Flexify 2

Flaming Pear Software

What it does

Flexify is a plug-in filter for paint programs. It warps full-sphere photos — those showing a full view of a scene in every direction — into new shapes that are more attractive or useful. It can also transform maps.

How to install

Illustrated installation instructions are online at www.flamingpear.com/faq.html .

To use this software, you need a paint program which accepts standard Photoshop 3.02 plugins.

Just put the plug-in filter into the folder where your paint program expects to find it. If you have Photoshop, the folder is Photoshop:Plugins:Filters or Photoshop:Plug-ins. You must restart Photoshop before it will notice the new plug-in. It will appear in the menus as Filters->Flaming Pear->Flexify 2.

Most other paint programs follow a similar scheme.

If you have Paint Shop Pro, you have to create a new folder, put the plug-in filter into it, and then tell PSP to look there.

Choose the menu File-> Preferences-> File Locations... In the dialog box that appears, choose Plug-ins from the list. Click "Add." If you are using PSP 8 or 9, click "Browse". Now choose the folder that contains the plug-in.

The plug-in is now installed. To use it, open any image and select an area. From the menus, choose Effects->Plugins->Flaming Pear->Flexify 2.
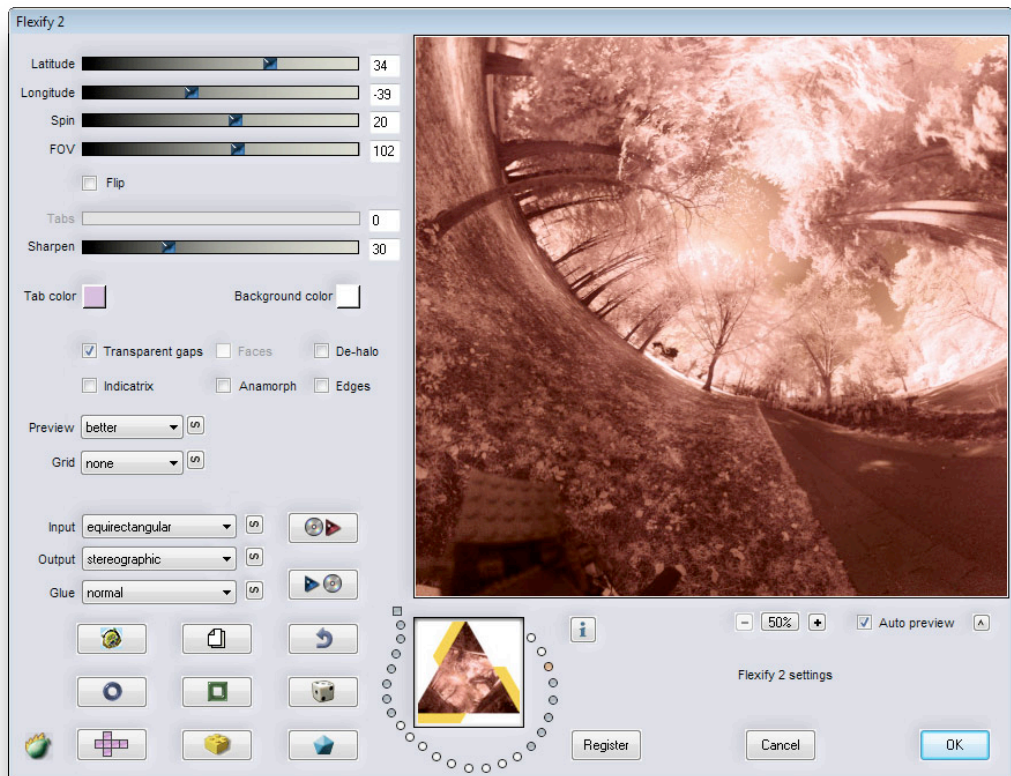
Quick start

