **Graph Editor**.

Updates to the **Camera Sequencer** include a new playlist for more efficient shot management, improved multi-track audio, and the addition of the **Ubercam**, which lets you quickly output all shots to a single camera.

In addition, several improvements to the **Graph Editor** provide a more streamlined and familiar curve

editing tool, particularly for animators using multiple Autodesk applications in a pipeline. New options and preferences include the Auto tangent type, adjacent key snapping, single-click curve editing, plus the **Region Tool** for scaling multiple keys.

See .

Rigging
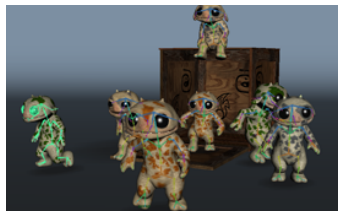
New HumanIK character setup tools in Maya improve both keyframing and retargeting workflows, with a focus on visual, intuitive tools, plus streamlined interoperability with Autodesk MotionBuilder. Unified tools between Maya and MotionBuilder let you easily retarget motion capture animation from MotionBuilder and apply to rigs set up in Maya.

See .

Dynamics and nDynamics
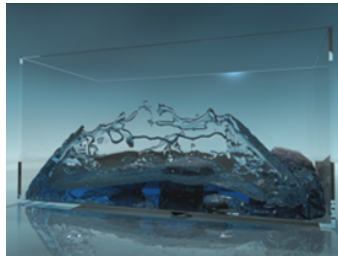
New Fluid Effects simulation methods let you create realistic liquid pouring, splashing, and boiling effects. Other additions to Fluids include new output mesh options, improved auto resizing, and a number of new attributes to enhance the look and behavior of your effects.

Further development of the Nucleus unified simulation framework includes multi-threaded nParticle collisions and nCloth self-collisions for faster performance, per-object local gravity and wind for greater control over Nucleus forces, and rigid nCloth shells for small-scale destruction effects.

The addition of **Effects Assets** provide a wide range of easy-to-use, customizable effects, including fire, smoke, explosion, dust trail, melt, and fireworks.

For the Autodesk Maya Entertainment Creation Suites, Dynamics and Effects provides single-step Softimage

ICE interoperability which lets you take advantage of the ICE (Interactive Creative Environment) to create effects for your Maya scenes.

See

Rendering and Render Setup

You can now easily create render pass nodes through the **Hypershade** and view the output of these passes directly in the **Render View**. Furthermore, you can create basic compositing graphs using render passes, render targets, and standard Maya shading utility nodes, and visualize the result directly in the **Render View** or via a batch render.

New **Viewport 2.0** features include improved support for most parts of Maya, for example, manipulators, tools, shapes, and nodes. New effects such as screen-space ambient occlusion, motion blur, depth of field and multisample anti-aliasing are also included.

Two new performance options are provided for Viewport 2.0: **Use Vertex Animation Cache** and **Thread Dependency Graph Evaluation**.

You can also preview Ptex textures assigned to any standard Maya shading network texture input in **Viewport 2.0**.

In addition, the new **Maya Hardware 2.0** renderer allows you to perform command line rendering for **Viewport 2.0**, or to batch render to disk or to **Render View**.

See

Documentation

Read about changes to how we deliver Maya Help, Maya API and other learning resources to you. In addition, you'll find information about new learning resources available to you.

See .

API

Beginning Maya 2012, you can use the new extension attributes feature to add attributes to a given node class so that they appear as static Maya attributes.

See .

The API Guide and API reference are now a separate part of the Maya help and includes new features such as: more links from the API Guide to API elements such as classes and functions, and color coded syntax in example code in the API Guide.

See *http://www.autodesk.com/maya-sdkdoc-2012-enu*.

What's New in General

Interoperability

You can now send new scene data or updates to currently open scenes from Maya to Softimage, MotionBuilder or Mudbox. You can access the new one-click options from the **File** menu.

New options added to cmdScrollFieldExecutor command

New options have been added to the cmdScrollFieldExecutor command, including: a case sensitive replace all, a flag to query the total number of lines, and a flag to enable wrapping of the search function. For more information, see the Commands documentation and the release notes.

Improved Direct Connect support

Direct Connect support has now been updated to Direct Connect 2012 on the Windows and Mac OS X operating systems, and Maya 2012 supports the importing and exporting of more file formats, as well as better parity between Windows 32-bit and Windows 64-bit systems.

What's New in Performance

The following sections describe some performance improvements in Autodesk Maya 2012.

General

■ Improvement with MDGContext matrix evaluation: evaluating of multiple matrices within the same frame time is improved.

■ Two new options have been provided to improve performance with **Viewport 2.0**: **Vertex Animation Cache** and **Thread Dependency Graph Evaluation**. See *Renderer > Viewport 2.0* for more information.

■ Performance optimizations reduce save times for Maya Ascii (.ma) files, particularly for scenes containing large meshes.

Dynamics and nDynamics

■ Improvements to Fluid Effects includes enhancements to the interactive draw and fluid output meshing. See What's New in Fluid Effects (page 21).

