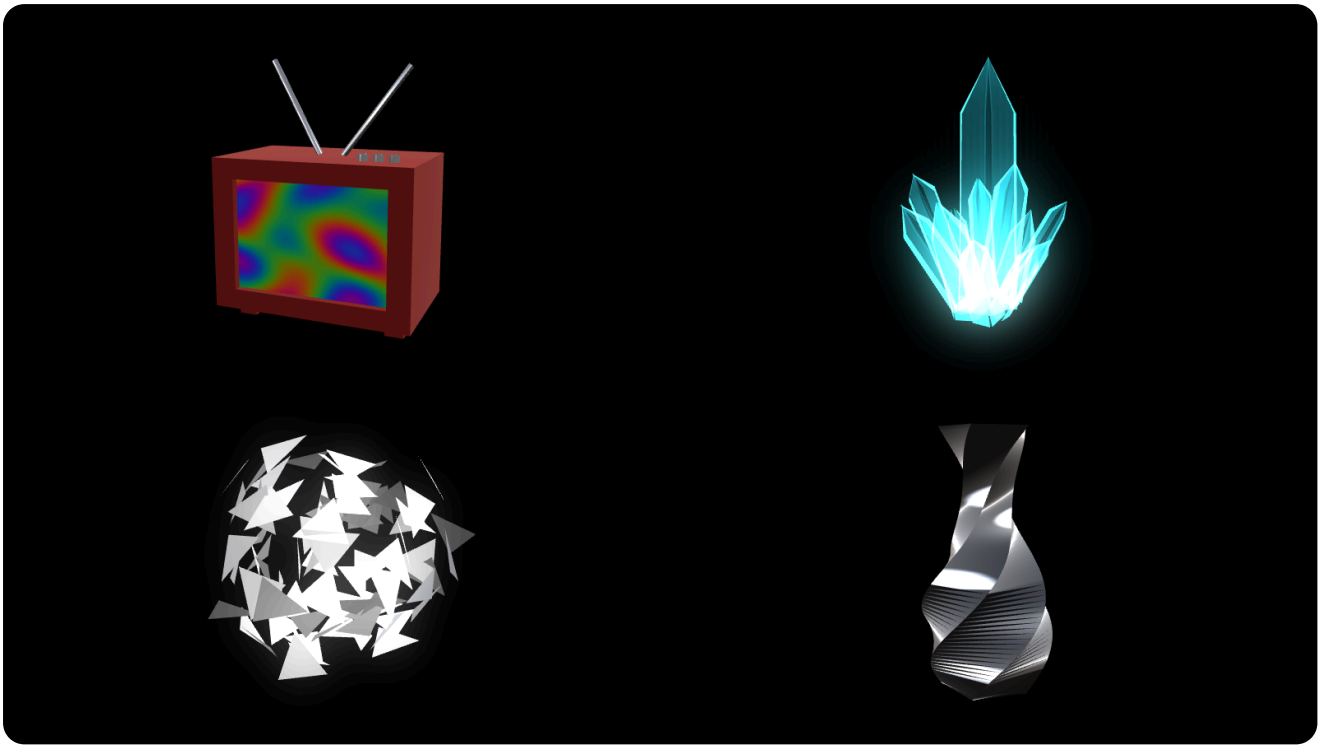
Meshmerize — User Guide



Real 3D models, live in Resolume. Meshmerize loads glTF / GLB, OBJ, STL and PLY files natively on macOS and lets you spin, explode, shatter, wireframe, chrome-plate and audio-drive them — or, with **Meshmerize FX**, wrap your layer's video around them.

Version 1.0 · macOS 12+ · Apple Silicon and Intel · Resolume Arena / Avenue 7.11 or newer

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What's in the box

Plugin	Type	Use it for
Meshmerize	Source	A 3D model on its own clip, on a transparent (or black) background. Composite it over anything.
Meshmerize FX	Effect	A 3D model on top of a clip's video — with that video mapped onto the model's surfaces.

Both have the same controls. The FX adds video-mapping options.

Also included: a **Demo Models** folder (a video-ready retro TV, a crystal cluster, a twisted tower STL and a point-cloud galaxy), all free to use in your shows.

Install

1. Quit Resolume (recommended, though recent versions pick up new plugins while running).

2. Copy **Meshmerize.bundle** and **Meshmerize FX.bundle** into `~/Documents/Resolume Arena/Extra Effects/` (or `Resolume Avenue/Extra Effects/`).
3. Start Resolume. Meshmerize appears under **Sources**, Meshmerize FX under **Effects**.

Disk space: about 55 MB installed (have 150 MB free while installing). The built-in model library lives inside Meshmerize.bundle and Meshmerize FX uses it from there, so keep the two bundles in the same folder.