When you invoke Flexify 2, a dialog box will appear.
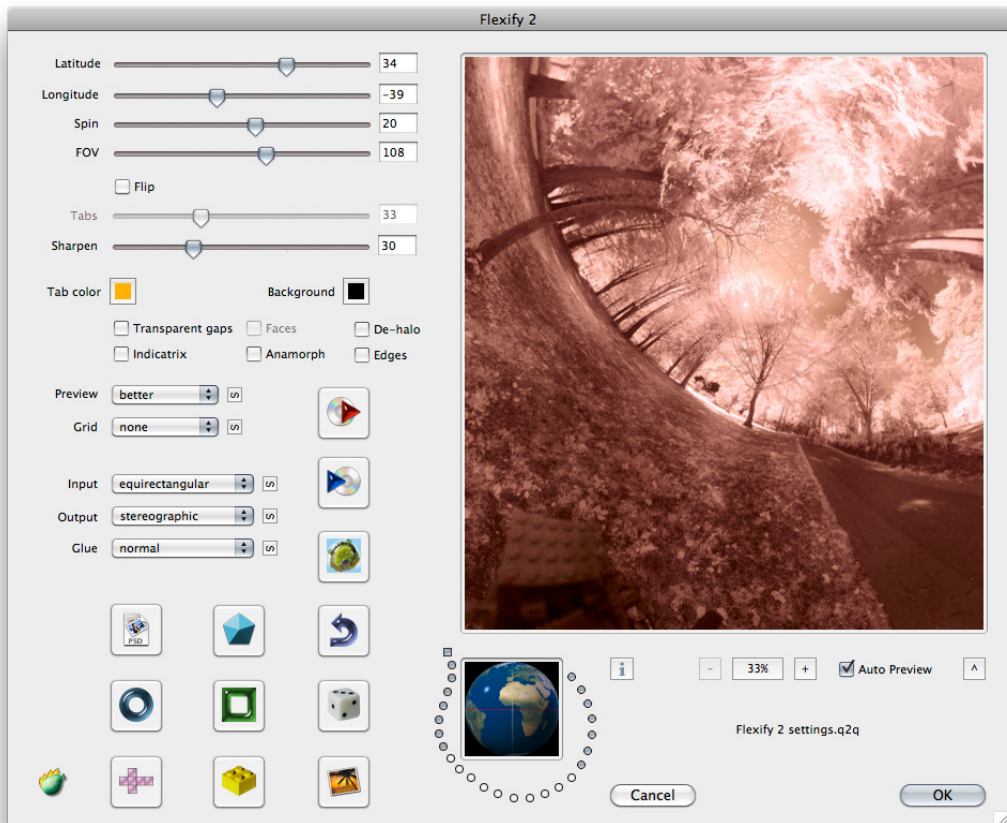
To get a quick idea of what Flexify does, load a full-sphere panoramic image into your paint program (there's a small example panorama here). If the image is circular, the selection should graze the edge of the circle.

Invoke Flexify, and tell it what kind of input image you're using via the "Input" popup menu. Choose a different projection from the Output popup. Click the dice button a few times until you see a result you like; then click OK.

Flexify's capabilities and controls are explained below.

selection should graze the edge of the circle

3

Projections

A projection is a way of unwrapping and warping a spherical surface so that it will lie down flat. It's like making a flat map of the Earth — you have to make a choice about how to deform shapes.

Flexify can accept as input spherical panoramas in any of fifteen projections and can output them in more than fifty. Some of the projections are practical; some are weird and are meant to emphasize the bizarre, vertiginous nature of ultra-wide-angle photography.

Flexify can output these projections:.

equirectangular a.k.a. cylindrical equidistant or plate carrée	The panorama fits into a rectangle. Meridians are vertical, parallels are horizontal, and the north and poles are stretched out to lines at the top and bottom. Scanning panoramic cameras produce this kind of image. Not the same as Mercator.	
mirror ball	The reflection seen in a mirrored ball.	
polar a.k.a. azimuthal equidistant	Angular distance from the center of projection increases uniformly toward the edge.	

orthographic	The image sphere as seen from the outside.	
tetrahedron	An unfolded 4-faced shape. Most of Flexify's polyhedra can be [exported as 3D .obj files]().	
cube	An unfolded 6-faced shape.	
octahedron	An unfolded 8-faced shape.	
dodecahedron	An unfolded 12-faced shape.	

