# X3D4 Asset Contributions

X3D 4.0 assets available to anyone
with special contributions for SIGGRAPH 2023
Los Angeles California

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# Web3D Consortium activities for X3D

X3D 4.0 Architecture, ISO/IEC 19775-1

- HTML5 and Web integration for X3D

- glTF 2.0 advanced lighting and rendering

- Spatialized W3C Web Audio API, MIDI 2.0

- Humanoid Animation (HAnim) 2.0

- Projective texture mapping (PTM)

Multiple related specifications in concert, file encodings and programming languages with equivalent expressive power

Relevant work possible for SC 24 groups, collaboration projects always welcome

Multiple working groups, 4000+ examples

Twitter and YouTube communication

ACM SIGGRAPH, 7-11 August 2023 LA USA

Web3D Conference, San Sebastian Spain, 9-11 October 2023, pursuing 28$^{th}$ year!

ACM Digital Library: Web3D Conference

Metaverse Standards Forum (MSF) work

- 3D Interoperability for Web exploratory group

# YouTube: Welcome to X3D Standard

# Twitter X

https://twitter.com/Web3Dconsortium
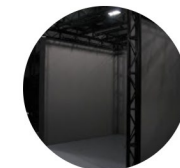
Cool demos and
useful announcements

Disclaimer: Twitter X does not

support Web3D Standards... yet

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Notifications

Messages

Lists

Bookmarks

Communities

Verified

**Profile**

More

**Post**

web|3D Web3D Consortium ...
@Web3DConsortium

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Edit profile

**Web3D Consortium**
@Web3DConsortium

Nonprofit organization for companies, agencies, universities, individuals. We build free+open ISO Web graphics standards: #X3D #VRML #HAnim #X3DOM @Web3D2023

Participation is world wide.    web3d.org    Joined September 2009

**3,826** Following     **2,060** Followers

Tweets          Replies          Highlights          Media          Likes

Pinned

web|3D **Web3D Consortium** @Web3DConsortium · Jun 12          ...
Welcome to Web3D Consortium! We develop #X3D and #HAnim @ISOstandards. We are an international, member-funded industry consortium committed to deployment of open, royalty-free 3D standards that enable interactive, real-time 3D on the Web.

youtube.com
Welcome to X3D Standard
The Web3D Consortium develops and maintains X3D ISO Standards. Web3D Consortium is an ...

# X3D Resources

https://www.web3d.org/x3d/content/examples/X3dResources.html



## X3D Resources

Extensible 3D (X3D) Graphics is the royalty-free open standard for publishing, viewing, printing and archiving interactive 3D models on the Web.

Applications | Authoring Tools | Authoring Support | Books | Conformance | Conversions | Examples | Export and Import | Feedback | License | Mobile | Model Search | PowerPoint | Programming Languages | Quality Assurance (QA) | References | Security | Showcase | Training and Tutorials | Videos | VRML and Open Inventor | Wish List | Savage Developers Guide | X3D-Edit | X3D Scene Authoring Hints | X3D Tooltips | X3D Validator | Contact

Numerous resources are available to support both X3D Graphics and its compatible predecessor, the Virtual Reality Modeling Language (VRML).

# X3D Tooltips

## Extensible 3D (X3D) 4.0 Tooltips

X3D Tooltips provide authoring hints for each node and field found in X3D Architecture Specification version 4 draft.

X3D Tooltips provide context-sensitive support for authors and are usable within tools (such as X3D-Edit). Each node's table entry also provides appropriate links to the X3D Abstract Specification, X3D Schema Documentation, X3D DOCTYPE Documentation, X3D JSON Documentation (draft), X3D Regular Expressions (regexes), and X3D Java SAI Library (X3DJSAIL).

AcousticProperties   Analyser   Anchor   Appearance   Arc2D   ArcClose2D   AudioClip   AudioDestination   Background   BallJoint   Billboard   BiquadFilter   BlendedVolumeStyle   BooleanFilter   BooleanSequencer   BooleanToggle   BooleanTrigger   BoundaryEnhancementVolumeStyle   BoundedPhysicsModel   Box   BufferAudioSource   CADAssembly   CADFace   CADLayer   CADPart   CartoonVolumeStyle   ChannelMerger   ChannelSelector   ChannelSplitter   Circle2D   ClipPlane   CollidableOffset   CollidableShape   Collision   CollisionCollection   CollisionSensor   CollisionSpace   Color   ColorChaser   ColorDamper   ColorInterpolator   ColorRGBA   component   ComposedCubeMapTexture   ComposedShader   ComposedTexture3D   ComposedVolumeStyle   Cone   ConeEmitter   connect   Contact   Contour2D   ContourPolyline2D   Convolver   Coordinate   CoordinateChaser   CoordinateDamper   CoordinateDouble   CoordinateInterpolator   CoordinateInterpolator2D   Cylinder   CylinderSensor   Delay   DirectionalLight   DISEntityManager   DISEntityTypeMapping   Disk2D   DoubleAxisHingeJoint

# X3DJSAIL, Java Scene Authoring Interface Library

https://www.web3d.org/specifications/java/X3DJSAIL.html

**X3D Java Scene Access Interface Library
(X3DJSAIL)**

X3D Java Scene Access Interface Library (X3DJSAIL) supports programmers with standards-based X3D Java interfaces and objects, all as open source.

Abstract | Codebase | CLASSPATH and Command Line | Configuration Properties | Conversions including Blender, MeshLab | Design Features | Downloads | Errors and Exceptions | Examples | EXI | Javadoc | License | Other Implementations | README | References | Specification Changes | TODO | Utility Methods | X3D Resources | X3D Scene Authoring Hints | X3D Tooltips | X3DUOM | Contact

## Abstract

X3DJSAIL, the X3D Java Scene Access Interface Library is a set of strongly typed Java application programming interfaces (APIs) providing programmer access to an X3D scene graph. Two integrated Java packages are included that contain X3D SAI interfaces and support the X3D Graphics Standards for Java programmers.

- `org.web3d.x3d.jsail` provides concrete implementation-oriented classes for building X3D scenes using standalone Java objects.
- `org.web3d.x3d.sai`   contains standard X3D SAI interfaces to independently compile Script-node source for use in X3D players.

