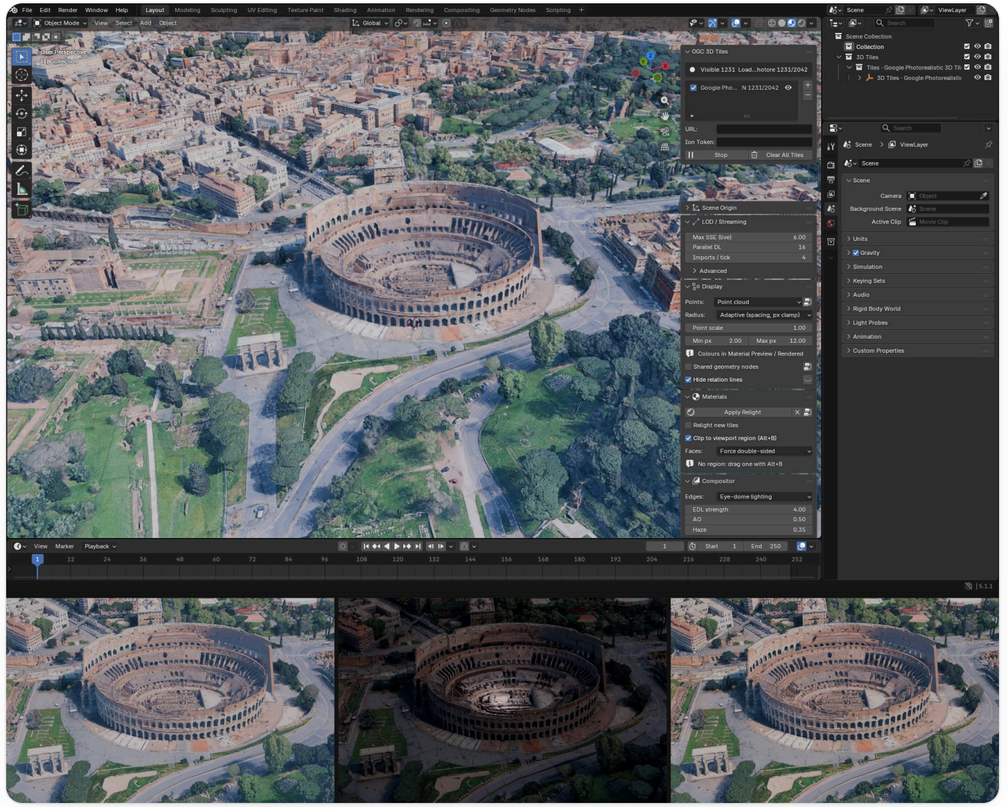
Blender extension · cesium-native inside

3D Tiles, streamed into Blender

Meshes, point clouds, Gaussian splats and voxels load around the camera, the way Cesium does it, and render in EEVEE and Cycles.



Why

Two crowds, one missing bridge

Blender users

City models, drone photogrammetry and LiDAR surveys are far larger than a .blend can hold. Importing one tile at a time means choosing a level of detail by hand, for every shot.

The 3D Tiles and Cesium crowd

Tilesets stream in CesiumJS, Unreal and Unity. Path-traced stills, node-based shading, compositing and animation tools were out of reach without exporting.

The bridge a Blender extension that streams a tileset.json as Blender objects, level of detail included.

Same engine cesium-native selects, loads and decodes the tiles, as in Cesium for Unreal and Unity.

Open source MIT, on GitHub, with a pure Python backend when the native wheel is not installed.