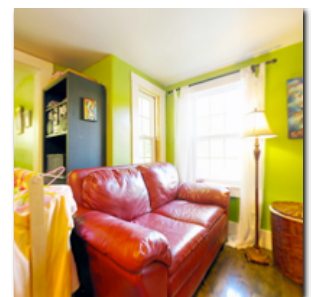|		
icosahedron	An unfolded 20-faced shape.	
Hammer	A 2:1 wide ellipse.	
Werner	A heart-shaped projection.	
sinusoidal a.k.a. Sanson-Flamsteed	A pointy shape.	
rectilinear a.k.a. gnomonic	Like a regular view from a normal lens. Straight lines stay straight. The FOV slider controls the zoom, which can go all the way to a 180° field of view.	

hyperbolic	Produces views balancing naturalness with vertigo. The FOV slider controls the zoom, which can go all the way to a 360° field of view.	
stereographic	Like hyperbolic but with less distortion of scale and shape. The FOV slider controls the zoom.	
cylindrical	This is the format needed for some panorama viewers, including QuickTime VR. The view is infinitely stretched toward the top and bottom, so the vertical view is determined by the rectangle's proportions.	
Wetch	An unusual projection with a finite height and infinite width. The FOV slider controls the zoom, which can go all the way to a 360° field of view.	
pinwheel	Polar with a swirl.	

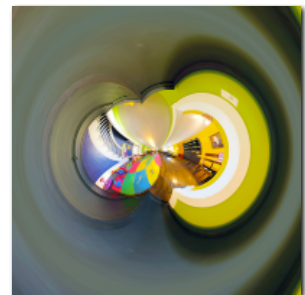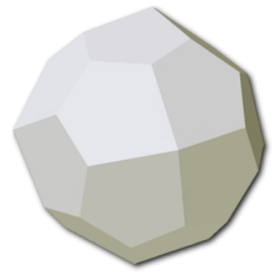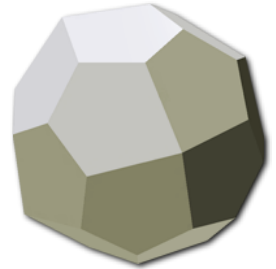|		
lozenge	A wide diamond shape with a crease at the equator.	
square	A square full of creases. Good for scenes containing lots of straight lines.	
curvy	Labrys-like shape with limited distortion. It's the central portion of a mirror ball projection.	
goggles	Goggle-shaped view which presents the whole sphere in a style like the hyperbolic projection, but with less extreme size changes.	
quasar	Weird projection with inside and outside regions bounded by a circular black-hole-like discontinuity.	
14 faces	An unfolded cuboctahedron.	

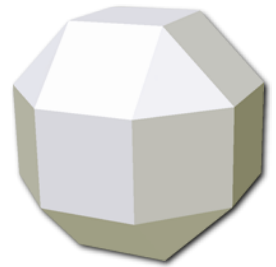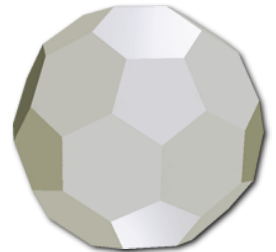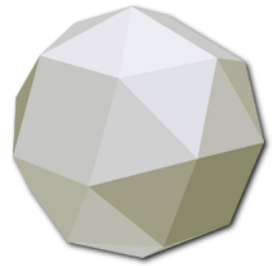| 24 faces a | An unfolded deltoidal icosatetrahedron. | |
24 faces b	An unfolded pentagonal icosatetrahedron.	
26 faces	An unfolded small rhombicuboctahedron.	
30 faces	An unfolded rhombic tricontahedron	
soccer ball	An unfolded truncated icosahedron.	
32 faces	An unfolded icosidodecahedron.	