License and trial

Without a license Meshmerize is a **7-day free trial**: the full plugin with a **Meshmerize Trial** watermark over the output, and a line along the bottom counting down the days left. The trial starts the first time Meshmerize runs on a Mac. After 7 days the picture fades to a glimmer under **TRIAL ENDED** until a key is entered (a license brings it straight back, settings and all). To unlock it:

1. Find your license key on the Creem order page or in the receipt email.
2. In Resolume, open the **License** section at the bottom of Meshmerize's controls and paste the key into **License Key**.
3. The output shows *Checking your license key...*, then *Licensed. Thank you!*, and the watermark is gone. Meshmerize and Meshmerize FX are both unlocked on this Mac.

A license covers two Macs. Meshmerize checks in online every few days and keeps working for 30 days without a connection. To move the license to another Mac, type **RELEASE** into License Key on the old one while it is online, then paste your key on the new one (if the old Mac is gone, lost or wiped, give its seat back at beautifulengine.com/oddsandengines/license with your key: it lists your Macs by name). If a message appears along the bottom of the output, it says what went wrong (an unrecognised key, a key already on two Macs, no connection).

Quick start

1. Drag **Meshmerize** from Sources into an empty clip slot and trigger it. You'll see the Meshmerize wordmark, gently swaying — that's the placeholder until you pick a Shape or load a Model File (it is also what Resolume uses for the clip's thumbnail).
2. In the clip's panel, click the **Model File** folder icon and pick a `.glb`, `.gltf`, `.obj`, `.stl` or `.ply`.
3. Pick a **Preset** (Chrome, Hologram, Neon Wire, Shatter…) or start tweaking.
4. Hit **Burst** to blow the model apart and watch it reassemble.
5. Not sure what a control does? Keep *Meshmerize Quick Reference.pdf* (in the download) open — it lists every control with a one-line explanation.

For video mapping: put **Meshmerize FX** on any video clip, choose a model (or a built-in **Shape** like Cube or Plane), and the clip's video wraps onto it.

Supported files

Format	What's supported
glTF 2.0 / GLB	Full node hierarchy, PBR base colour, metallic/roughness, normal and occlusion maps, emissive, alpha blend/mask, textures (embedded, external, data URIs), `KHR_texture_transform`, `EXT_meshopt_compression`, `KHR_mesh_quantization`, vertex colours, **node animations and skinned characters** (e.g. Mixamo exports), default morph-target weights, specular-glossiness materials.
OBJ	Polygons of any size (wireframes keep your quads), MTL materials with diffuse, emissive, roughness/metallic (`map_Pr` / `map_Pm`), normal (`norm`, or a normal or height map under `map_bump`) and ambient-occlusion (`map_Ka`) maps, vertex colours, vertex-only OBJs as point clouds.
STL	Binary and ASCII. Smooth normals are rebuilt with a crease angle so hard edges stay hard. Auto-rotated from Z-up.
PLY	ASCII and binary, meshes and point clouds, vertex colours (including Gaussian-splat colour), UVs.

glTF files compressed with meshopt (`EXT_meshopt_compression`, what gltfpack, Sketchfab and most model sites produce) and quantized ones (`KHR_mesh_quantization`) load as normal. Not supported: Draco-compressed glTF (re-export without Draco), FBX (convert to GLB — Blender does this well), USDZ.

Models are auto-centred and auto-scaled, so a 10 cm STL and a 40 m building appear the same size. Loading happens in the background — Resolume never stalls, and the previous model stays on screen until the next one is ready. Several clips using the same file share one copy in memory.

The **Model File** label shows the triangle count once loaded (`24.5k tris`), or a short reason if the file can't be read: `compressed!` (Draco — re-export without Draco compression), `not found!`, `no mesh!` or `failed!`. Resolume's label column is narrow, so the full message goes to Resolume's log — on macOS, `~/Library/Logs/Resolume Arena/Resolume Arena log.txt`.

Controls

Preset

One-click looks: **Studio, Chrome, Hologram, Blueprint, Neon Wire, Shatter, Crumble, Point Cloud, Liquid Metal, Disco, Neon Trails, Glitch Pop**, **Photocopy** and **Old TV** for the screen textures, plus four that build a Multiply formation: **Hyper Tunnel**, **Beat Grid**, **Mandala** and **Endless Zoom**, and seven sacred-geometry looks in the visionary-art tradition (see *Sacred geometry* below): **Flower of Life**, **Metatron**, **Golden Spiral**, **Merkaba** and **Platonic** build their formation; **Light Body** (rainbow X-Ray glow) and **Gold Leaf** (temple gold) work on any single model. A preset sets the look, lighting, explode, deform, Multiply, audio and post-FX controls — so picking any other preset clears the tunnel or grid again; your model, transform, camera and output settings are left alone. Tweak anything afterwards — it becomes your look. Each preset name says what you get — *Shatter · blows apart on the beat*. The long dropdowns (Preset, Render Mode, Multiply, Video Map) all carry their explanation this way, because Resolume gives a plugin no other place to put one: its Parameter box at the bottom right shows

Resolume's own generic text, and there is no hover tip. For everything else, *Meshmerize Quick Reference.pdf* in the download has one line per control.