How it works

The viewport is the camera cesium-native follows

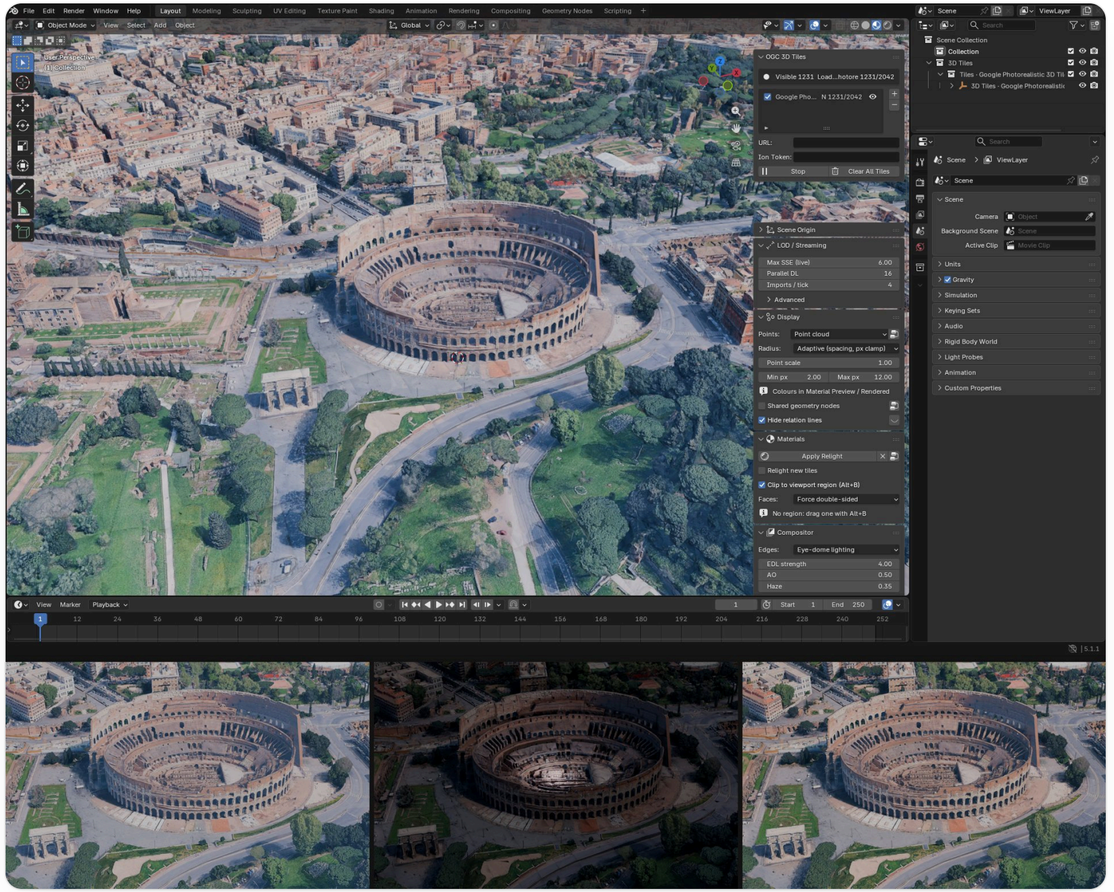
Every tick the add-on hands the viewport (or the render camera) to cesium-native as a view state.

Selection screen-space error, frustum culling, REPLACE and ADD refinement, load priorities.

Loading tiles are decoded off the main thread and built as meshes from numpy arrays.

Unloading tiles out of view are hidden, then freed; a disk cache keeps the downloads.

Georeference a scene origin on the globe; ECEF becomes local east, north, up in metres.



Google Photorealistic 3D Tiles over the Colosseum, streamed in the viewport

What streams

The flavours of 3D Tiles cesium-native reads

Meshes

b3dm and glb, with Draco, meshopt and KTX2. 3D Tiles 1.0 and 1.1, implicit tiling included.

Point clouds

pnts and glTF points, with their colours, intensity and classification.

Gaussian splats

KHR_gaussian_splatting, SPZ or uncompressed, as native Blender 5.3 splats.

Voxels

box and region voxel tiles, as blocks or as OpenVDB volumes.

Sources any tileset.json URL, local and network files, Cesium ion assets, Google Photorealistic 3D Tiles.

Also a bare WGS84 globe to drape imagery on, and quantized-mesh terrain.

In Blender

One sidebar tab: add a URL, press Start

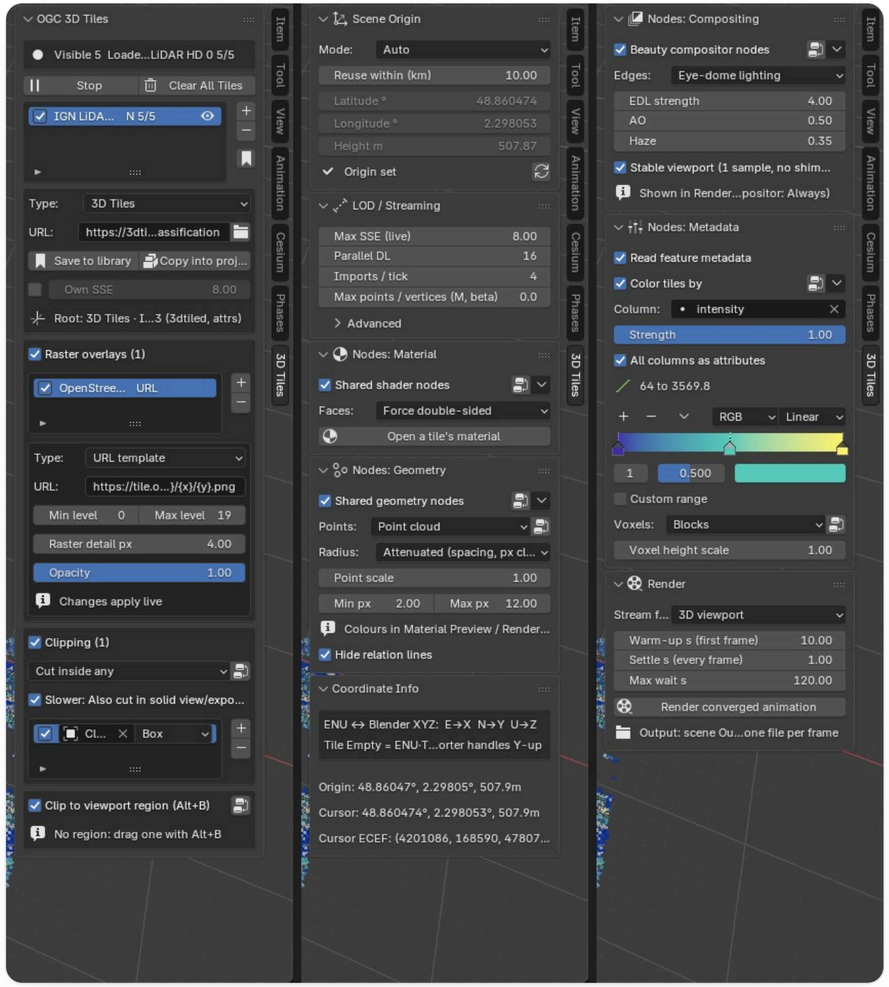
Tilesets a list of entries, each with its overlays and its clipping; several stream at once.