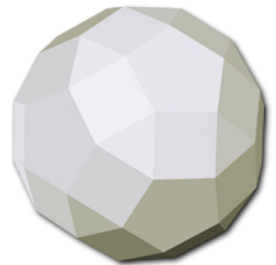| 38 faces | An unfolded snub cube. | |
60 faces	An unfolded deltoidal hexecontahedron.	
62 faces	An unfolded small rhombicosidodecahedron.	
Winkel Tripel	A compromise whole-earth projection often used by the National Geographic Society.	
gores: 12	A shape for globemaking.	
gores: 24	A shape for globemaking.	

gores:multi	A shape for [globemaking](). The FOV slider lets you choose anything from 3 to 36 gores.	
gores: 6/12	A shape for [globemaking](). Shows only half the sphere.	
loop	The scene repeats endlessly toward the horns of the loop.	
two circles	Each half of the scene gets it own hyperbolic projection.	
balloon	A popular origami pattern. Read "Flexify Origami" for folding instructions.	

paperlock	An obscure origami pattern. Read "Flexify Origami" for folding instructions. Fun to write letters on the reverse and fold them into concealment.	
Omnimax	The format of Omnimax 70mm film frames.	
spikeball	A tetrahedron 5-compound, and Flexify's most difficult-to-construct polyhedron. It prints out as ten sawtooth shapes. Each sawtooth folds up into a pair of peaks, and you assemble them all to get the finished shape. Because the shape is so complex, you should start with a very bold, simple picture.	
brick preview	The image sphere built from Lego® bricks. Flexify can create building plans for these spheres. It's explained in the brick sphere part of this guide.	
Mollweide	A 2:1 wide ellipse with parallel lines of latitude.	

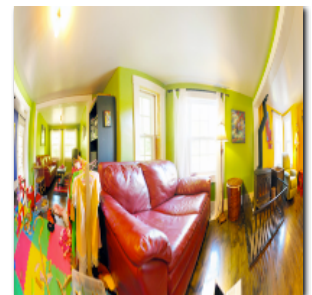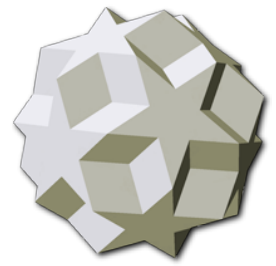|		
icomap	An icosahedron unfolded in a way suitable for planetary maps in some role-playing games.	
star 3	A polar-Werner hybrid.	
star 5	Another polar-Werner hybrid.	
magnipolar	A polar projection emphasizing the center.	
swoop	Rectilinear in the center, blending to hyperbolic at the left and right sides.	

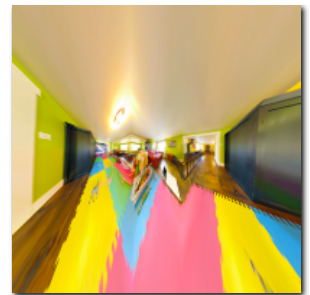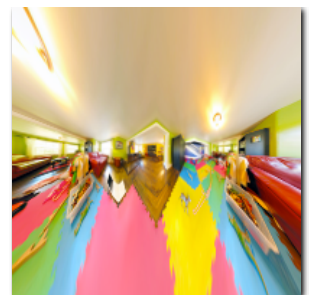| dodo | An unfolded dodecadodecahedron. | |
GID	An unfolded great icosidodecahedron.	
oculus	Rectilinear in the center, blending to hyperbolic at the top and bottom.	
triptych	Three 120° rectilinear views side by side. Great for scenes with lots of straight lines.	
tetraptych	Three 90° rectilinear views side by side. Suitable for presenting rectangular rooms.	

annulus	A ring shape. The FOV slider controls the size of the hole.	
shift lens	Rectilinear with a vertical offset controlled by the Latitude slider. Good for looking up at tall buildings while keeping the buildings' edges parallel.	
Mercator	For making maps with straight loxodromes. Not the same as equirectangular.	
umbrella	An 8-gore shape suitable for making custom umbrellas. The FOV slider sets the length of the petals.	
tetra tile	A tetrahedron unfolded to repeat endlessly.	
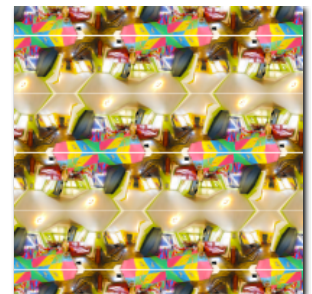
hyper double	The panorama bent to appear twice in one picture.	
hyper triple	The panorama bent to appear three times in one picture.	
Mercator cross	A repeating cross pattern.	
Mercator star	A repeating six-pointed star pattern.	
Lagrange	A conformal projection in a circle.	