Available products include Javadoc documentation, several thousand self-validating Examples, source code, compiled classes build support, run-time jar archives, and draft specification annexes for node interfaces and abstract-node type interfaces.

*Goal outcomes:* make it easy to create a fully valid X3D scene graph using Java, while also making it hard to create an incorrect or invalid X3D model.

# X3DPSAIL x3d.py package for Python

https://www.web3d.org/x3d/stylesheets/python/python.html

https://pypi.org/project/x3d

## Python X3D Package x3d.py

### X3D Python Scene Access Interface Library (X3DPSAIL)

Download and Installation | Design Features and Data Types | Development | Examples | Jupyter Notebook | PyPI for x3d.py | References | TODO | Contact

The x3d.py Python X3D Package supports programmers with Python interfaces and objects for standards-based X3D programming, all as open source. The presentation Python X3D Package Implementation provides an overview and shows examples.

"Pythonic is a word because Python programming is... different, in many excellent ways."

Search projects

# x3d 4.0.64.4

`pip install x3d` ⧉

✓ | <u>Latest version</u>

Released: Jan 29, 2023

Python package support for Extensible 3D (X3D) Graphics International Standard (IS)

**Manage project**

## Navigation

≡  Project description

⟲  Release history

⬇  Download files

## Project links

🏠  Homepage

## Project description

## Python package *x3d*

This project creates the <u>Python X3D Package</u> which is available for import via <u>PyPi</u>.

<u>Web3D Consortium</u> maintains this package under a BSD-style <u>open-source license</u>.

## Package installation (choose one)

- *pip install x3d*
- *python -m pip install x3d*

# X3D Ontology for Semantic Web

## https://www.web3d.org/x3d/content/semantics

### X3D Ontology for Semantic Web

The X3D Ontology for Semantic Web provides terms of reference for semantic query of X3D graphics models, including interactive 3D geometry, multimedia, and metadata.

Motivation | Download | Design and Design Patterns | OWLDoc | Queries | References | Tools | TODO | Contact

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## Motivation

Extensible 3D (X3D) Graphics is the royalty-free open standard for publishing, viewing, printing and archiving interactive 3D models on the Web.

The X3D Semantic Web Working Group mission is to publish models to the Web using X3D in order to best gain Web interoperability and enable intelligent 3D applications, feature-based 3D model querying, and reasoning over 3D scenes.

Motivating insights:

"The answer to your question is the response to the query." Jim Hendler and Dean Allemang

"Trying to use the Semantic Web without SPARQL is like trying to use a relational database without SQL." Tim Berners-Lee

"The proof of the pudding is in the eating." Wiktionary

# X3D Examples Scene Archives

https://www.web3d.org/x3d/content/examples/X3dResources.html#Examples

## 📝 Examples: Scene Archives for X3D

The X3D Examples Archives demonstrate how X3D nodes and scenes work. Thousands of scenes are provided in all X3D encodings. You can browse them individually online or download fully complete, separately installable .zip archives. Links to thousands of additional X3D example scenes are provided.

A simple example test scene is HelloWorld.x3d provided in a variety of X3D encodings: .x3d XML .x3dv ClassicVRML, .wrl VRML97, .html listing, .html X_ITE, .xhtml X3DOM, .java Java source, .json JavaScript Object Notation, .py Python source, .ttl Turtle source with SPARQL query, .x3db compression, XML canonicalization (C14N), and .png image.

| Quick Links | X3D for Web Authors | X3D for Advanced Modeling | Basic | Conformance Nist | Humanoid Animation (HAnim) | VRML 2 Sourcebook | Savage |
|---|---|---|---|---|---|---|---|
| Overview, references: | README | README | README | README | README | README | README |
| Archive examples: | Online | Online | Online | Online | Online | Online | Online |
| Local links (if present): | Local | Local | Local | Local | Local | Local | Local |
| Java conversions: | Javadoc | Javadoc | Javadoc | Javadoc | Javadoc | Javadoc | Javadoc |
| **4065** total X3D scenes: | 271 | 127 | 741 | 761 | 91 | 416 | 1253 |
| Catalog metadata XML: | Content catalog | Content catalog | Content catalog | Content catalog | Content catalog | Content catalog | Content catalog |
| Ant build scripts: | build.xml | build.xml | build.xml | build.xml | build.xml | build.xml | build.xml |
| Quality Assurance (QA) regression testing: | build.log.txt (history) | build.log.txt (history) | build.log.txt (history) | build.log.txt (history) | build.log.txt (history) | build.log.txt (history) | build.log.txt (history) |
| Full download: | zip (MD5 checksum) | .zip (MD5 checksum) | .zip (MD5 checksum) | .zip (MD5 checksum) | .zip (MD5 checksum) | .zip (MD5 checksum) | .zip (MD5 checksum) |
| Additional details: | see below | see below | see below | see below | see below | see below | see below |

# Learn: X3D for Web Authors

- https://x3dgraphics.com
- https://www.web3d.org/x3d/content/examples/X3dForWebAuthors/Chapter02GeometryPrimitives



*X3D Example Archives:* **X3D4WA, X3D for Web Authors, Chapter 02 Geometry Primitives**



Shape nodes can contain one geometry node and one Appearance node. Geometry primitives include the Box, Cone, Cylinder, Sphere and Text nodes. Each is placed individually inside a Shape node. Text nodes are further configured by FontStyle nodes.

The supporting Chapter 2 slideset and course videos (NPS, YouTube) for *X3D for Web Authors* are available online via X3dGraphics.com.

# What does each example page include?

*X3D Example Archives:* **X3D4WA, X3D for Web Authors, Chapter 02 Geometry Primitives, Geometry Primitive Nodes White Background**

Geometry Primitive Nodes: Shape, Box, Cone, Cylinder, Sphere, Text, FontStyle

hello X3D!