■ Additional Nucleus solver threading improves the performance of playing back nCloth and nParticle simulations. See What's New in nCloth (page 26) and What's New in nParticles (page 28).

What's New in Basics

Updates to the Project Window

An improved **Project Window** makes it easier to organize and customize Maya project files. These updates include:
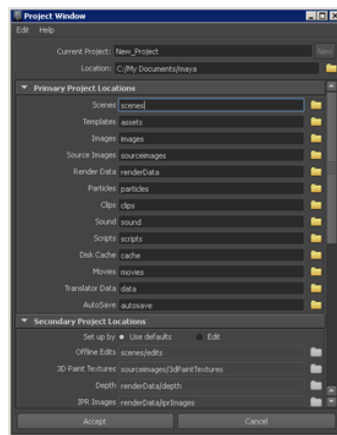
Primary and secondary project locations

When you create a new project from the **Project Window**, Maya now organizes project files into primary and secondary project locations. Primary project locations provide directories for essential project data such as scene files, texture files, and rendered image files. Secondary project locations are sub-directories created in the primary locations to provide additional project management.

You can specify different locations for each primary project directory and secondary project sub-directories, as well as provide custom directory names. A new

browse feature lets you quickly navigate to the desired location for each project directory.

Translator and custom data locations

The Project Window also provides customizable directories for translator data. You can use the default locations or specify custom locations that better correspond to your production pipeline.

You can also add new custom directories to your Maya project using the **Add new file rule** command.

Help preferences

New **Help Location** options have been added to the Maya **Preferences** to accommodate the new way that Maya Help is published.

Selection preferences

There are three new modifiers available in the **Selection** section of the **Preferences** window:

- **Auto-select asset**
- **Track selection order**
- **Selection type effects active**

What's New in Assets and File Referencing

Namespace Editor improvements
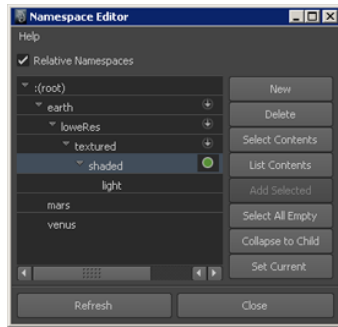
Improvements to the **Namespace Editor** give you more control creating and managing the namespace organization of your scene objects. The editor features a new tree-view display making it easier to view namespace hierarchy.

Other improvements include:

■ **List Contents** now displays the list of objects in a pop-up window rather than just in the **Script Editor** window.

■ **Select All Empty** makes it easy to select and operate on all empty namespaces.

■ **Collapse to Child** removes empty ancestor namespaces.

■ **Set Current** provides a visual indicator and control for the current namespace.

Retry missing reference files

A **Retry** option has been added to the **Reference file not found** window. You can now locate missing reference files, restore them to original referenced location, and then click **Retry** to load them into the scene.

What's New in Modeling

Send Objects to Mudbox
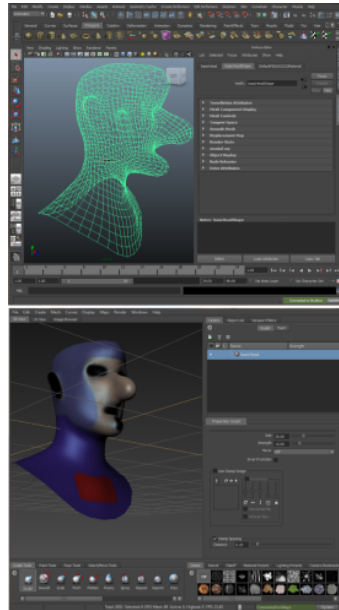
You can now send objects from Maya to Mudbox using the Send To options from the **File** menu. Once you have modified an object in Mudbox, you can then send it back to Maya.

The one-click functionality allows you to send various forms of data, including meshes and UVs on meshes, to Mudbox. This data can be sent as a new scene or as an update to an existing scene.

The Send to options for Maya is a feature of the Autodesk Entertainment Creation Suites.

Edit Mesh updates

There are several new **Edit Mesh** menu updates, including:

- The **Project Curve on Mesh** option, which allows you to project curves onto a polygon surface.

- The **Split Mesh with Projected Curve** option, which allows you to split and detach edges on a polygon surface.

- The **Interactive Split Tool**, which allows you to split faces on a polygon mesh.

- The new **Curve** options in the **Extrude Face Options** window, which allow you to generate and position a curve automatically.

Show Manipulator Tool updates

There are new sliders associated with the **Show Manipulator Tool**, which allow you to modify thickness, offset and division values.

Marking menu updates and additions

The following table lists updates and additions to the Maya marking menus.