Model

- **Model File** — the file to show.
- **Folder** — appears once a file is loaded: every model in the same folder, in a dropdown. Map it to a MIDI knob to flip through a whole folder of models live.
- **Shape** — built-in primitives (Cube, Sphere, Geodesic, Torus, Torus Knot, Cylinder, Cone, Plane — 16:9, great for video) and the **Model Library** below. *Model File* shows your file.
- **Up Axis** — *Auto* uses the file's convention (STL = Z-up, everything else Y-up). Force Y Up / Z Up if a model lies on its side.
- **Moon Phase** — only shown for a moon (the Full Moon, or any file with "moon" in its name): a sun from the side, 0 is full, 0.25 last quarter, 0.5 new, 0.75 first quarter, back to full at 1.
- **Iris Color** — only shown for a model with an iris (the Eyeball, or parts named Iris or Tint in your own files): turns its colour; 0 leaves it as made.

Model Library 56 ready-to-play models, grouped by theme in the Shape menu, yours to use in any show. Every one is a clean quad mesh at a modest count, so the Wireframe modes draw a tidy net rather than a haze of triangles, and shatter effects break it into clean panels. Ten of them — the Head, the two hands, and the Pumpkin, Bat, Headphones, Retro TV, Planet, Rocket and UFO — were modelled from reference photographs and carry their own photographic textures, so in *Shaded* they read as the real thing. The Skull is an anatomical model built from a multi-view reference sheet, with bone-colour, roughness and normal maps that carry the sutures, the pores and every tooth. The Microphone, the Gift and the Football are modelled by hand from multi-view reference sheets: a woven-wire grille (real holes, with the foam liner showing through) over a satin handle with a logo patch on the front that takes a clip; a deep-lidded box in smooth red card with a white satin ribbon and a tied bow, and a gift-tag patch on the front that takes a clip; a pebble-grain leather football with rounded noses, stitched seams, worn stripes, a stitched lace panel and flat laces. The sports set ends with a Pickleball: 40 holes through a hard plastic shell, in optic yellow. Then a party set - a club Speaker (its cone takes a clip), the Earth (NASA's Blue Marble), the Full Moon (NASA's Lunar Reconnaissance Orbiter maps, near side to the front) and an 8 Ball - and a pop-art set: Pop Art Lips, photoreal glossy red lipstick open in a smile over natural teeth and a tongue, the Rave Smiley and a swirl Lollipop. The Mushroom is a cartoon toadstool with big white spots. The Christmas Tree is a fir dressed in real-looking sprigs, glass baubles, a gold bead garland, warm string lights and a gold star. The sacred-geometry set — Seed of Life, Flower of Life, Metatron's Cube, Sri Yantra, Merkaba, Vector Equilibrium, Platonic Nest and Torus Field — is drawn as line art carved in matte white stone (see *Sacred geometry* below). The rest are built to measure with plain materials that take your Color and Texture settings.

The objects have a place for your Logo File where a brand would really sit: on the balls it prints on the panels real ones carry it (a soccer ball's white hexagons, a tennis ball's two felt lobes, both sides of a golf ball), across the record label, the TV's screen, the gift tag. Faces, hands, skulls, characters and planets carry no logo — it would look stuck on — and on those models (and any model with no logo area) the Logo controls hide themselves; your Logo File is kept for the next model that takes one.

The Shape menu lists them in these groups, in this order:

Theme	Models
People & body	Head (a smooth bust — the clip plays in its eyes), Peace Hand and Love You Hand (cartoon gloves), Skull (anatomical, photo-textured), Eyeball
Halloween	Pumpkin, Jack-o'-Lantern (glowing), Ghost, Bat, Frankenstein, Dracula, Skeleton
Love & peace	Heart, Peace Sign
Party	Disco Ball, Star, Diamond, Lightning Bolt, Mushroom
Music & media	Music Note, Vinyl Record, Headphones, Microphone, Speaker, Retro TV
Holiday	Christmas Tree, Snowflake, Gift
Space	Planet, Earth, Full Moon, Rocket, UFO
Sports & games	Football, Soccer Ball, Pro Soccer Ball, Basketball, Baseball, Volleyball, Beach Volleyball, Tennis Ball, Pickleball, Golf Ball, Hockey Puck, 8 Ball — each with a logo area
Pop art	Pop Art Lips, Rave Smiley, Lollipop
Sacred geometry	Seed of Life, Flower of Life, Metatron's Cube, Sri Yantra, Merkaba, Vector Equilibrium, Platonic Nest, Torus Field

Logo areas. The sports items, the Microphone, Headphones, Rocket and Heart carry an invisible logo area: choose a **Logo File** (see the Logo section) and your artwork is printed there, fitted and lit like part of the model; the screens on the other models take it too.