X3D model

ClassicVRML

VRML97

Canonical XML

html annotated documentation

.py python

X_ITE

X3DOM (editor)

.json (check)

.x3db Binary

.java source (Javadoc)

.ttl Turtle (query)

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE X3D PUBLIC "ISO//Web3D//DTD X3D 3.3//EN" "https://www.web3d.org/specifications/x3d-3.3.dtd">
<X3D profile='Immersive' version='3.3' xmlns:xsd='http://www.w3.org/2001/XMLSchema-instance' xsd:noNamespaceSchemaLocation ='
https://www.web3d.org/specifications/x3d-3.3.xsd '>
    <head>
        <meta name='title' content='GeometryPrimitiveNodesWhiteBackground.x3d'/>
        <meta name='description' content='Geometry Primitive Nodes: Shape, Box, Cone, Cylinder, Sphere, Text, FontStyle'/>
        <meta name='creator' content='Don Brutzman'/>
        <meta name='created' content='25 March 2005'/>
        <meta name='modified' content='8 July 2023'/>
        <meta name='Image' content='GeometryPrimitiveNodesWhiteBackground.png'/>
        <meta name='Image' content='GeometryPrimitiveNodesWhiteBackgroundReducedQuality.png'/>
        <meta name='hint' content='Default values have been added to geometry nodes for clarity, ordinarily default values are omitted following X3D
Canonicalization (C14N).'/>
```
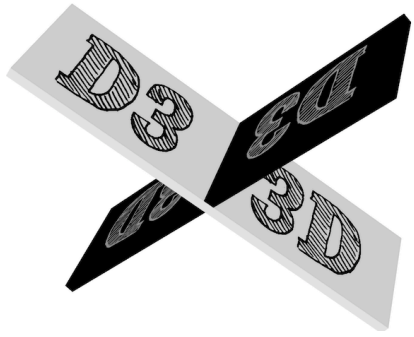
# d3-x3d
## 3D Data Driven Charting Library with D3 and X3D

Combining the power of the D3.js data-driven documents visualisation library and the Extensible 3D X3D 3D graphics standard, d3-x3d makes it simple to produce beautiful 3D data visualisations with minimal code.

**Observable:**

https://observablehq.com/collection/@jamesleesaunders/d3-x3d

**GitHub:**

https://github.com/jamesleesaunders/d3-x3d
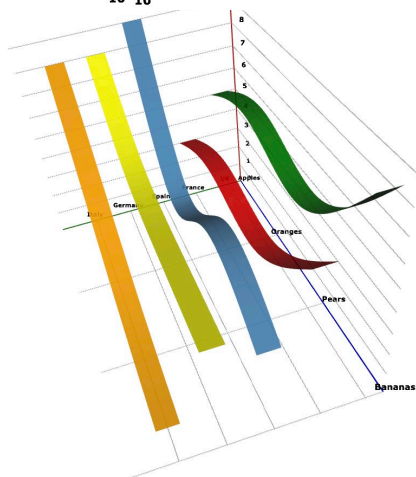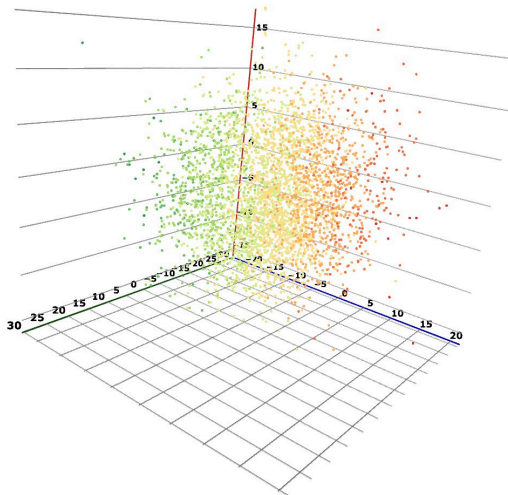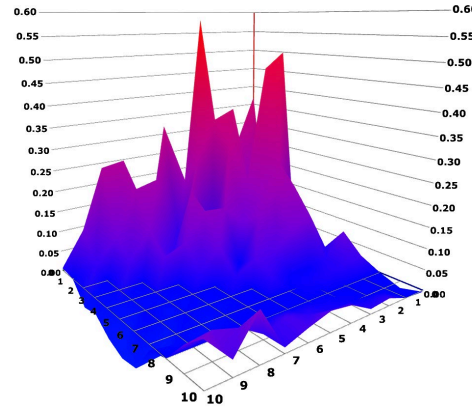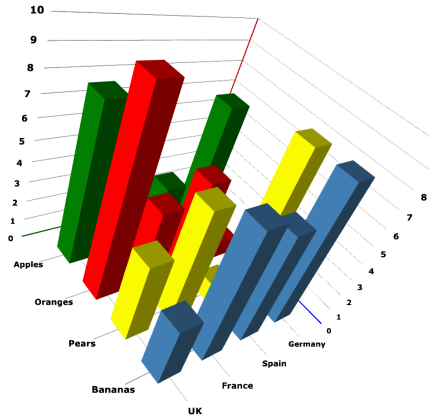
Works with x3dom and X_ITE x3dom libraries.
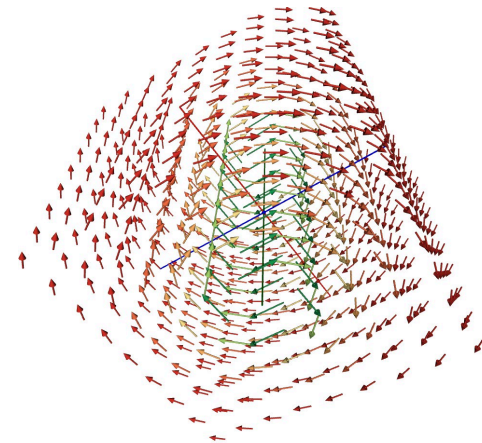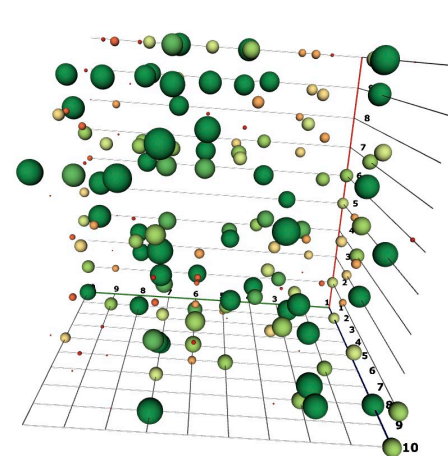
# Vince Marchetti:
# Drinking Goblets from Museum Collections

https://www.kshell.com/pages/webinar_20220531/drinking/goblets_inline_html.html

Demonstrates X3D scene construction from glTF assets collected from diverse sources.