Marking menu	Update/addition
Poly Edge	■ **Flip/Spin Edge** sub-menu added. ■ **Detach Components** added. ■ **Connect Components** added.
Poly Face	■ **Assign Invisible Faces** added. ■ **Connect Components** added.
Move, Rotate, and Select Tool	■ **Soft Select** toggle removed ■ **Object** mode toggle added
Scale	■ Menu items reordered ■ **Axis** sub-menu added, which includes options for scaling axis. ■ **Normal Average**, **Object**, **World** scaling added ■ **Soft Select** toggle removed ■ **Object** mode toggle added
Poly Vert	■ **Connect Components** added.
UV Editor Comp Convert	■ **To Border** removed ■ **To UV Edge Loop** added.

What's New in Animation

Editable motion trails
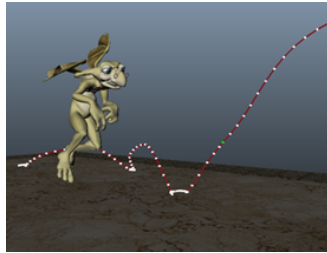
New editable motion trails let you preview your animation and interactively adjust keyframes within the 3D scene. Motion trails provide a visual representation of keys right around your animated models, letting you adjust the timing, keys, tangents, and position of animation directly.

Graph Editor improvements
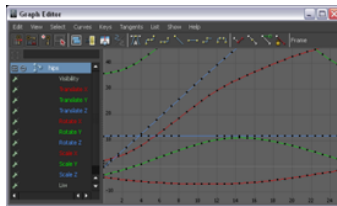
Several new options and preferences have been added to the **Graph Editor** to enhance curve editing workflows. In particular, animators who work with multiple Autodesk applications can expect increased consistency across curve editing tools. **Graph Editor** improvements include:

Adjacent key snapping

A new preference lets you set neighboring keys to automatically align as you edit. Depending on your keyframe editing style, keep **Snap Values to Adjacent Keys** enabled to make similar, adjacent keys snap to identical values.

Auto tangent type

As you move keyframes in the graph view, **Auto** tangents can automatically self-adjust to ensure smooth transitions, without overshooting maximum and minimum values. **Auto** tangents can save animators valuable time when roughing out animation, as tangents are naturally adjusted to avoid creating spikes.

This tangent type is common to several other Autodesk applications, and is the new default tangent type for new keys (set as the **Default in tangent** and Default out tangent in your **Animation** preferences).

Isolate selected curves

Quickly narrow your focus in the graph view by showing only the curves you want to work with. The new **Curves > Isolate Curve** option lets you easily view curves for selected channels only.

Scale multiple keys

The new Region tool provides a simple, more visual mechanism for scaling multiple keys in time and value. Select the **Region Tool** from the **Graph Editor** toolbar, select the region of curves you want, then drag the region handles to scale.

Simplified toolbar option

The **View** menu now includes a **Classic Toolbar** option which toggles the **Graph Editor** between the classic, full toolbar, and a more simplified toolbar that displays a smaller set of options. Switching off **Classic Toolbar** gives animators who primarily use Maya as part of a suite a more streamlined display of curve editing tools.

In addition, several **Graph Editor** icons have been refreshed for this release.

Single-click curve editing

A new **Left Mouse Button Alters Selections** preference, on by default, lets you adjust selected keyframes with a single click. With this preference enabled, you can simply click and drag to move a selected keyframe in the graph view area. This keyframe manipulation mode will be familiar to animators who already use curve editing tools in other Autodesk products such as MotionBuilder.

Tangent type feedback

The **Graph Editor** now provides visual feedback on the tangent type of selected keys. If all selected keys have the same tangent type, the appropriate tangent icon is highlighted in the **Graph Editor** toolbar. If the selected keys have different tangent types, no feedback displays.

Camera Sequencer updates

Ubercam

Create an ubercam to playback all camera shots in a sequence using a single camera.

When you create an ubercam, the **Camera Sequencer** bakes camera parameters from each shot to this single camera, letting you conserve camera switches. If you modify the source cameras in your shots, simply recreate the ubercam to update.

Shot Playlist window

The new **Shot Playlist** window lets you quickly edit camera shot parameters, such as shot length or the camera used.

Additional Playblast options

- **Resolution Width** and **Resolution Height** added to **Playblast Sequence** options
- **Offscreen render** option for playblasting (**Playblast Shot**, **Playblast Sequence**, and **Re-playblast Shot Options**)

Multi-track audio

(Windows and Linux only) You can now add multiple audio tracks to a sequence.

Interoperability with Autodesk Smoke

Several enhancements to the **Camera Sequencer** let you produce XML files that can be imported in Autodesk Smoke.

Synchronized Channel Box, Graph Editor, and Time Slider

Two new items in the **Channels** menu of the **Channel Box** let you set whether to synchronize your selections in the **Channel Box** to the **Graph Editor** and **Time Slider**. When **Sync Timeline Display** is on, selecting channels in the **Channel Box** also filters the **Time Slider** to display only keys for those channels, and only those selected channels are keyed if you set a keyframe. When **Sync Graph Editor Display** is on, only curves for those selected channels display in the **Graph Editor**.