Video on a part. In Meshmerize FX the Surface dropdown offers *Video on* a model's own place for the clip, named after it, and only on the models where it looks right: the Head (*Video on Head*, projected over the whole head like a projector, and *Video on Eyes*, which shows only while the eyes are open), the Eyeball (*Video on Iris*), the Retro TV (*Video on Screen*), the Speaker (*Video on Cone*), the Vinyl Record (*Video on Label*, the whole label), the Gift (*Video on Gift Tag* and *Video on Wrapping Paper*), the Ghost (*Video on Eyes*), the Jack-o'-Lantern (*Video on Carved Glow*: the clip is the candlelight through the carving), the UFO (*Video on Dome*) and the Pop Art Lips (*Video on Mouth*). The rest of the model keeps its own materials. Every other model offers plain *Video* only. The logo area is never a video place: that is what the Logo File is for.

Animation (shown when the model has animations)

- **Animation** — pick a clip (Walk, Run…) or *Rest Pose*.
- **Built-in animations** — fifteen included models can move, each off (*Rest Pose*) until you pick its clip: Pop Art Lips *Talk*, Skull *Chatter* (the lower jaw hinges open), Bat *Flap*, Speaker *Pump*, UFO *Hover*, Gift *Pop* (the lid lifts off an empty box), Rave Smiley *Wink*, Rocket *Thrust* (a flame comes on), Christmas Tree *Twinkle* (the lights blink on and off), Retro TV *Wobble*, Lollipop *Swirl* (the spiral pours inward), Ghost *Drift* (the sheet stirs in the wind), Jack-o'-Lantern *Flicker* (candlelight), Eyeball *Wink* (the iris and pupil squash shut and pop open) and Head *Open Eyes* (the lids part along the line where they meet and the upper lids fold up under the brow, revealing whatever clip is mapped to the eyes; one blink, then they close). Anim Speed and Anim Offset fit them to the beat; everything else (spin, multiply, audio reactions, shatter) works on top.

- **Anim Speed** — −2× to 2×; negative plays backwards, 0 freezes.
- **Anim Offset** — scrub through the animation. With Speed at 0, animate this with Resolume's BPM sync for beat-locked moves.

Look

- **Render Mode**
  - *Shaded* — smooth lighting with the model's materials.
  - *Flat* — faceted, low-poly lighting.
  - *Wireframe* — see-through edges (quads stay quads). Dense scanned models are drawn from an even, lighter net so they read as a shape rather than a solid haze, the far side is dimmed so the near edges lead, and cut-out foliage (the Christmas Tree's needles) is left out so the branches and baubles show.
  - *Hidden Wire* — edges of the visible surface only, like a technical drawing.
  - *Shaded + Wire* — both.
  - *Points* — a point cloud: dots scattered evenly over the surface (every point of a point-cloud file), never darker than a soft grey so black objects (the 8 Ball, the puck, the record) still show.
  - *Chrome* — mirror metal in a studio environment.
  - *X-Ray* — glowing, additive see-through surfaces (holograms).
  - *Normals* — rainbow surface-direction colours.
  - *Unlit* — flat colour or texture, no lighting.
- **Surface** — what colours the model: *Material* (the file's own colours and textures), *Color*, *Gradient* (Color 2 at the bottom to Color at the top), *Rainbow* (cycling). FX adds *Video*, and *Video on …* for each place the model has (see below). Hidden in Wireframe, Hidden Wire and Normals, which draw only the wire colour or the facing colour.
- **Color / Color 2 / Wire Color** — Resolume colour pickers.
- **Wire Width** — edge thickness in pixels.
- **Point Size** — in pixels at 1080p; scales with distance.
- **Rainbow Speed** — how fast the Rainbow surface cycles.
- **Model Opacity** — fades the model (and its glow). Presets leave it alone, so a fade you're riding survives a preset change.

The panel only shows the controls that do something in the mode you're in: the wire colour and width appear in the three wire modes, Point Size in Points mode (or with a point-cloud file), Color for the Color and Gradient surfaces, Color 2 for Gradient, Rainbow Speed for Rainbow, and the Light controls in the modes that are lit. Only the dropdowns change this, never a slider's value, so nothing disappears while you're riding a fader.

Light

- **Light Angle / Light Height** — where the key light comes from.
- **Ambient** — how bright the shadow side is.

- **Gloss** — the highlight. Above the middle it gets tighter and brighter, below it duller; the middle leaves a file's own roughness as authored.
- **Rim** — edge light, great on dark backgrounds.