# Vince Marchetti: Rocket 88

Demonstrates X3D scene with 3D models from glTF assets, video rendering from MP4, audio track from MP3 resources
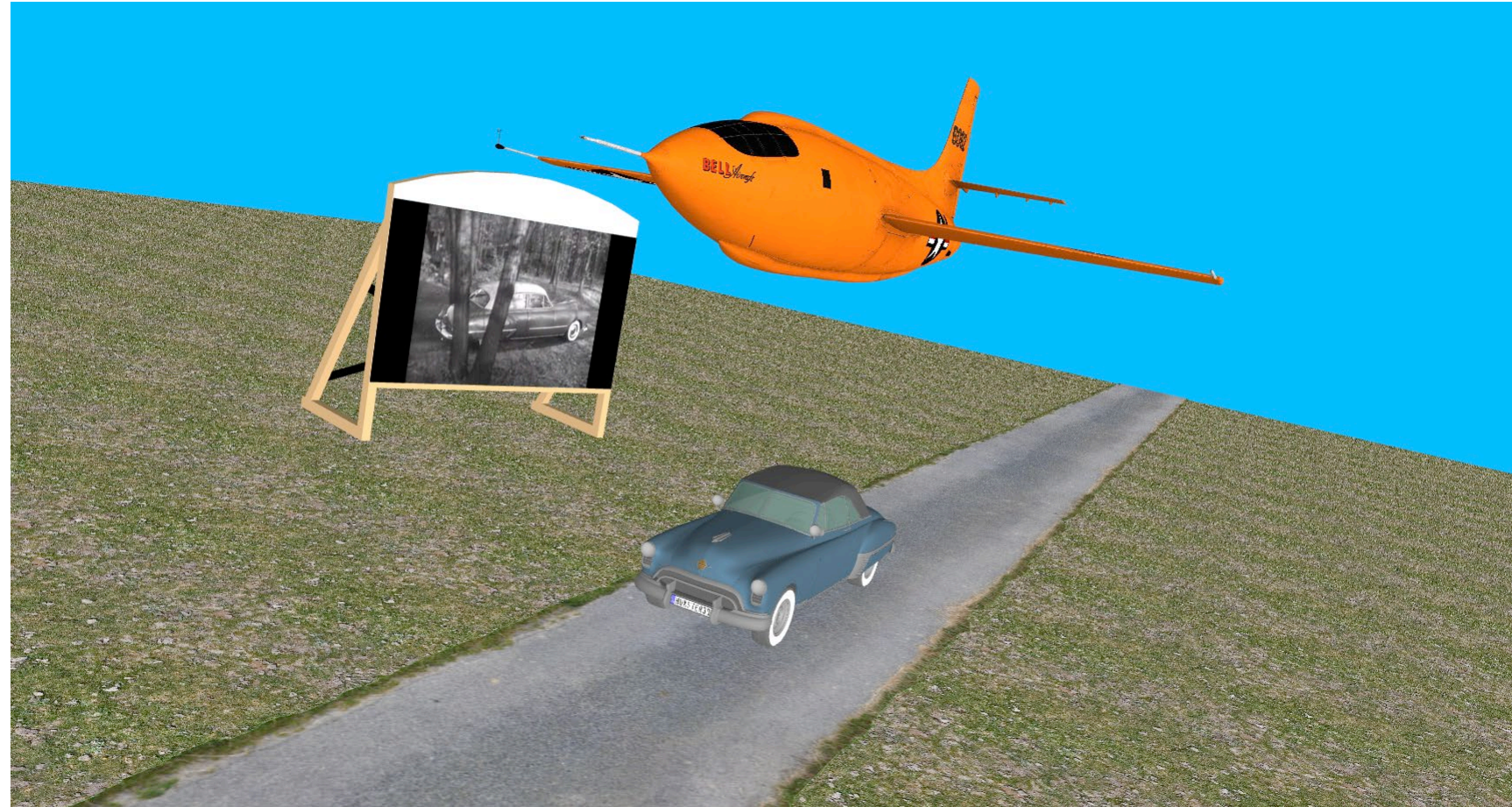
# X3DOM (pronounced "X-Freedom")

https://www.x3dom.org  with active developer list and new release
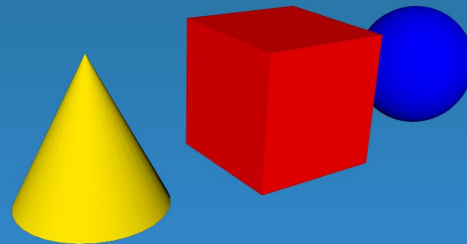
# Shapeways 3D printing model visualization, tooling

- Shapeways, a major, business oriented 3d printing service, uses X3D technology to offer customers a stable and convenient interface to visualize and prepare 3d models for successful printing

- https://www.shapeways.com

- https://www.shapeways.com/model/3dtools/13402637/0/6?key=8baedcf9f7331f6367486acc0d1c78f8
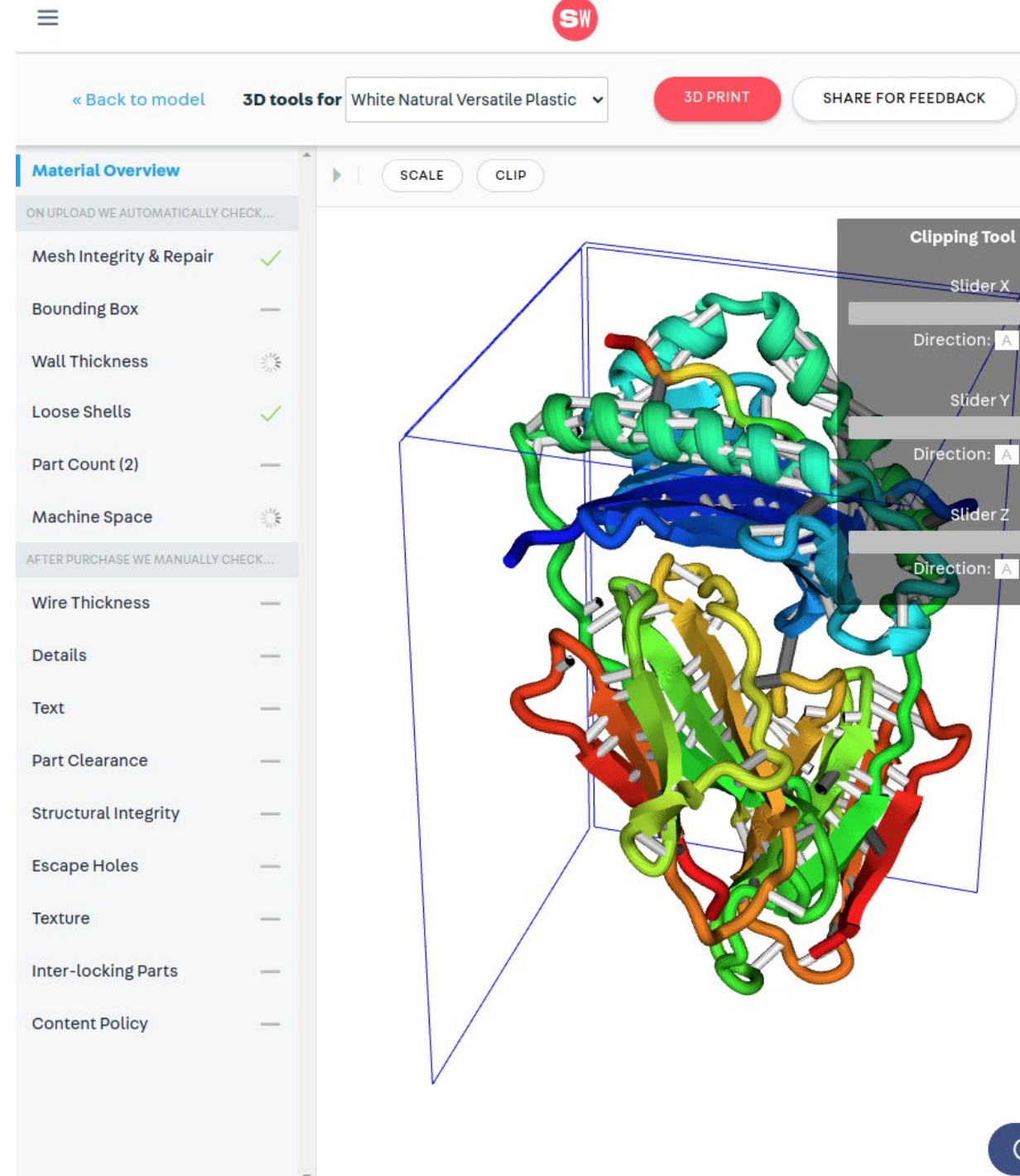
# X3DOM Editor – even advanced mathematics

andreasplesch.github.io    93

**X3DOM editor: Edit X3D code and click button to load:**   Update   **or copy to clipboard as link:**   Copy

Make sure to remove any initial white space. You can load external links with index.html? url=https://server/my.x3d . ⌨ K.E.Y.B.O.A.R.D