Craft Animations plug-in

Maya now includes pre-rigged models of two cars and two planes from Craft Animations, as well as the Craft SoftMotionCam, ObserverCam, MultiStateCam, and HumanizerCam camera rigs.

You can use the vehicle rigs to quickly set up your existing vehicle models for animation, control the vehicles using custom input devices, and record keyframe animation of the vehicle actions and your camera rigs.

For complete documentation on the Craft Animation rigs and cameras, use the Help menu in the Craft Animation Director Studio plug-in window. For more information on Craft Animation, see *http://www.craftanimations.com*.

Motion capture samples

The **Visor** window now includes additional motion capture example files that you can use with the character animation retargeting tools.

To find the mocap examples, open the **Visor** (**Window > General Editors > Visor**) and switch to the **Mocap Examples** tab. The additional files are organized under male and female character groupings in the navigation panel.

What's New in Rigging

New HumanIK character setup tools

Two new character setup tools improve your HumanIK character workflow.
These tools are designed to build on the existing HIK retargeting workflows,
and add new features for keyframers, such as keying groups and rig
synchronization.

Select **Window > Animation Editors > HumanIK** or **Skeleton >
HumanIK** to access these new tools, along with the existing **Skeleton
Generator** tool.
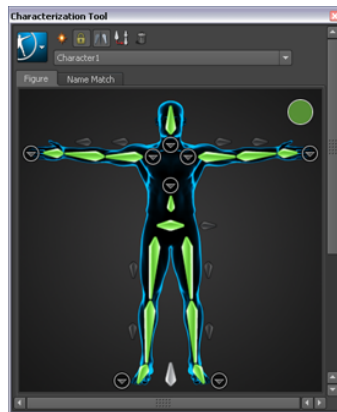
Characterization Tool

The new **Characterization Tool** provides character
animators with an improved, more visual tool for
mapping and defining the structure of HumanIK
characters.

Designed to allow a streamlined, consistent workflow
with other Autodesk applications, the **Characteriza-
tion Tool** helps to enhance your HumanIK character
animation pipeline, with improved error reporting and
an intuitive, visual interface.
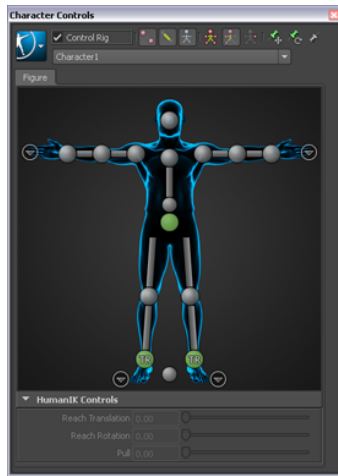
Character Controls window

The new Character Controls window gives you a visual interface for interacting with the FK and IK effectors on your Control rigs.

The **Character Controls** let you activate different manipulation and keying modes depending on whether you want to work on the entire body, specific body parts, or only the current selection. The **Figure** representation gives you constant visual feedback on which parts of the character are active for keying, reach and pull values.

Other controls let you quickly pin and unpin Control rig effectors, create auxiliary and pivot effectors, and adjust the reach and pull properties between a Control rig and its retargeting source.

NOTE

With the addition of superior full body rigging and animation capabilities with HumanIK in this release of Maya, the former full body IK (FBIK) solution has been removed. You can still load your existing scenes with FBIK rigs, however all FBIK menus and options have been removed from Maya by default.

For archived information on FBIK, including instructions for restoring the FBIK menus and options in Maya, you can find a Full Body IK reference guide on the Maya documentation **Archives** page at *http://www.autodesk.com/maya-docs-archive*.

Other HumanIK keying workflow improvements

■ Keying groups in **Time Slider**, **Graph Editor**, and **Dope Sheet**

■ Improvements to animation layers and retargeting workflow

■ Autokey support for HIK keying groups

MotionBuilder interoperability

You can now use Send to commands to transfer HumanIK character data between Maya and MotionBuilder. This means you no longer need to export your characters from Maya to FBX to import them into MotionBuilder. To see

the **Send to MotionBuilder** commands in the Maya **File** menu, you must have MotionBuilder installed on your computer.

MotionBuilder interoperability is a feature of the Autodesk Entertainment Creation Suites.

Improved joint orientation behavior when moving joints

When you move joints, the joint rotation axis of the parent is now automatically adjusted so that it continues to point down the bone. A new **Automatically Orient Joints** setting in the **Move Skinned Joints Tool** and the **Move Tool** lets you turn this behavior on or off.

Deformer enhancements

Export and import deformer weights

You can now export and import deformer weight maps in XML format. New items added to the **Edit Deformers** menu let you export and import skin weight data, providing an easy way to transfer weights from one character mesh to another.