Transform

- **Scale**, **Position X/Y/Z** — in model units (the model is about 2 units tall).
- **Rotate X/Y/Z** — degrees. Great targets for Resolume's own parameter animation.
- **Spin X/Y/Z** — continuous rotation in turns per second. Spin Y starts at a gentle 0.1.
- **Freeze** — holds everything still: spin, ripple, flow, wobble and the animation all stop where they are. Nothing is reset and no slider moves, so turning it off picks up exactly where it left off. Catch a pose you like mid-spin, hold it through a section, release it.
- **Freeze Spin** — stops only the turning (model spin and Array Spin); wobble, waves, flow and animation keep running.
- **Face Front** — one press turns the model back square to the camera from wherever it is facing at that moment: it eases home over about half a second (the short way round on each axis), the Rotate X/Y/Z sliders reset, and any Array Spin or Random Spin unwinds with it. Spin resumes afterwards from the front-on pose, so pair it with Freeze Spin to hold it. "Front" is the model as its file presents it, so if a file shows its side or underside, change **Up Axis** first.

Camera

- **Distance** — dolly in and out.
- **Field Of View** — 10° for a flat, telephoto look; 90°+ for dramatic perspective.
- **Tilt** — look down on (or up at) the model.

Multiply

Turn one model into many — all drawn in a single GPU pass, so dozens of copies cost little more than one. (Presets own these controls: picking a preset sets up or clears the formation.)

- **Multiply** — the formation:
  - *Off* — one model.
  - *Grid* — **Columns × Rows × Layers** (layers stack in depth).
  - *Ring* — **Copies** around a circle with an open middle; **Rings** adds concentric rings (outer rings hold more copies and turn the other way when flowing).
  - *Mandala* — one copy at the dead centre with **Rings** built out around it. With a negative **Taper** the centre piece is small and the rings grow outward.
  - *Zoom* — an endless zoom: rings bud at the dead centre, grow, pass the corners of the frame and come round again as new buds. Every ring is the one before it scaled up, so it never shows a seam. **Zoom Speed** (the Flow slider) sets the pace — negative zooms in; **Rings** is how many are on screen at once; **Spacing** packs each ring and sets how far apart the rings sit. With **Fit In Frame** on the zoom sizes itself to the picture, whatever the camera and Scale are doing. Try the **Endless Zoom** preset.

    - *Spiral* — a helix of **Copies Per Arm**; **Arms** = 2 makes a double helix.
    - *Sphere* — copies spread evenly over a globe; **Shells** nests globes.
    - *Line* — a row of **Copies**.
    - *Scatter* — copies scattered through space; with **Flow** it becomes a starfield streaming at the camera.
    - *Tunnel* — rings of **Copies Per Ring**, **Rings** deep, running past the camera. Add **Flow** to fly through it.
    - *Flower of Life* — copies on the circle centres of the Flower of Life: one in the middle and hexagon **Rings** of 6, 12, 18… round it (1 ring = the Seed of Life's seven, 2 = the Flower of Life's nineteen). **Flow** turns alternate rings against each other like a kaleidoscope.
    - *Metatron* — the thirteen spheres of the Fruit of Life that Metatron's Cube is drawn from: the centre and six spokes, **Rings** out (2 = the classic thirteen).
    - *Golden Spiral* — a sunflower head: each copy turned 137.5° (the golden angle) from the last, so they pack evenly and the eye finds the Fibonacci spirals. **Copies × Multiplier** sets how many (34 × 7 ≈ 233). **Flow** blooms them out from the centre forever.
    - *Merkaba* — the star tetrahedron: two tetrahedra, one pointing up and one down, and **Flow** turns them against each other. **Shells** nests more Merkabas outward by the golden ratio, alternate shells turning the other way.
    - *Platonic* — copies on the corners of a solid, picked by **Corners**: 4 tetrahedron, 6 octahedron, 8 cube, 12 icosahedron, 13 vector equilibrium (a centre and the cuboctahedron's twelve), 20 dodecahedron. **Shells** nest outward by the golden ratio.
- **Spacing** — distance between copies in model sizes (1 = just touching, 0 = all on top of each other).
- **Row Gap** — the space between rows, rings, shells or tunnel rings, on top of Spacing (1 = the same gap as between the copies in a row). Labelled **Ring Gap**, **Shell Gap** or **Rise** to match the formation; hidden for Line and Scatter, which have no rows.
- **Taper** — grades the copies by where they sit, each ring a fixed factor bigger than the last. **Negative** shrinks the middle and swells the rim: on a Ring or Mandala that gives a tiny core of petals inside a bold outer ring, with the rings packing closer where the copies are small. **Positive** shrinks the outside, so the formation recedes — on a Tunnel that reads as forced perspective, the far rings falling away. At full taper the big end is twenty-four times the small one; **0** keeps every copy the same size. Try the **Mandala** preset to see it.
- **Fit In Frame** — on: the whole formation is scaled to fill the frame like a single model (more copies = smaller copies). Off: copies keep their size and the formation grows past the edges.
- **Align** — Ring, Mandala, Zoom, Spiral, Sphere, Tunnel and the sacred-geometry formations: copies turn to follow the formation (tops point outward on a ring, faces point out from a sphere, tops point in along a tunnel).
- **Array Spin Y / Array Spin Z** — turn the whole formation; each copy's own Spin keeps working on top.
- **Rotate Step** — each copy is turned a few more degrees than the last: cascades and spirals.
- **Random Rotate / Random Spin / Random Size** — per-copy variety: a fixed random tilt, each copy tumbling at its own speed, and uneven sizes.