Scene origin automatic, typed in, or found by searching a place name.

LOD / Streaming maximum screen-space error, parallel downloads, imports per tick.

Nodes material, geometry, compositing and metadata, each one shared by every tile.

Render wait for the tiles of each frame before rendering it.



Raster overlays

Imagery draped on any tileset, as in Cesium

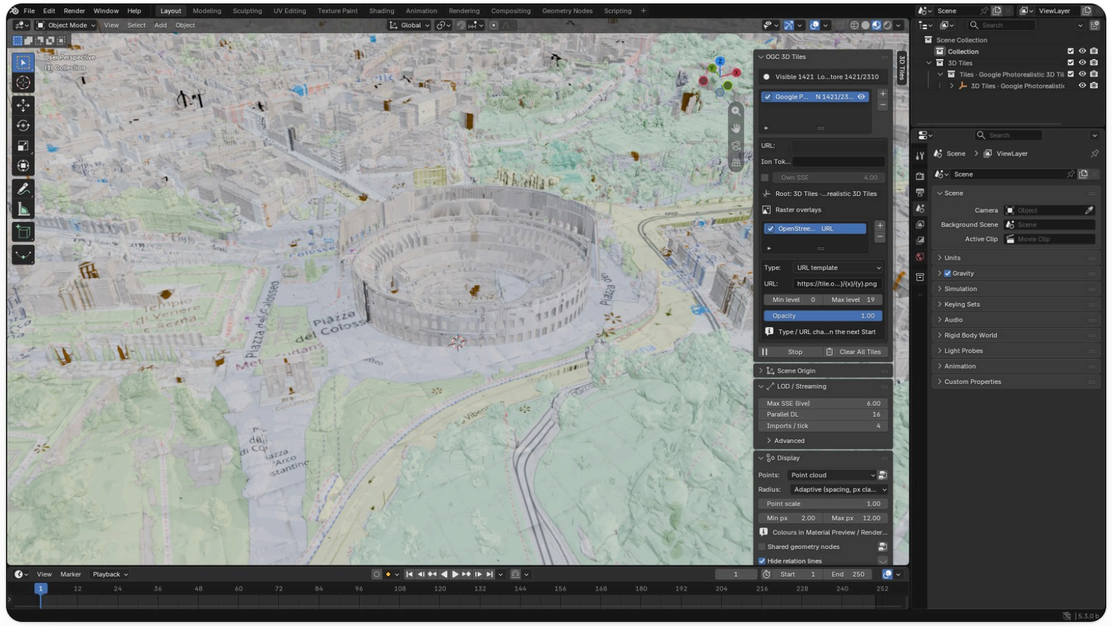
Sources URL templates, TMS, WMTS, WMS, Cesium ion, Bing Maps, Google Map Tiles.

Presets OpenStreetMap, Esri World Imagery and IGN orthophotos need no key.

Projection cesium-native computes the texture coordinates per tile, in the overlay's own tiling scheme.

Live tick an overlay or change its opacity while streaming. Several stack in order.