```
xsd:noNamespaceSchemaLocation='http://www.web3d.org/specifications/x3d
-3.0.xsd'>
6  <head>
7    <meta name='creator'
       content='Emilio Pisanty' />
8    <meta name='created'
9
10     content='Thu 26 Mar 2020 19:16:33' />
11   <meta name='title' content='imaginary-harmonic-cutoff-
     figureOc_alpha.x3d'/>
12   <meta name='description' content='3D Fig. 1c in Pisanty et al,
     2020'/>
13   <meta name='modifier' content='Andreas Plesch'/>
14   <meta name='modified' content='26 July 2023'/>
15   <meta name='reason' content='transparency'/>
```
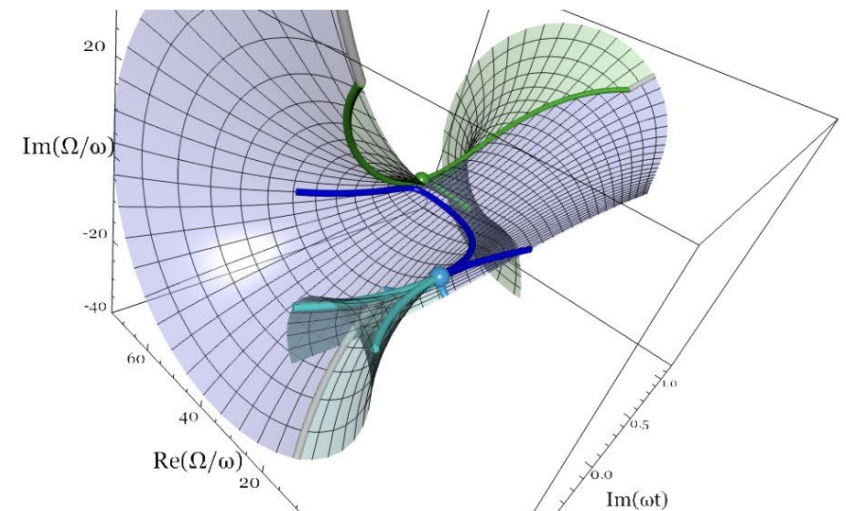
# X3DOM x-ray magnifying glass?

https://andreasplesch.github.io/Library/Viewer/index.html?url=https://gist.githubusercontent.com/andreasplesch/415d151abee114858c79c20c8c4b49e0/raw/201e73b4e11c1a77ee65690e5c98e03ac1b40d7e/BoxWithHoles183.x3d
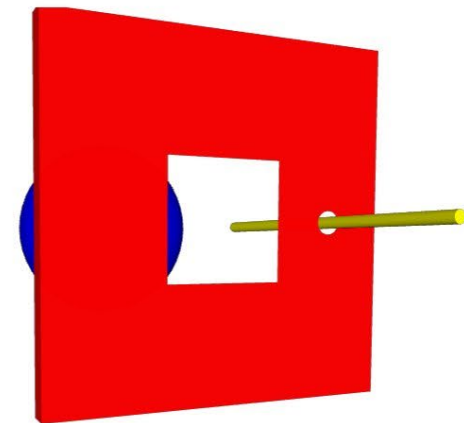
# X_ITE X3D Browser: Step Into The Future

Super active, https://create3000.github.io/x_ite

Also Titania editor (Linux) at https://github.com/create3000/titania/wiki
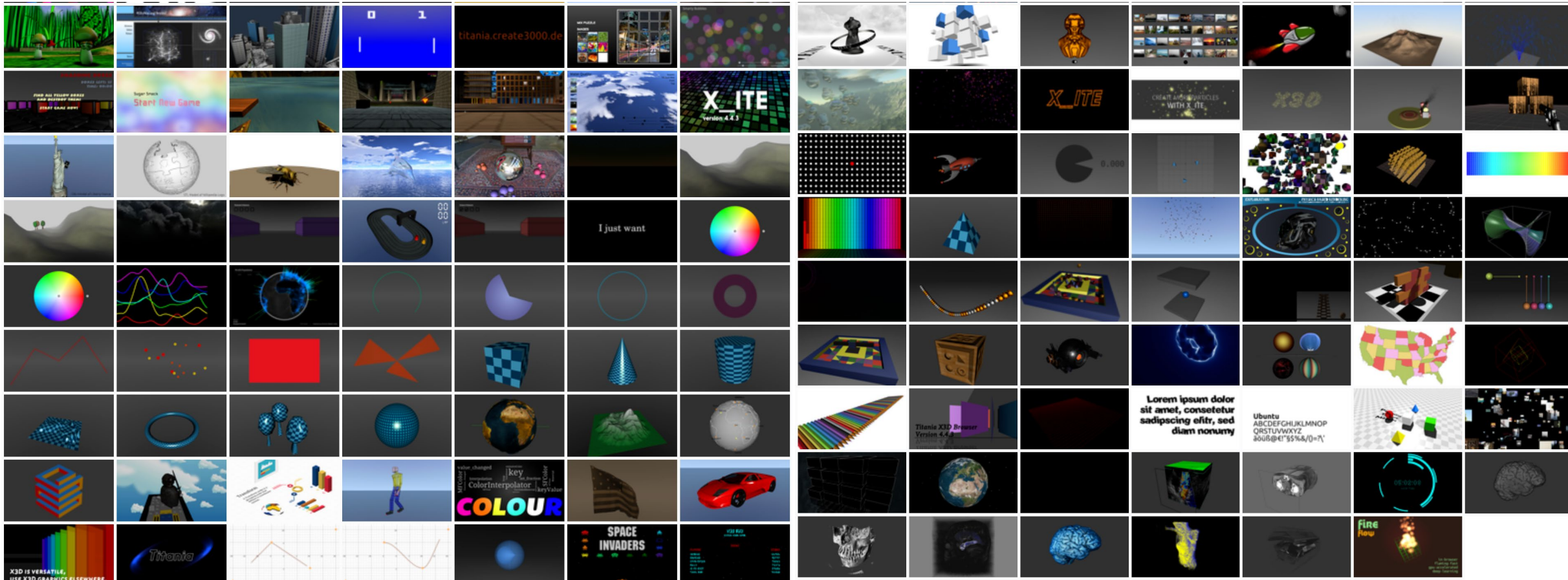
# Castle Game Engine view3dscene

Immense number of features, sustained growth
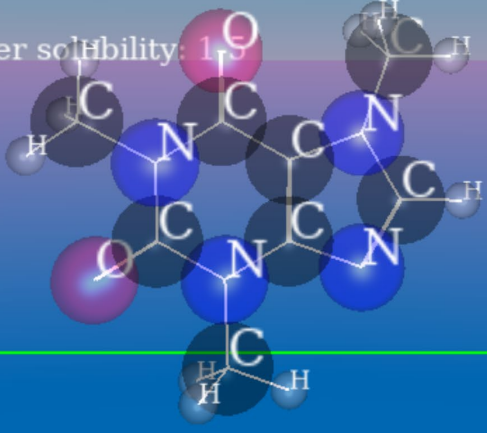
https://castle-engine.io/view3dscene.php

# FreeWrl https://freewrl.sourceforge.io

X3D/VRML
FreeWRL

**FreeWRL is an X3D/VRML open source viewer for Windows, Linux and OSX.**

FreeWRL has had a long track record, is here to stay. X3D Components get added, problems get resolved. Program with GLSL Shaders using the X3D Shaders Component, put your models exactly where you want them with the Geospatial Component, or just throw triangles to the screen as Extrusions, IndexedFaceSets, TriangleSets, Circle2D, Disk2D, Spheres, Boxes, Cubes; the list goes on and on.

With royalty free open standards, your models will continue to render, year after year.
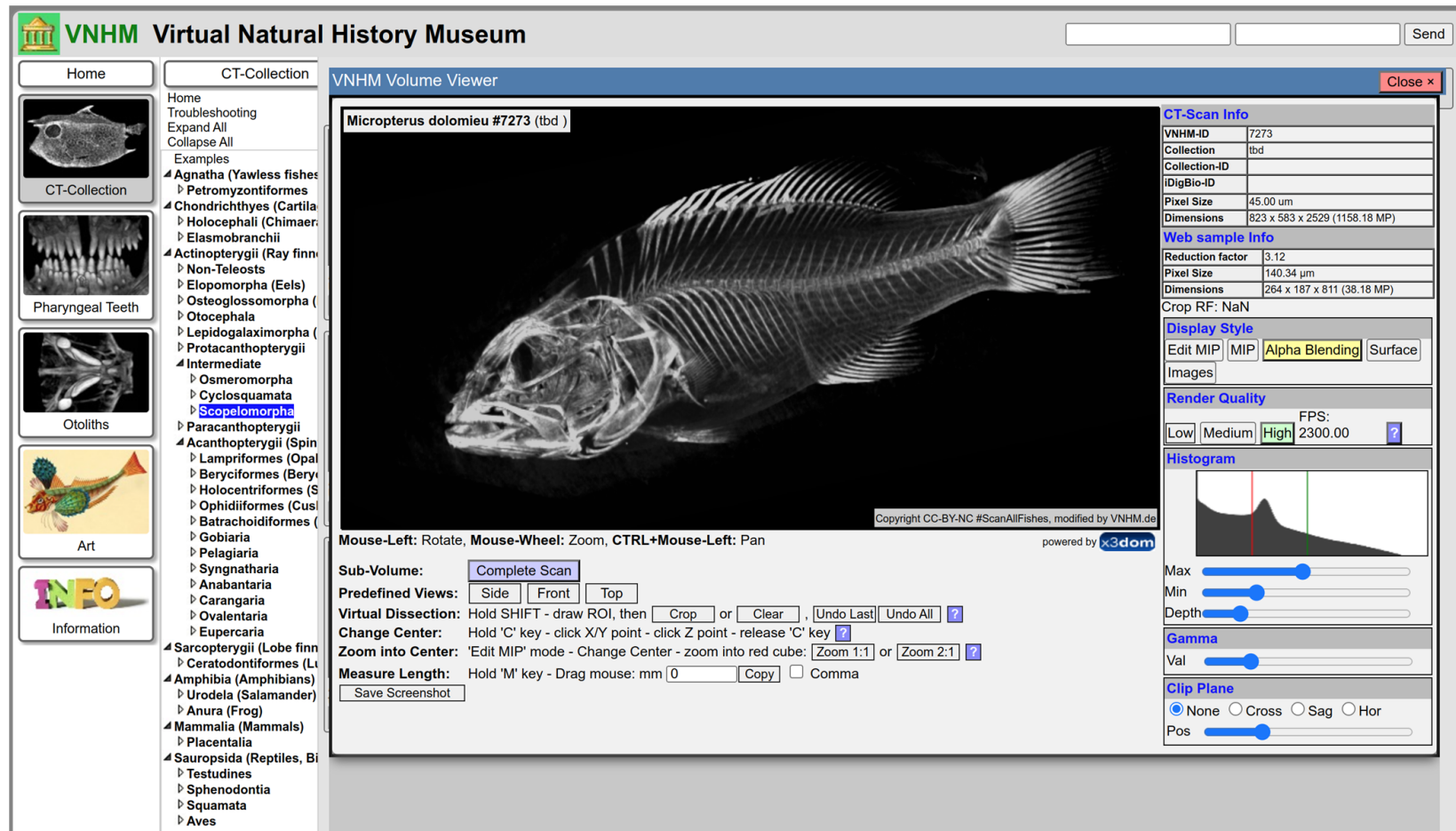
Your feedback is important to us. Contact information is available at the **Contact** page.
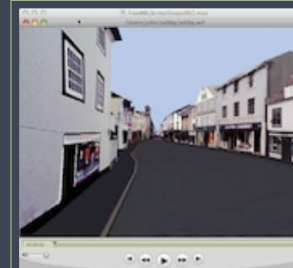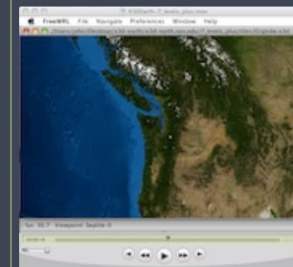
# CT collection of the Virtual Natural History Museum of the Department of Comparative Neuroanatomy at the University of Bonn, Germany

http://vnhm.de

More than 6000 tomographic scans of fish and other fauna (30TB) in full resolution, smoothly interactive, expert image and dissection analysis tools, powered by X3D