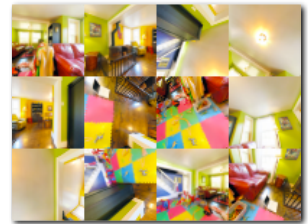|		
rind 1	The image sphere unwrapped like the peel from an apple. The central ribbon makes one pass around the sphere.	
rind 2	A rind with two passes around the sphere.	
rind 3	A rind with three passes around the sphere.	
tunable ellipsoid	Creates twelve gores for an ellipsoidal globe. The FOV slider controls the ellipsoid's proportions. 0 = 0.5:1 skinny ellipsoid. 90 = 1:1 sphere. 180 = 2:1 fat ellipsoid. Or: aspect ratio = $2^{((FOV/90)-1)}$.	
tunable egg	Like the tunable ellipsoid, except the result is egg-shaped.	

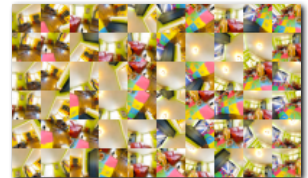| 4 views	Four rectilinear views, rolled at random angles, looking along a uniformly distributed set of directions.	
12 views	Twelve rectilinear views.	
24 views	Twenty-four rectilinear views.	
60 views	Sixty rectilinear views.	
72 views	Seventy-two rectilinear views.	
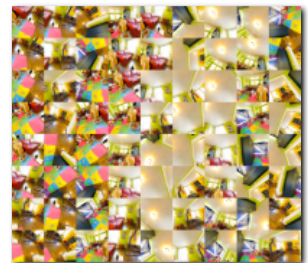
Robinson	A modern map projection.	
equi tall	An equirectangular view stretched to fill the whole image. This is the way equirectangulars worked in Flexify 1.	
semistereo	Midway between rectilinear and stereographic.	
thorn	A cube unfolded, then warped.	
Lagrange 3/4	A conformal projection intermediate between stereographic and Lagrange.	

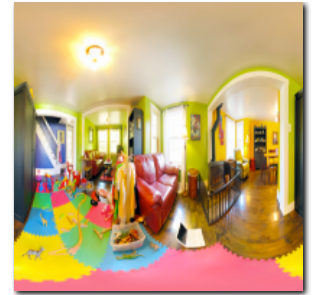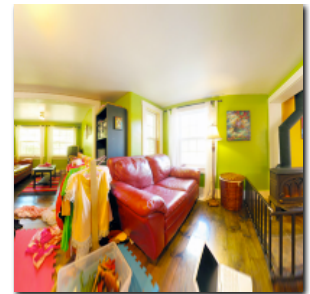|		
squoculus	Good for de-emphasizing the sky.	
thorn levo	A left-handed version of thorn.	
unFish	Good for improving fisheye pictures of people or architecture. Straightens verticals and makes distortion less objectionable over about a 180° field of view.	
Lagrange plus	A Lagrange projection that shows more than 360° horizontally.	
Adams I	A conformal mapping of the whole sphere to a square.	
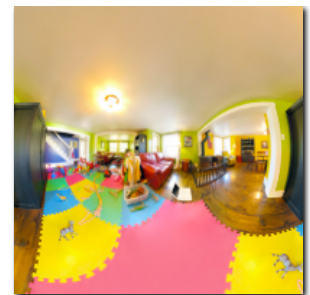
Adams II	A conformal mapping of the whole sphere to a square.	
trecunx	A variant of Peirce quincunx.	
quadracunx	A variant of Peirce quincunx.	
Peirce quincunx	A conformal mapping of the whole sphere to a square. If your input is a world map, set Longitude to 90° to get the standard Peirce map layout.	
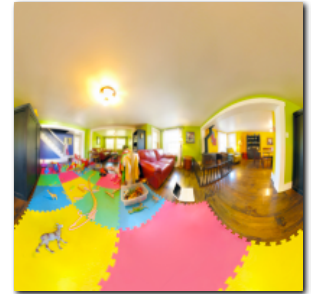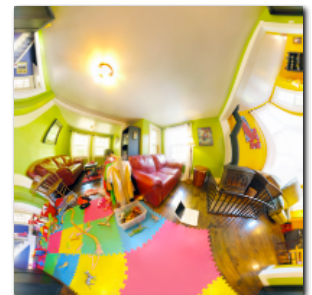
sexacunx   A variant of Peirce quincunx.