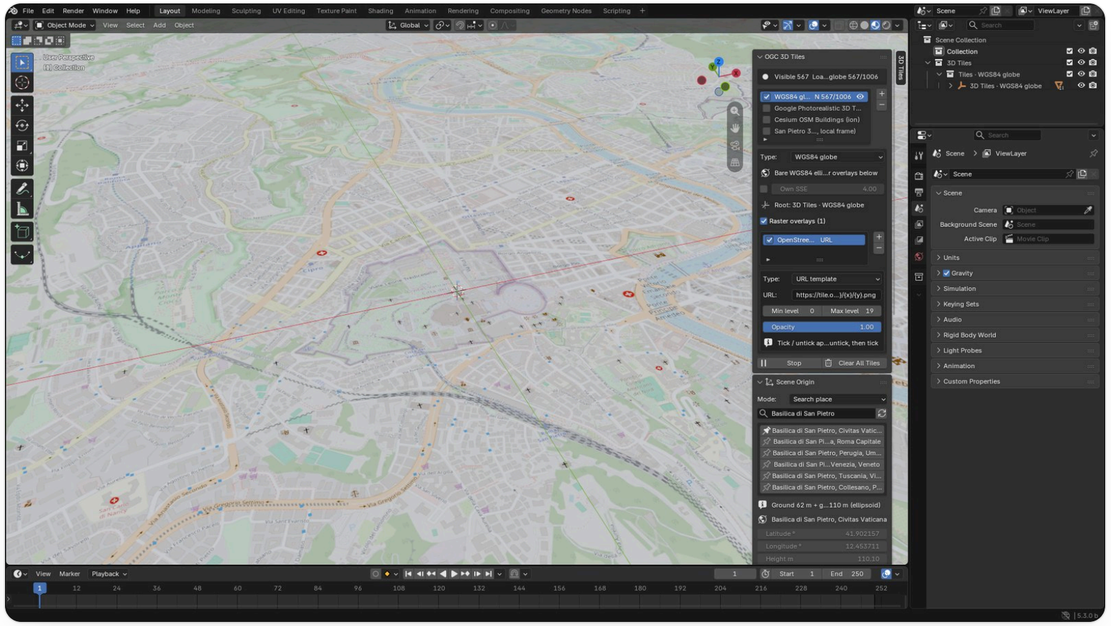
Point clouds too each point takes the colour of the map under it.



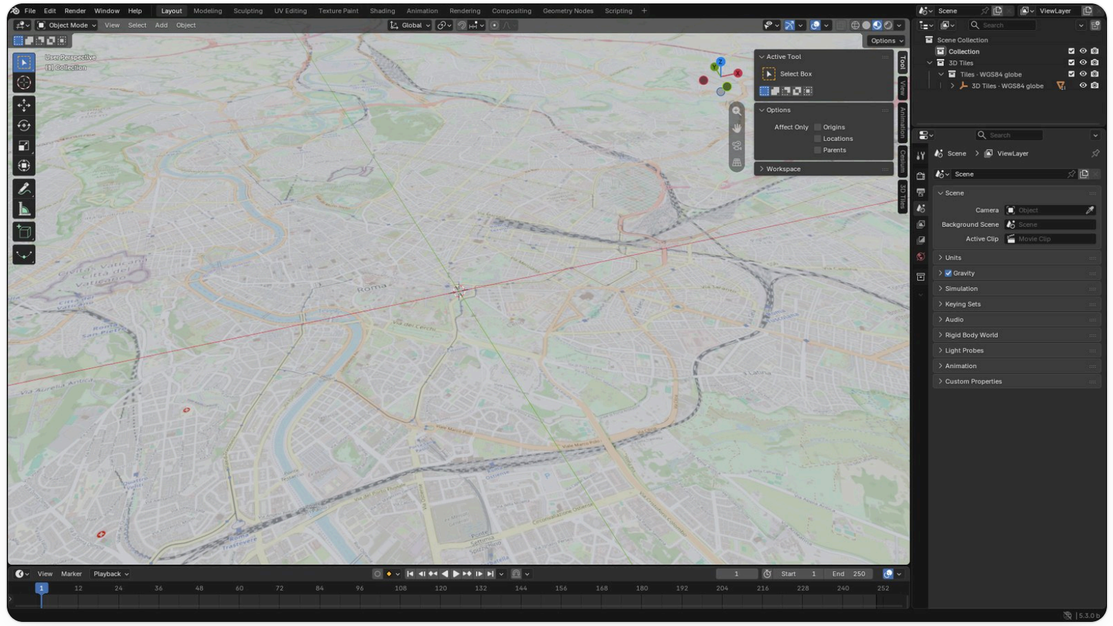
OpenStreetMap draped on Google Photorealistic 3D Tiles over the Colosseum

Georeference

The scene origin sits on the globe



Search place: the origin on the ground at the place found, terrain and geoid heights included



A WGS84 globe entry with an OpenStreetMap overlay, over Rome

Several tilesets share one origin, so a drone scan lands inside the city model around it.

Metres, Z up Blender units stay metres; coordinates near the origin stay small and precise.