What's New in Dynamics and nDynamics

General

Effects Assets
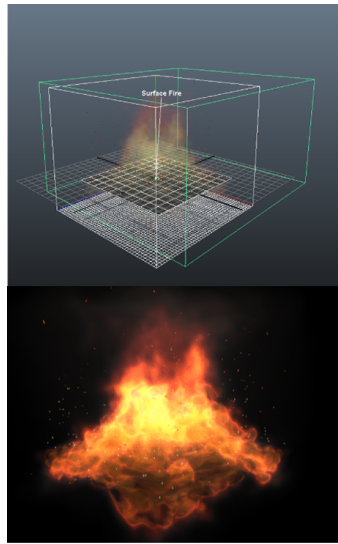
Maya now includes a number of preset effects called Effects Assets. Building on the Maya Asset framework and simulation toolsets, Effects Assets present the most relevant attributes for an effect, making them easy to customize for your scenes. Effects Assets are available in the **Visor** window.

ICE Interoperability for Maya
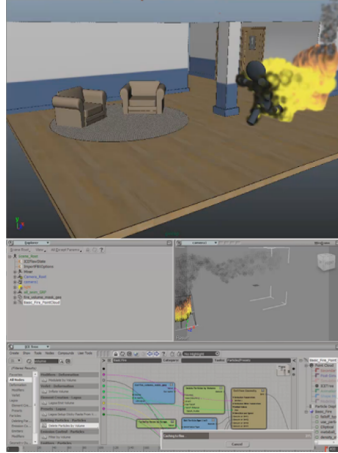
Maya now includes a one-click interoperability workflow that lets you transfer data between Maya and Softimage. Using Send to commands, you can export a scene to Softimage, add a Softimage ICE particle or deformation effect, then send the scene back to Maya.

ICE interoperability for Maya lets you take advantage of the ICE (Interactive Creative Environment) to create effects for your Maya scenes.

ICE interoperability for Maya is a feature of the Autodesk Entertainment Creation Suites.

New Nucleus node attributes

Maya 2012 includes the following new Nucleus node attributes:

Transform Attributes

The Nucleus node now includes **Transform Attributes** and other Maya transform node properties. You can now create parent-child relationships with other objects in your scene. When you parent the transform node to another object, the simulation takes place in the local space of the Nucleus node, rather than in worldspace. A **Use Transform** attribute enables the transform properties.

When **Use Transform** is on, you can set the **Transform Attributes** attributes to specify the scene location of the Nucleus gravity and wind. The bounding box at the location defined by the **Translate** X, Y, and Z values determine the area affected by the Nucleus forces.

Visibility

When on, arrows appear in the scene to display the location and direction of Nucleus **Gravity** and **Wind**. **Visibility** also displays the location of the Nucleus plane when the **Use Plane** attribute is on.

PhysX for Maya plug-in

Maya now includes the NVIDIA® PhysX® for Maya plug-in which lets you take advantage of using GPU-accelerated physics simulations in your Maya scenes. The plug-in lets you create dynamic, kinematic, and static rigid bodies from meshes created in Maya. You can then join the rigid body objects with PhysX constraints.

The PhysX plug-in also includes kinematic ragdoll simulations and APEX Clothing.

PhysX for Maya is available for Windows systems only. For more information on PhysX, see *http://www.nvidia.com*.

For documentation on the PhysX for Maya plug-in, browse to the *Documentation* folder located in the PhysX installation directory.

Digital Molecular Matter plug-in for Maya

The DMM™ (Digital Molecular Matter) plug-in for Maya from Pixelux Entertainment™ is now included with Maya 2012. The plug-in helps you create highly realistic shatter, destruction, and deformation simulations that can include multiple interacting materials. The DMM plug-in available with Maya will solve up to 1500 tetrahedrals.

The DMM plug-in is available for Windows, Mac OS X, and Linux systems. For more information about using the DMM plug-in see *http://www.pixelux.com*.

Fluid Effects

Liquids attributes

A number of new **Liquids** attributes let you generate fluid effects that look and behave like real liquids.

These new attributes include:
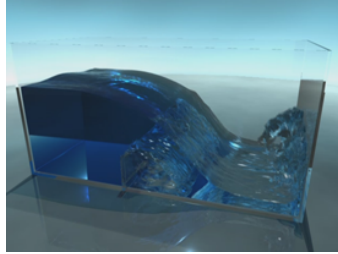
Liquid Method

New liquid simulation methods let you select a solver that best suits your effect. When **Enable Liquid Simulation** is on, you can select either **Liquid and Air** or **Density Based Mass** as your **Liquid Method**.

Liquid Min Density
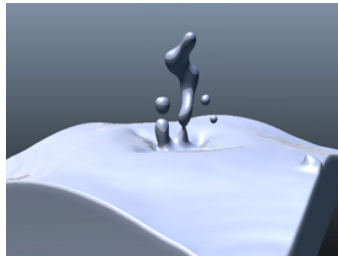
Specifies the density value at which the solver differentiates between liquid and air when the **Liquid and Air** simulation method is used. Liquid densities are calculated as incompressible fluids while air is fully compressible.