# X3D-Edit 4.0 Authoring Tool
# for Extensible 3D (X3D) Graphics

web|3D CONSORTIUM
Open Standards for
Real-Time 3D Communication

X3D-Edit is a free, open-source Extensible 3D (X3D) Graphics authoring tool for simple high-quality authoring, editing, import/export, validation and viewing of X3D scenes.



X3D-Edit 4.0

open-source X3D Graphics authoring

*New version available*! *2 August 2023*. X3D-Edit 4.0 is a trusted plugin available within *NetBeans* Integrated Developing Environment (IDE).

## https://savage.nps.edu/x3d-edit

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE X3D PUBLIC "ISO//Web3D//DTD X3D 3.3//EN" "https://www.web3d.org/specifications/x3d-3.3.dtd"
<X3D profile='Immersive' version='3.3' xmlns:xsd='http://www.w3.org/2001/XMLSchema-instance' xsd:noNa
    <head>
        <meta content='Caffeine.x3d' name='title'/>
        <meta content='Autogenerated version of Caffeine.x3d scene produced from Caffeine.xml Chemical Ma
        <meta content='Nicholas F. Polys' name='creator'/>
        <meta content='Don Brutzman' name='translator'/>
        <meta content='24 November 2005' name='created'/>
        <meta content='16 July 2023' name='translated'/>
        <meta content='16 July 2023' name='modified'/>
        <meta content='Caffeine.xml' name='reference'/>
        <meta content='CML sources https://www.xml-cml.org' name='reference'/>
        <meta content='JUMBO Chemical Format Conversion Tool' name='reference'/>
        <meta content='https://webbook.nist.gov/chemistry' name='reference'/>
        <meta content='Polys.StylesheetTransformationsInteractiveVisualization.Web3d2003Symposium.pdf' na
        <meta content='Originally Published in Proceedings of Web3D 2003, ACM Press' name='reference'/>
        <meta content='CmlToX3d.xslt' name='generator'/>
        <meta content='https://www.web3d.org/x3d/content/examples/Basic/ChemicalMarkupLanguage/Caffeine.x
        <meta content='../license.html' name='license'/>
    </head>
    <Scene>
        <ProtoDeclare name='Carbon'>
            <ProtoInterface>
                <field accessType='inputOutput' name='position' type='SFVec3f' value='0 0 0'/>
                <field accessType='inputOutput' name='materialTransparency' type='SFFloat' value='.6'/>
            </ProtoInterface>
            <ProtoBody>
```