- **Wave / Wave Speed** — a ripple travels through the copies, pushing them forward and pumping their size.
- **Flow** — copies travel along the formation (grids and lines scroll, rings turn, tunnels and starfields fly at you, a Zoom zooms — it is labelled **Zoom Speed** there). Negative flows backwards.
- **Hue Spread** — shifts each copy's colour around the colour wheel (1 = a full rainbow across the copies). Use a colourful Surface or material to see it.

Sacred geometry. Visionary art — Alex Grey's light-bodies, Android Jones's festival murals, the psytrance and Boom-style VJ sets — keeps returning to the same forms: the Flower and Seed of Life, Metatron's Cube, the Sri Yantra, the Merkaba, the Platonic solids and the vector equilibrium, the torus, the golden spiral, drawn as glowing lattices in perfect radial symmetry. Meshmerize gives you both halves: the *shapes* (the Sacred geometry group in Shape, line art in matte white stone that reads in Shaded, glows in X-Ray and takes Color, Gradient and Rainbow evenly (try **Gold Leaf** to gild it); in Wireframe each tube is kept whole) and the *formations* (Flower of Life, Metatron, Golden Spiral, Merkaba, Platonic). Put one inside the other — a Metatron's Cube on a Golden Spiral, a Merkaba on Merkaba shells — and add Hue Spread, Glow and Trails. The presets from **Flower of Life** to **Gold Leaf** are good starting points: half luminous light-lattice, half temple gold.

Explode, shatter and wobble get a different random pattern on every copy. To stay safe live, Meshmerize never draws more than about 16 million triangles a frame: with a very heavy model, the far end of a big formation is left out rather than dropping frames.

Explode

Every triangle is a shard that can fly off, spin and shrink — on any model.

- **Explode** — 0 = whole, 1 = fully blown apart.
- **Explode Mode** — *Normals* (each shard flies along its surface direction), *Radial* (away from the centre), *Random*, *Crumble* (shards fall like debris).
- **Scatter** — how uneven the distances and directions are.
- **Shard Spin** — shards tumble as they fly.
- **Shrink** — shrinks every shard; 1 makes the model dissolve into nothing.
- **Stagger / Stagger By** — shards leave one after another instead of all at once: randomly, bottom-up, top-down or inside-out. Stagger + Explode on a fader = a model that disintegrates as you push it.
- **Burst** — one-shot: explode and reassemble. Map it to a MIDI pad or a beat.
- **Burst Time** — how long a burst takes.

Deform

- **Twist** — wrings the model around its vertical axis.
- **Wobble / Wobble Scale / Wobble Speed** — liquid, noise-driven surface motion.

Audio

Uses Resolume's FFT (choose the source with the **FFT** selector: composition, layer, or external).

- **Audio Gain** — how eagerly the reactions fire. The bass is always measured against the loudest and quietest it has been over the last couple of seconds, so a track with a sub-bass floor under its kicks reacts the same as a bare kick drum, and turning the composition up or down changes nothing. Gain bends that response: turn it up for a quiet or busy mix (every hit lands at full), down to react only to the biggest kicks. The middle is neutral.
- **Bass Explode** — kicks blow the model apart.
- **Bass Pulse** — kicks pump the scale.
- **Audio Wobble** — the overall level drives Wobble.
- **Bass Spin** — kicks push the spin along.
- **Bass Glow** — the bloom breathes with the bass (works even with Glow at 0).
- **Bass Flash** — each kick flashes the model toward white.
- **Bass Color** — each kick moves the model's colours on around the colour wheel. Turn it off and the colours settle back.
- **Bass RGB Split** — kicks split the image into red / green / blue fringes.
- **Bass Glitch** — kicks slice and shift the image.
- **Bass Trails** — kicks leave longer trails (trails need movement to show: a spinning or flowing scene).
- **Bass Feedback** — every kick throws a luma-keyed echo of the frame outward (see **Feedback** in Post FX). Works on its own or on top of a steady Feedback.
- **Bass Copies** — each kick adds this many copies to the Multiply formation (a 1 × 1 grid bursts into 4 × 4 and steps back down), then they drain away with the kick.
- **Bass Spread** — the Multiply formation expands with the bass. Shown only when Multiply is on, along with Bass Copies — with a single model there is no formation for them to act on.

Kicks are detected as sudden rises in the bass (at most about eight a second), so the punchy reactions land on the beat instead of following a sustained bass line. **Audio Gain** sets how easily they trigger.