Liquid Mist Fall
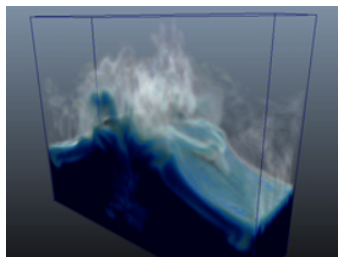
Applies a downward force to areas in the fluid that have density lower than the value specified by the **Liquid Min Density** attribute. When **Liquid Mist Fall** is set to 0, no force is applied. Increasing the attribute value increases the strength of the downward force.

Mass Range
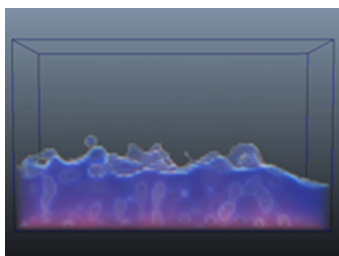
Defines the relationship between mass and fluid density when the **Density Based Mass** simulation method is used. At high **Mass Range** values, dense regions in the fluid are much heavier than the empty regions, simulating a relationship similar to water and air.

Tension Force
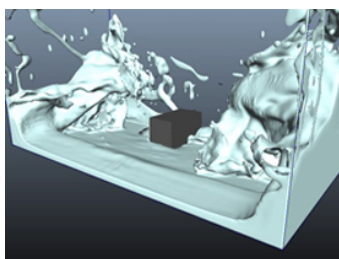
Applies a force that simulates surface tension based on the density in the grid. **Tension Force** is similar to **Density Tension**, but rather than modifying density values, **Tension Force** modifies momentum by adding small amounts of velocity to the fluid.

You can use **Tension Force** with **Density Tension** to create realistic surface tension in your liquid effect.

Density Tension
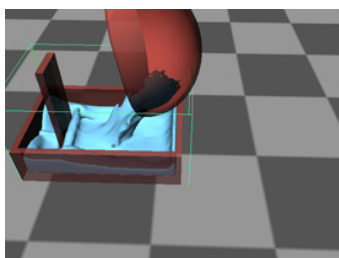
Smooths ranges of density into round shapes, making the density boundaries more defined in the fluid. You can use **Density Tension** to create effects that are similar to surface tension in liquids.

Density Pressure and Density Pressure Threshold
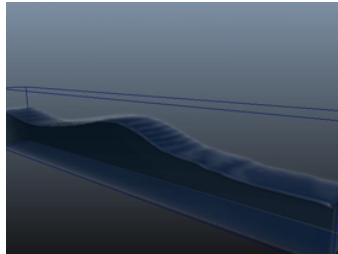
Applies an outward force to counter the compression that **Forward Advection** can apply to fluid density, particularly along container boundaries. In this way, the attribute attempts to conserve the overall fluid volume with no density loss. For example, in a water tank simulation, fluid may appear to collapse or drain without sufficient **Density Pressure**.

Density Pressure Threshold specifies the density value at which **Density Pressure** is applied on a per voxel-basis. For voxels that have density lower than **Density Pressure Threshold**, no **Density Pressure** is applied.

Density Pressure and **Density Pressure Threshold** can also be used with the default fluid solver method when **Enable Liquid Simulation** is off.

Fluid Output Mesh performance improvements and additions

Maya 2012 includes meshing performance improvements and new output mesh attributes.
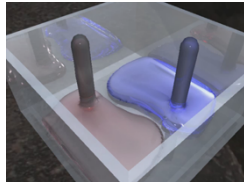
Mesh Method

Using **Mesh Method**, you can now choose the type of polygon mesh used to generate your fluid output mesh.

Mesh Smoothing Iterations

You can apply smoothing iterations to your output mesh to increase quality and uniformity of its surface.

Fluids output mesh performance improvements

Maya 2012 includes performance improvements when converting a fluid object to a polygon mesh. These improvements are most noticeable when using **Triangle Mesh** or **Quad Mesh** as the **Mesh Method**.

Air/Fuel Ratio

Sets the amount of air required to completely burn a set volume of fuel. For example, to burn a volume of gasoline requires 15 times more air than fuel. To simulate a gasoline fire, set **Air/Fuel Ratio** to 15.

You can access **Air/Fuel Ratio** from the **Fuel** section of the **Contents Details** attributes.

Pressure and Pressure Threshold

A new **Pressure** attribute has been added to the **Temperature** grid to simulate the effect of temperature on gases. The **Pressure** attribute simulates the increase in pressure that results when a gas gets hotter and quickly expands.

Pressure Threshold specifies the temperature value at which **Pressure** is applied on a per voxel-basis. For voxels that have temperature lower than **Pressure Threshold**, no **Pressure** in applied.

You can access **Pressure** and **Pressure Threshold** from the **Temperature** section of the **Contents Details** attributes.

Auto Resize Margin

Auto Resize Margin specifies the number of empty voxels added between the fluid container boundary and regions of positive density in the fluid. **Auto Resize Margin** lets fluids flow more naturally near auto-resized boundaries and is useful for fast-moving and low density fluids.