Clipping

Cut a tileset with Blender objects

Clip-polygons the outline of a mesh or curve seen from above, as Cesium's clipping polygons.

Boxes an object's bounding box, to cut in 3D: the top floors of a building, a slab of a point cloud.

Viewport region Blender's Alt+B region, honoured in Material Preview and Rendered too.

Live move or keyframe the object and the cut follows, on meshes, points and splats.

Why drop a high-resolution scan into a coarser city model without the two overlapping.

Tiles fully outside

are never downloaded: cesium-native excludes them during selection.

Tiles on the edge

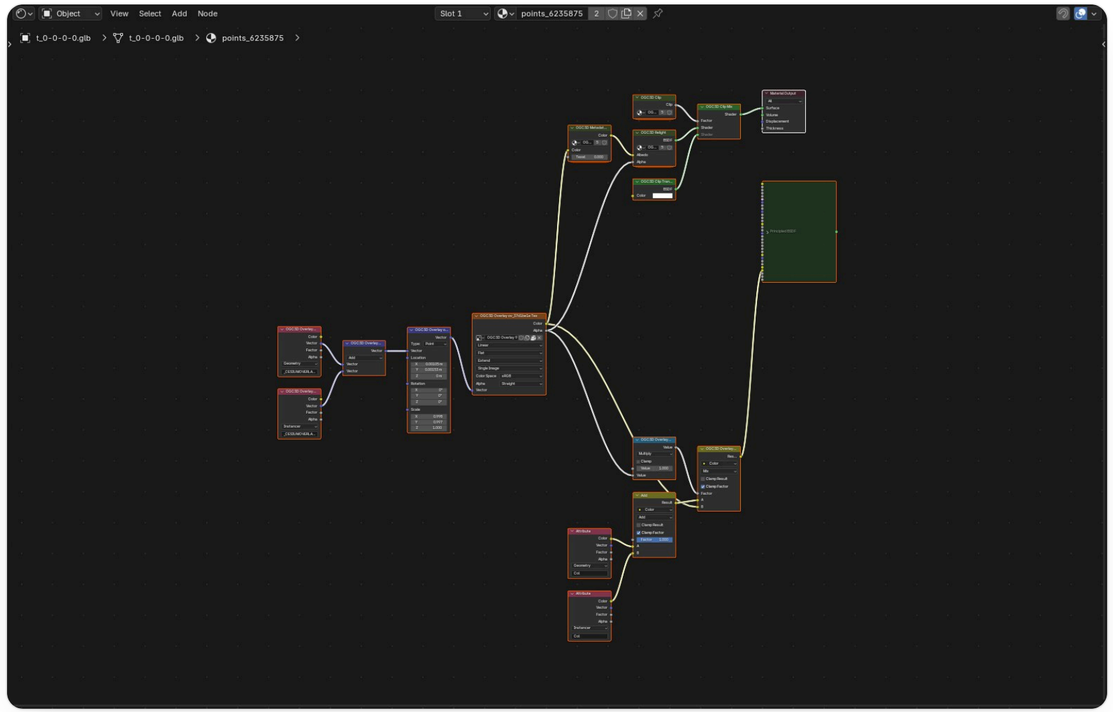
are cut in the shader, and optionally in the geometry for Solid view and exports.

Upstream

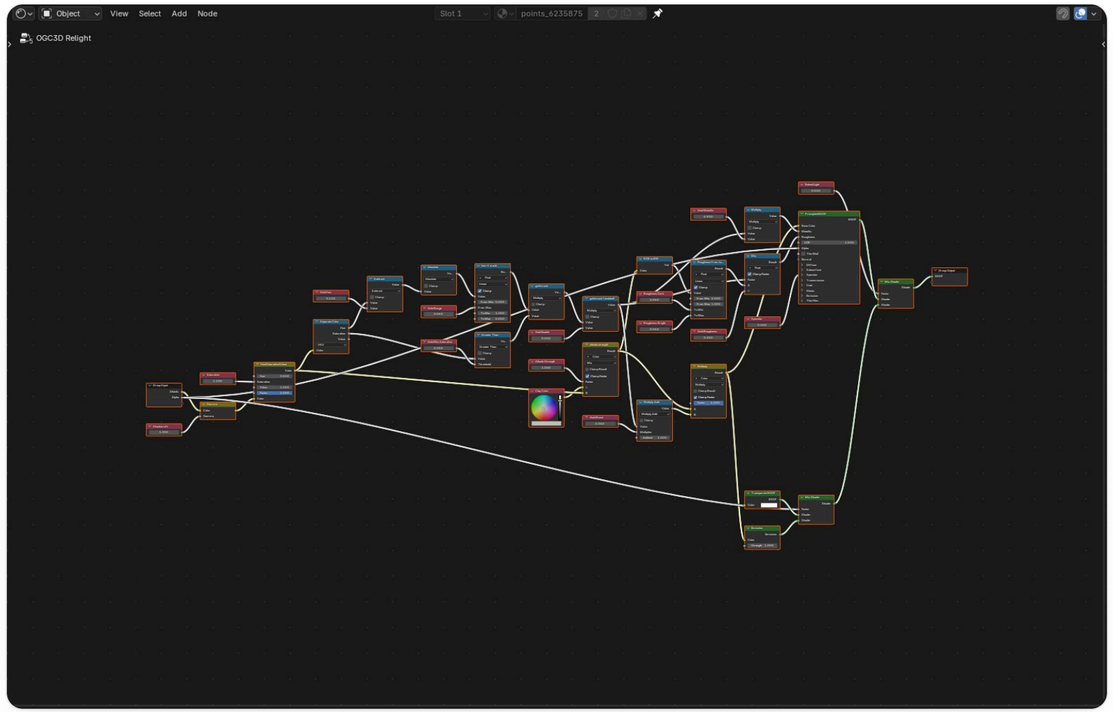
geometry-level clipping in cesium-native is requested in issue 1486.