Post FX

- **Glow** / **Glow Size** — bloom around bright parts; wireframes and X-Ray love it.
- **Trails** — every frame fades over the next: motion trails, light painting, echoes. 1 = very long trails.
- **Trail Zoom** — the trail streams outward (positive) or sucks inward (negative): tunnels of echoes.
- **Trail Rotate** — the trail turns as it fades: spirals.
- **Feedback** — video feedback: the bright parts of the last frame are laid *over* this one, keyed by brightness, and kept for up to a couple of seconds. The echoes drift outward on their own; **Trail Zoom** speeds that up or pulls them inward, and **Trail Rotate** spirals them. Echoes that dim below the key cut out with a crisp edge rather than fading to mush. On a bright, busy scene keep Feedback around a third and the key above a half, or the echoes fill the frame. Try the **Kick Feedback** preset.
- **Feedback Key** — the luma key: only parts brighter than this echo. Low keys echo nearly everything; high keys keep only the highlights; at 1 nothing echoes at all.
- **RGB Split** — chromatic fringes, strongest toward the edges of the frame.
- **Glitch** — horizontal slices and blocks jump sideways.

- **Texture** — one screen texture laid over the render. *Grain* (film grain), *Scanlines*, *CRT* (curved tube, aperture grille, falloff), *Halftone* (print dots), *Dither* (few colours, ordered pattern), *Posterize* (flat bands), *Pixelate* (chunky blocks), *Vignette* (dark corners), *Crosshatch* (pen shading that thickens in the shadows), *Paper* (fibres and warm stock), *Xerox* (dirty photocopy — blotchy toner, drum streaks, dust and dropouts), *Dry Brush* (broken ink strokes).
  - **Texture Amount** — how strong. **Texture Scale** — coarse or fine; what it changes depends on the texture (grain size, line count, dot size, how many colours are left).
  - **Texture Speed** — only shown for the ones that move: Grain, Scanlines and the Xerox dust. Set it to 0 to freeze the texture in place.
  - **Texture On** — *Model* keeps it inside the model's silhouette. *Whole Frame* puts it over everything, including the background video in FX. On a transparent background there is nothing outside the model to texture, so the two behave the same.
  - Textures are sized in screen pixels but scaled to a 540p reference, so one dialled in on a laptop preview looks the same on a 4K output instead of disappearing into it.

Post FX apply to the model only, never to the background video in Meshmerize FX — except **Texture** set to *Whole Frame*, which is the point of that switch.

Output

- **Background** — *Transparent* (composite over lower layers), *Black*, and in FX *Video* (the model over the clip).
- **Double Sided** — on: both sides of every surface are drawn (safe for any model). Off: back faces are culled (slightly faster on closed models).
- **Antialias** — Off / 2× / 4× / 8× multisampling. 4× is the default.
- **Video Map** (FX) — how the video wraps the model:
  - *Auto* — the model's UVs if it has them, otherwise Box.
  - *UV* — the model's own texture coordinates (best for glTF/OBJ with UVs).
  - *Box* — projected from six sides; works on anything, including STLs without UVs.
  - *Planar* — projected from the front; the video sticks to the model as it turns.
  - *Spherical* — wrapped around like a globe.
  - *Screen* — the video stays in screen space and the model becomes a moving window into it.
- **Model Fade** — seconds to crossfade from one model to the next when you change Shape, Model File or Folder (0.5 by default; 0 cuts). Every new model also starts square to the camera, whatever the spin had turned the last one to.

Logo

- **Logo File** — a PNG (with transparency), SVG, JPG, GIF, BMP, TGA or PSD that is printed on the model's **logo area**: your sponsor, your event, your own mark. It is fitted whole into the area, centred and never stretched — a wide wordmark and a square badge both land right — and it is printed into the surface rather than pasted over it, so it takes the model's lighting and gloss like ink on the material. A logo area is invisible until something is on it — the ball's own leather, seams or dimples show through — and only your artwork's own pixels are printed, so a transparent PNG carries all of

its colour: no plate, no white circle. An SVG is drawn at 2048 px with its shapes, strokes and solid or gradient fills; outline any text before exporting (text objects, filters and masks are not drawn). Clear the file to remove it.

- **Logo Size** — 1.0 (the default) sizes the logo to its spot; turn it up and it grows into the space around the spot, stopping at the edge rather than being cut off. Square marks and long wordmarks are both sized to read well.

Preparing a logo. A transparent PNG at **1024 px on its longest side** (2048 px for 4K outputs or LED close-ups; larger gains nothing), or an SVG with its text outlined. Crop it tight — the plugin adds the margin. A **square or round version** fits every logo area well; a horizontal lockup up to about **2:1** also fills the Football, Heart, Gift tag and TV, but a long wordmark (4:1 and wider) is fitted by its width and gets small on most models. Keep it to one or two words: at 1080p the smallest areas (the Bat, Microphone, Rocket) show a logo about 60–90 px across, so the main lettering should be at least a quarter of the logo's height and nothing — taglines, ® marks, fine print — smaller than a tenth of it. Heavy weights and strokes read best. The object's own colour shows through wherever the logo is transparent, so a logo close to that colour (white on the baseball, golf ball, or volleyball; black on the microphone, headphones or puck) needs its own backing shape or an outline.