Auto Resize In Substeps

A new **Resize In Substeps** attribute lets you resize a fluid container each substep. In previous versions of Maya or when **Resize in Substeps** is off, fluids only resize one voxel per simulation step. With **Emit In Substeps** on, fast moving fluids resize more accurately especially when a higher number of substeps are used.

Emit In Substeps

A new **Emit In Substeps** allows fluid emission to be computed each substep rather than once per step. **Emit In Substeps** is useful for effects that have fast emission speeds such as explosions.

Fluid playback improvements

With improvements to the fluid interactive draw, fluid effects now play back faster. Better performance is most noticeable when playing back textured fluids or cached fluid effects. The interactive draw improvements also provide faster real-time manipulation (tumble, dolly, rotate) of fluid containers, particularly when using internal lighting (**Real Lights** turned off) for the effect.

nCloth

Rigid nCloth shells

You can now apply **Rigidity** and **Deform Resistance** to the individual polygon shells that make up your nCloth mesh. When meshes made from individual polygon shells are converted to nCloth, a new **Use Polygon Shell** attribute enables **Rigidity** and **Deform Resistance** on each shell. The shells then behave as individual rigid objects in simulations.

Use Polygon Shells is useful for creating simple destruction and other rigid self-colliding effects.

Local Force and Local Wind

New **Local Force** and **Local Wind** attributes let you apply gravity and wind to individual nCloth objects. These forces are applied locally and do not affect other Nucleus objects that are assigned to the same solver.

You can use **Local Force** to reduce or increase the effects of gravity on specific nCloth objects, making the garments appear lighter or heavier than other articles of a character's clothing. By adding **Local Wind**, you can create gusts of wind that act on specific areas of a character's clothing such as a flowing cape.

Collide Last Threshold

A new **Collide Last Threshold** sets whether or not a collision iteration is the last calculation performed each simulated step. **Collision Last Threshold** helps ensure that nCloth collisions with Nucleus objects are resolved at the end of a step, decreasing the chance of bad collisions in the subsequent frames.

Input Motion Drag

Using **Input Motion Drag**, you can now apply a force to an nCloth which is based on the motion of an animated input mesh. This force is derived from the difference between the current velocity of the nCloth object and the velocity of its animated input mesh. An **Input Motion Drag** value of 1 means that the force will cause the nCloth object to follow the same path as its input mesh. An **Input Motion Drag** value of 0 has no effect on the nCloth object. You do not need to have **Input Mesh Attract** set to use **Input Motion Drag**.

nCloth performance improvements

Additional Nucleus solver threading improves the performance of nCloth simulations. Better performance is most noticeable when playing back simulations with multiple nCloth objects connected to the same Nucleus solver. In this case, computations for self-colliding surfaces and stretch resistance are threaded.

Paintable attributes

A number of attributes have been added to the list of paintable nCloth properties. You can now can use the **Paint nCloth Attributes Tool** to create vertex maps and texture maps for the following attributes:

- **Bend Angle Dropoff**
- **Restitution Angle**
- **Damp**
- **Lift**
- **Drag**
- **Tangential Drag**

nParticles

nParticle performance improvements

Additional Nucleus solver threading improves the performance of nParticle collision detection, making large nParticle simulations faster particularly when **Enable Liquid Simulation** is on, and when nParticles are colliding with other Nucleus objects.

Local Force and Local Wind

New **Local Force** and **Local Wind** attributes let you apply gravity and wind to individual nParticle objects. These forces are applied locally and do not affect other Nucleus objects that are assigned to the same solver.

Particle color emission enhancements

You can now use the **Texture Emission Attributes**, such as **Inherit Color** or **Inherit Opacity** to color particles emitted from all emitter types. In previous versions of Maya, these attributes can only be used with **Surface** emitters. To use **Inherit Color** or **Inherit Opacity**, you must disconnect the corresponding internal shading ramp from the nParticleShape node. To do this, in the **Per-particle (Array) Attributes**, right-click on the per-particle attribute, and select **Break Connection**.

These enhancements are also supported by Maya classic particles.

What's New in Rendering and Render Setup

New Viewport 2.0 features

New **Viewport 2.0** features include improved support for most parts of Maya, for example, manipulators, tools, shapes, and nodes.

Two new performance options are provided: The **Vertex Animation Cache** option provides more interactive scrubbing of your animation, and the **Thread Dependency Graph Evaluation** option provides better performance by evaluating separate characters in separate threads.

New API support for plug-in shapes, hardware shaders, and locators is provided. Approximated support in the viewport is provided for mia_material_* shaders and other mental ray shaders. New effects include screen-space ambient occlusion, motion blur, depth of field and multisample anti-aliasing.

In addition, the new **Maya Hardware 2.0** renderer allows you to perform command line rendering for **Viewport 2.0**, or to batch render to disk or to **Render View**. You can access the **Hardware 2.0** renderer from the **Render View** window, the **Render Settings** window, the **Script Editor**, via the command line renderer, or by selecting **Render > Batch Render**.