One graph for all tiles

Edit one node group, every tile follows



A tile's own material: its texture, then the shared groups in a row

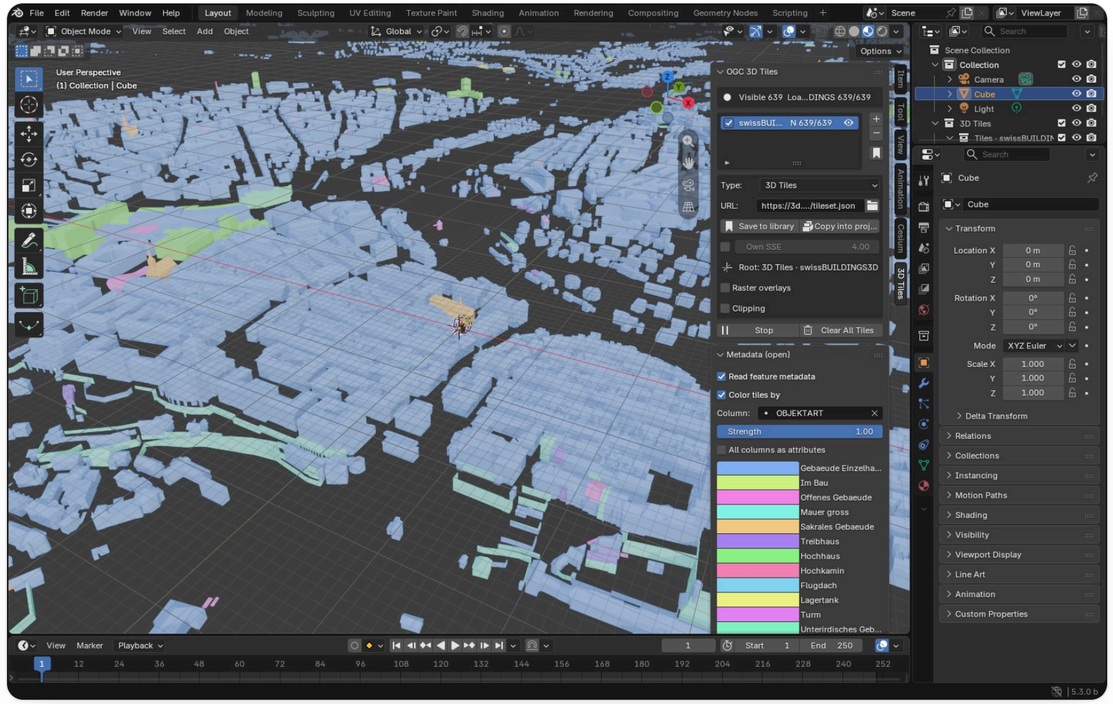


OGC3D Relight, the shared shader group: albedo, baked light, roughness, X-ray

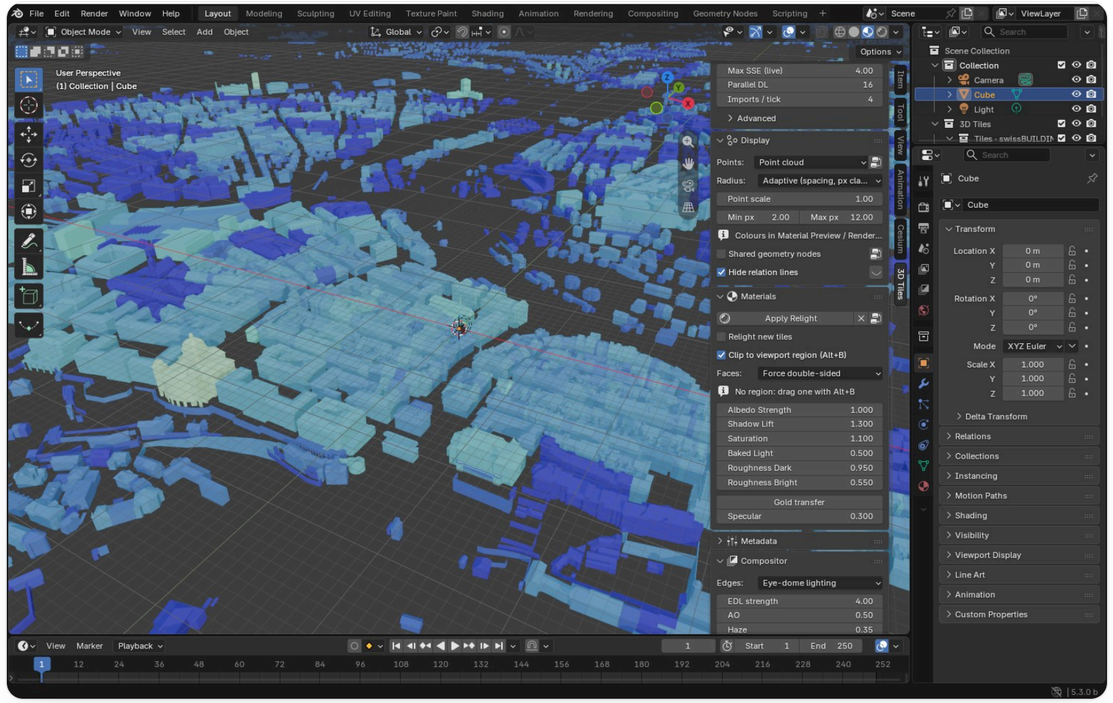
Shader, geometry, compositor three shared graphs, applied to tiles already loaded and to those that stream in later.

Feature metadata

Colour by class or by number



swissBUILDINGS3D over Bern by building type, one editable colour per class