septecunx   A variant of Peirce quincunx.

5-star   A polygon.

pentagon   A polygon.

Guyou   A 2:1 conformal rectangle

3-star   An awkward hexagon;
                          actually a star based on a
                          triangle.

triangle   A polygon.

rhombus 1   Each hemisphere in a
                          triangle.

rhombus 2

Another way to present each hemisphere in a triangle.

6-star

A snowflake or star of David.

hexagon

A polygon.

Lee tetrahedric

A less-warped triangular layout.

rectangular tet	Lee tetrahedric dissected into a rectangle.	
2-clover	A two-lobed shape; two stereographic hemispheres.	
3-clover	A three-lobed shape.	
4-clover	A four-lobed shape.	

5–clover   A five–lobed shape.

6–clover   A six–lobed shape.

pentalene   A polygon.

naphthalene   A polygon.

phenathene   A polygon.

shuriken   A four-armed shape.

cross   A conformal shape.

double Guyou   A 4:1conformal rectangle.

wide rect	A 2:1conformal rectangle.	
semicircle	A conformal shape.	
ellipse	A conformal shape.	
Reuleaux 1	One conformal Reuleaux triangle.	

Reuleaux 2	Two conformal Reuleaux triangles.	
Reuleaux 4	Four conformal Reuleaux triangles.	
Reuleaux 8	Eight conformal Reuleaux triangles. Compare [Leonardo's mappamundi]().	
octreleaux	Eight stereographic segments.	

zigzag

A conformal cube unfolding.

chevron

A conformal shape.

monozag

A conformal shape.

3-malta

A conformal shape.

4-malta	A conformal shape.

5-malta	A conformal shape.

6-malta	A conformal shape.

Gilbert	The world warped so everything appears on one side of a sphere.

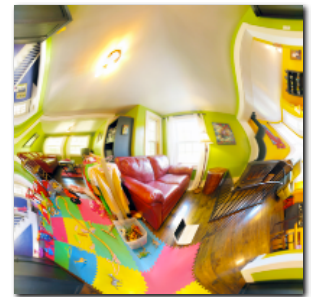|		
stereo twice	Two copies of a stereographic view.	
stereo thrice	Three copies of a stereographic view.	
Adams diamonds	The image sphere in two squares.	
equal-area cylinder	An equal-area projection. Depending on the proportions, this can be Lambert (3.141:1), Behrmann (2.356:1), Edwards 37°24' (1.983:1), Hobo-Dyer (1.977:1), Gall-Peters (1.571:1), or Edwards 50°52 (1.251:1).	

quick globe	A shaded 3D globe.	
equal squarea	A Peirce quincuncial map warped into an equal–area version.	
square fish 1	A square fisheye with strong peripheral distortion.	
square fish 2	A square fisheye with less peripheral distortion and straighter verticals.	

Gilbert globe	The world warped so everything appears on one side of a sphere. With 3D shading.	
pointy	A conformal shape.	
shuriken star	A conformal shape.	
calyx 3	A conformal shape.	

calyx 4   A conformal shape.

calyx 5   A conformal shape.

calyx 6   A conformal shape.

waffle   A conformal shape.

trident   A conformal shape.

astercurve 5   A conformal shape.

astercurve 7   A conformal shape.

astercurve 8   A conformal shape.

trizag   A conformal shape.

shark 3   A conformal shape.

shark 4   A conformal shape.

sunburst   A conformal shape.