Previewing your composite in the Render View

You can now easily create render pass nodes through the **Hypershade** and view the output of these passes directly in the **Render View**. Furthermore, you can create basic compositing graphs using render passes and standard Maya shading utility nodes, and visualize the result directly in the **Render View** or a batch render using the new render target node.

Vector displacement maps

Connect a vector displacement map to your shading group in Maya to create complex sculpted surfaces with displacement in arbitrary directions; for example, to create undercuts or overhanging features. You can create vector displacement maps in Mudbox or any comparable software.

You can use this feature with any Maya or mental ray shader; however, you cannot visualize vector displacement maps in the scene view, and you must render using mental ray for Maya.

Support for Ptex textures
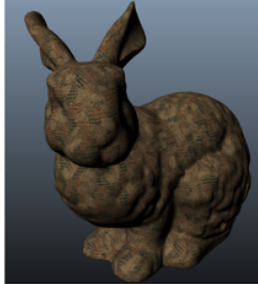
Model and assets provided by Ptex at http://ptex.us/samples.html

Maya 2012 provides you with the ability to preview Ptex textures assigned to any standard Maya shading network texture input in Viewport 2.0.

new mental ray Rendering book

All mental ray shading and rendering documentation has now been moved to the new mental ray Rendering book. mental ray specific nodes and attributes descriptions have been moved to the mental ray node attributes chapter.

mental ray attributes only accessible when mental ray plug-in is loaded

Previously, all mental ray attributes were available in the nodes' **Attribute Editor** regardless of whether the mental ray plug-in was loaded.

Beginning with Maya 2012, mental ray attributes are only accessible when the mental ray plug-in (`Mayatomr.mll`) is loaded.

mental ray for Maya users should ensure that the `Mayatomr.mll` plug-in is set to **Auto load** in the **Plug-in Manager**.

mental ray support for compressed .tif files

mental ray for Maya now supports input of LZW compressed .tif texture files.

EXR version 1.7 support

The EXR version 1.7 support of channel names of length 252 characters is available in Maya 2012. To utilize this option, create and set the MAYA_EXR_LONGNAME environment variable to 1. You must ensure, however, that any other applications you are using also support this standard.

What's New in API

Extension attributes

Beginning Maya 2012, you can use the new extension attributes feature to add attributes to a given node class so that they appear as static Maya attributes.

You can add or remove extension attributes via the API MDGModifier class. Alternatively, you can do so using the MEL/Python *addExtension* and *deleteExtension* commands.

New API Help features

The API Guide and API reference are now a separate part of the Maya help and can be found at *http://www.autodesk.com/maya-sdkdoc-2012-enu*. In addition, the API Help includes the following new features:

■ More links from the API Guide to API elements, for example, classes and functions.

■ Color coded syntax in example code in the API Guide.

■ API Reference included in table of contents.

■ Faster search.

New QT features

■ Qt now uses version 4.7.1.

■ Support for custom Qt widgets for use with Qt Designer.

■ For Windows and Linux users, Qt Designer is installed with Maya. For Mac OS X users, you can find Qt Designer directly at the *Qt Development Tools* website; or, you can build Qt from source. To find a version of the Qt source code that has been modified by Autodesk to include changes needed by the Maya UI, see *Customize the interface*.

What's New in MEL and Python

Please see the HTML version of this document for a list of added, deleted, and changed MEL/Python commands

What's New in Documentation

Maya Help on Autodesk.com

Starting this release the Maya Help is being published to the Autodesk.com website. By default, Maya 2012 calls the help from a web location to provide you with the latest documentation available. This shift to publishing directly to the web means we can provide regular updates and additions to content in an ongoing manner. This change also significantly reduces the footprint of locally installed data to your machine and makes the install and uninstall of Maya quicker.

A download version of the 2012 Maya Help will be available for those who prefer a local copy.

Maya Learning Channel on YouTube

A dedicated Autodesk Maya Learning Channel is now available on YouTube, providing trusted content authored by Autodesk. The channel streams videos on various workflows, features, and interoperability topics. New videos are posted regularly; subscribe to the channel to receive notification.

- *www.youtube.com/mayahowtos*

Online documentation archive

Several chapters of the Maya Help that have not been recently updated are now available in an online archive. To access the archive, see *http://www.autodesk.com/maya-docs-archive*.

API Guide and mental ray Manual new locations

The API Guide, Maya API reference, and mental ray Manual are now separate from the Maya help.

- API Guide and API reference: *http://www.autodesk.com/maya-sdkdoc-2012-enu*
- mental ray Manual: *http://www.autodesk.com/mentalray-help-2012-enu*

FBX documentation

As of this release, all FBX Help documentation is available from a website, rather than installed locally.

Click the **Help on FBX** button in the plug-in to access documentation online.

The Autodesk FBX Help option has been removed from the Autodesk Maya Help menu. You can now find FBX information included as a part of the Maya Help.

What's New - Previous versions

What's New - Previous versions

To view the *What's New* from previous versions of Autodesk Maya, see *http://www.autodesk.com/maya-whatsnewdocs*.