# X3D-Edit

| | |
|---|---|
| GroupId: | **org.web3d.x3d.tools** |
| ArtifactId: | **x3dedit** |
| Author: | **Don Brutzman** |
| | **Terry Norbraten** |
| License: | **license.txt** |
| Homepage: | **https://github.com/Web3DConsortium/X3D-Edit/** |

✱ 2023-05-06    ✎ 2023-08-03    ⬇ 3,039

**Editing**   **Modeling**



## Download matrix

| Plugin version | NetBeans compatible | | |
|---|---|---|---|
| 4.0.27 | ⬇ NB 17   ⬇ NB 16 | | **June 2023** |
| 4.0.28 | ⬇ NB 17 | | |
| 4.0.29 | ⬇ NB 18 - Verified   ⬇ NB 17 - Verified | | |
| 4.0.30 | ⬇ NB 19 - Verification pending   ⬇ NB 18   ⬇ NB 17 | | |

**August 2023**

## Intro

X3D-Edit supports creation, authoring, validation and viewing of X3D graphics model files
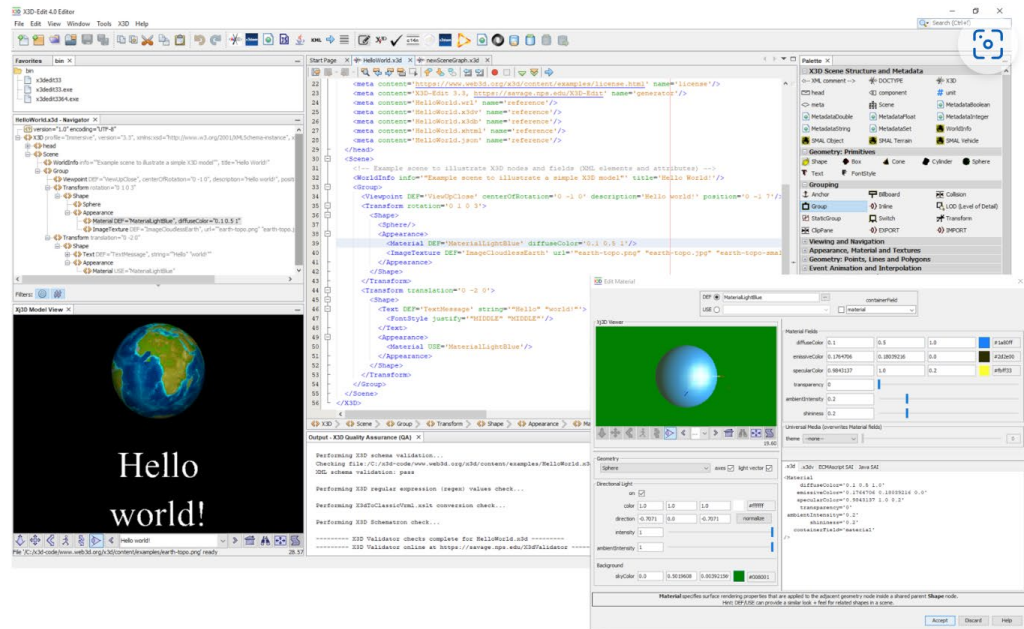
# Alex Lobert
# 3D VR in VRML
## *restored*

https://vr.alexllobet.com

About 22 years ago Mr Llobet started developing VRML scenes on a non-professional basis, he developed models based on the movie 2001, as well as the World Trade Center in New York.  He wanted to distribute these on the Web, but as we know the technology of plugins for web content didn't achieve orbit, and Mr Llobet's enthusiasm waned.  He very recently discovered X_ITE and was happy that his VRML models still work, and can now be distributed as he wished, just by the user clicking a link.

A testament to the stability of a platform - independent standard.

# 3D VR Virtual Reality Models using VRML

Here are examples of what can be done in 3D VR Virtual Reality on the web using VRML. With these interactive 3D models created in VRML you can walk around or inside the original New York World Trade Center Twin Towers or you can float in space and view the space ships from the movie "2001: A Space Odyssey." View and navigate these scenes just like a video game.
To navigate in these worlds you don't need any plugin or special browser.

Just click on the images below and enjoy!
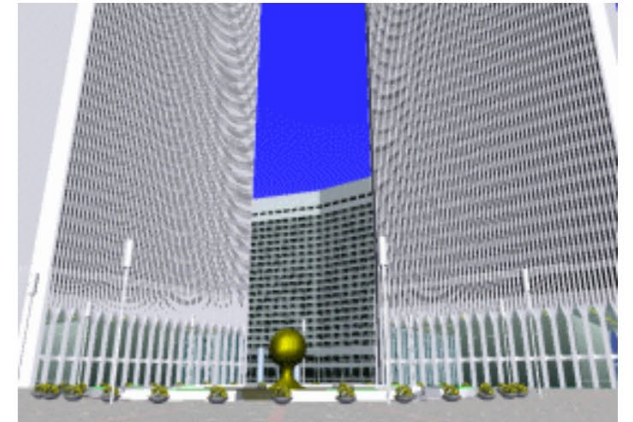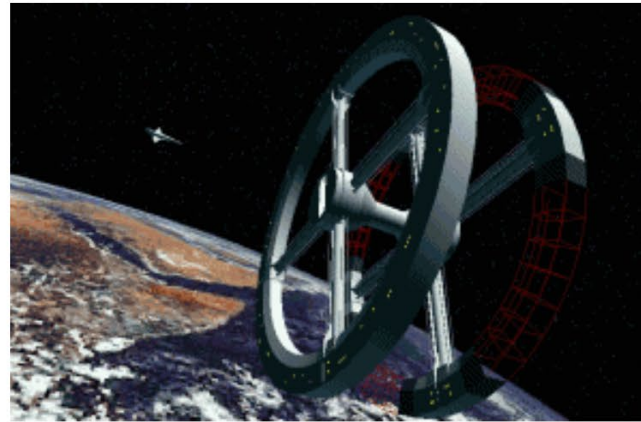




2001: A Space Odyssey in Virtual Reality    Tribute to the World Trade Center in 3D

# Get involved!

X3D Working Group and X3D Community

- x3d-public@web3D.org
- https://www.web3d.org/community/public-mailing-lists

… and tons more activities online at web3D.org

Very friendly and supportive, learning by doing.  We work by consensus and welcome anyone who wants to help us keep growing the 3D Web.

Have fun with X3D!  ☺