The same tiles by building height, through a colour ramp

Read from feature tables, per-point attributes, property textures and tileset metadata.

LiDAR classification gets the LAS names and colours; each class has an opacity, to hide the ground.

Gaussian splats

Splat tilesets as native Blender 5.3 splats

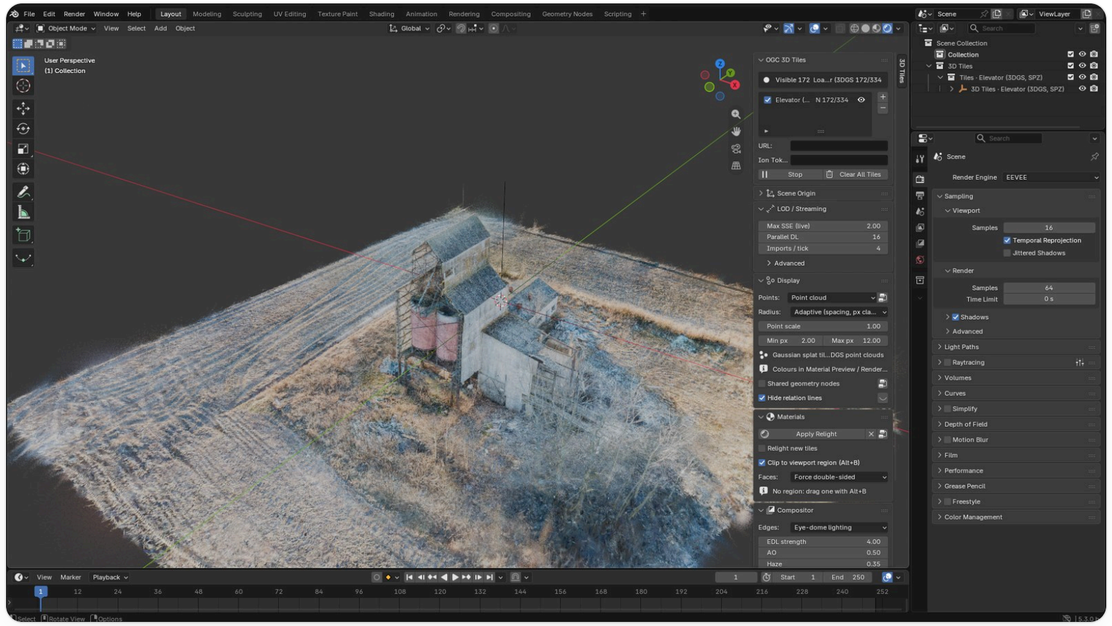
Format KHR_gaussian_splatting in glTF tiles, SPZ compressed or plain accessors.

Level of detail the tileset's own hierarchy: coarse splats far away, fine ones up close.