- **Logo Size** — 1.0 (the default) sizes the logo to its spot; above 1 it grows until it reaches the edge of the logo area, never cropped.

Built-in models with a logo area: every sports item (the balls, the bat and the puck), the Microphone (on the handle), the Headphones (both ear cups), the Rocket (down each side, reading top to bottom like a launcher's markings) and the Heart (across the front). A model without one prints the logo on its screen instead — the Retro TV's tube, the Vinyl Record's label, the Gift's tag (a sticker on the box front). The logo works in every Surface mode, including *Video on Tagged*, where it sits over the clip like a broadcast bug. In your own files, name a material, mesh or object so it contains **Logo** (any case), and give that part 0–1 UVs across the area.

Video on tagged surfaces (Meshmerize FX)

Name a material, mesh or object in your 3D app so it contains **FFGLInput**, **Video** or **Screen** (case doesn't matter), and Surface offers *Video on …* named after that part ("TV Screen" becomes *Video on TV*), playing the clip on those surfaces only — the TV's screen, a billboard, a phone display — while everything else keeps its own materials. The included **Meshmerize TV.glb** is set up this way. A model with no tagged surfaces offers plain *Video* only. Names with **Logo** are never video places.

A model can offer two places for the clip: put a **2** after the tag word — *Eyes Screen 2*, *Paper Video 2* — and they get their own entry in the dropdown. A tagged part whose material is fully transparent stays invisible until its clip plays, which is how the Gift's tag disappears when the box is showing the video. A tagged part that glows (an emissive material) shows the clip as its light, unshaded.

Video Map *Auto* on the included models. Photo-scanned models carry a texture atlas — their UVs are hundreds of small patches — which would scatter a clip across them. Each of those models names the projection that suits it, and *Auto* uses it: *Planar* for the Ghost and the Bat, *Box* for the Retro TV and the Gift, *Spherical* for the Skull, Head, Pumpkin, Mushroom, Christmas Tree, Headphones, Microphone, Planet, Rocket and UFO. A tagged part playing under *Video on Tagged* always keeps its own mapping,

so the TV's screen and the Ghost's eyes still fit the clip exactly. Picking any other Video Map overrides this. Your own glTF files can do the same: add `"meshmerize_video_map": "planar"` (or `box`, `spherical`, `uv`) to the scene's or the asset's extras.

Put **Hollow** in a material's name for a part that is a hole in the model — the Ghost's eyes are *Eye Screen Hollow*. A hollow part keeps its own (black) material whenever the clip covers the whole model (*Video*, or a *Video on Tagged* set the model doesn't have), so the eyes stay dark holes in a video-covered sheet; if it is also tagged it still plays the clip under *Video on Tagged*.

This follows the `FFGLInput` naming convention from Resolume's original 3D Viewer experiment, so models prepared for that work here too.

A third tag, **Logo**, marks where the Logo File is printed (both plugins). A part can carry both — the built-in *Logo Screen* patches play the clip and take the logo — and a model with no Logo part prints the logo on its first set of video-tagged parts.

Tips

- **Getting models:** Sketchfab (download as glTF/GLB), Thingiverse and Printables (STL), Mixamo (animated characters: export FBX, convert to GLB in Blender), Poly Haven, and Blender's own exporter (File → Export → glTF 2.0, *without* Draco compression).
- **Performance:** a 250,000-triangle model renders in about 2 ms per frame at 1080p on an M2 Max. Millions of triangles work, but load times grow. Points mode on very dense meshes and 8× antialiasing cost the most. Multiply multiplies the triangle count: a 160-skull tunnel with trails and glow runs at about 8.5 ms per frame at 1080p.
- **Beat sync:** Resolume can animate any Meshmerize slider with BPM sync — Rotate Y over 4 beats, Explode on every bar, Anim Offset over a phrase.
- **Stack it:** a Meshmerize source on a transparent background above a video layer, with Resolume's own effects on top (Kaleidoscope over Neon Wire is a crowd-pleaser).

Troubleshooting

- **"ERROR: uses KHR_draco_mesh_compression"** — the file is Draco-compressed. Re-export it without mesh compression (in Blender's glTF exporter, leave Compression unchecked).
- **Model is missing its textures** — keep the textures next to the model (or in a `textures` folder beside it). GLB files embed their textures and always work.
- **Model is lying on its side** — change **Up Axis**.
- **Model looks inside-out or dark** — turn **Double Sided** on.
- **The plugin doesn't appear** — check that both `.bundle` files are in `Extra Effects`, then restart Resolume. On first use of a downloaded copy, macOS may ask you to allow it in System Settings → Privacy & Security.

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Support

Email **support@beautifulengine.com** with your Mac model, macOS and Resolume versions, and what you're seeing.