Render EEVEE viewport and Cycles, next to meshes and point clouds.

Clipping the same polygons and boxes cut splats.

Before 5.3 splat tiles show as points.



A splat tileset in Blender 5.3, Rendered viewport

Animations

Each frame waits for its tiles

The problem Blender cannot pause inside a render: streaming stops while a frame renders.

Stream for the camera tiles are selected for the scene camera, at the render resolution.

Render converged animation steps through the frame range and renders each frame itself.

Settle a frame renders once the queue is empty and nothing has changed for a moment.

Output one file per frame in the scene's output path, as Render Animation does.

Warm-up

the first frame waits longer: empty scene, cold cache.

Max wait

a ceiling per frame, so a slow tile never stalls the whole render.

Finer than the viewport

lower Max SSE before rendering for more detail than you navigate with.

Rendering

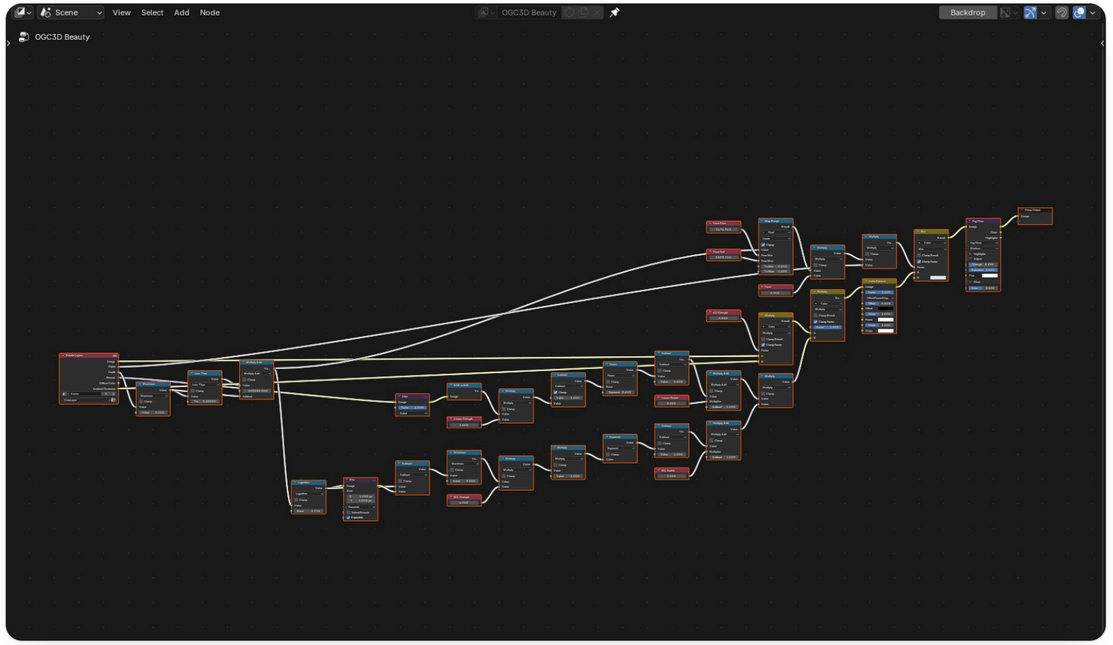
EEVEE and Cycles, with the look you choose

Beauty compositor eye-dome lighting, normal creases, ambient occlusion, haze, a grade.

Relight photogrammetry carries its own light: mix it with real lamps, or go clay.

Orthographic plans and elevations select the same tiles as a perspective view of that frame.

X-ray and clay fade the faces turned to the viewer, or drop the photo for a clay colour.



OGC3D Beauty, the compositor tree built by the add-on

For the 3D Tiles crowd

What sits between cesium-native and Blender

cesium-native-python	the bindings by Caleb Buffa. The add-on installs a wheel built for Blender's own Python, no compiler needed.
IPrepareRendererResources	implemented in Python: glTF models become numpy arrays in the load thread, Blender meshes in the main thread.
Tile excluders	clipping polygons and boxes exclude whole tiles before they are downloaded.
Raster overlays	cesium-native's own, with the overlay texture coordinates read back into Blender materials.
Caching	cesium-native's sqlite HTTP cache, shared between tilesets, with a size cap.
Fallback	a pure Python traversal with the same selection rules, when the wheel is absent.
Wheels	Linux x86_64, Windows x64 and macOS arm64, CPython 3.11 to 3.13, built by GitHub Actions.

Paste a tileset URL.
Press Start.

01 github.com/iconem/blender_ogc3dtiles · the extension zip is on the Releases page

02 iconem.github.io/blender_ogc3dtiles · the documentation

03 Blender 4.2 or newer · splats need 5.3

04 MIT licence · issues and pull requests welcome