2 cylinders	The shape formed by the intersection of two cylinders. A [Steinmetz solid]().	
3 cylinders	The shape formed by the intersection of three cylinders. A [Steinmetz solid]().	
Isle of Man	A rind with three arms.	
shard	A conformal shape.	

starburst

A conformal shape related to sunburst.

3-incurvate

A conformal shape.

4-incurvate

A conformal shape.

phenyl cross

A conformal shape.

anthracene   A conformal shape.

conformal   A regular dodecahedron with
dodecahedron   a conformal graticule.

tattoo 1   A sphere dissection.

tattoo 2   A sphere dissection.

|		
zenith & nadir	Top and bottom cube faces. Good for hand-retouching the poles of a spherical panorama. Later, you can re-import your changes with the zenith-nadir input mode.	
horizontal cross	Cube faces in horizontal-cross form. Good for retouching. Later, you can re-import your changes with the horizontal cross input mode. For best results, use the PSD export and choose 4x3 image proportions.	
vertical cross	Cube faces in vertical-cross form. Good for retouching. Later, you can re-import your changes with the vertical cross input mode. For best results, use the PSD export and choose 4x3 image proportions.	
thirtysphere	A roughly spherical polyhedron with vertices every 30°.	
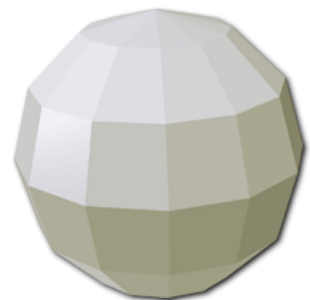
| devtet | A [developable](#) shape made of ruled surfaces. | |
| conictet | A [developable](#) shape made of four cones. | |
| geodesic spheres | Flexify can make several kinds of Class I [geodesic spheres](#). In the output menu, geodesic spheres are named like this:

Geodesic 4\|2 is based on a tetrahedron; frequency 2.

Geodesic 8\|3 is based on an octahedron; frequency 3.

Flexify has all the Class I geodesic spheres from 4\|2 up to 12\|5. Plain Platonic solids like 4\|1 appear elsewhere in the menu. |
 |
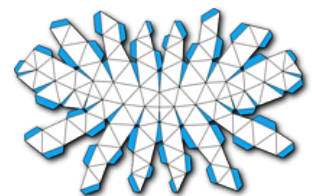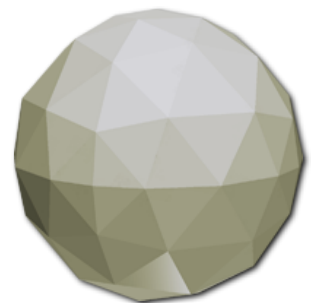
Spericons are developable 3D shapes created by making a regular polygon into a surface of revolution, then twisting one half relative to the other.

In Flexify's output menu, the sphericons are named like this:

Sphericon 6/0 is based on a 6-sided polygon; 0 steps of rotation between the halves; even number of lanes.
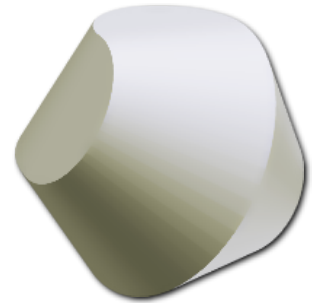
sphericons

Sphericon 6/0+ is like 6/0, but with an odd number of lanes.

Sphericon 6/0/H is hybrid built from half 6/0 and half 6/0+.

Flexify can create all the distinct sphericons from 3/0 up to 11/5. Where two sphericons are chirally equivalent, like 6/1 and 6/5, Flexify offers only the first one.

quatretat

A curly projection.

twistless rind	A developable shape. After work by [D M Swart](#) and [Sebastien Perez-Duarte](#).	
curvy cube	A developable shape. After work by [D M Swart](#) and [Sebastien Perez-Duarte](#).	
baseball	A developable shape. After work by [D M Swart](#) and [Sebastien Perez-Duarte](#).	
sprocket-4	A conformal shape.	
sprocket-5	A conformal shape.	

daycare	An asymmetrical developable shape.

short rind	A developable shape.

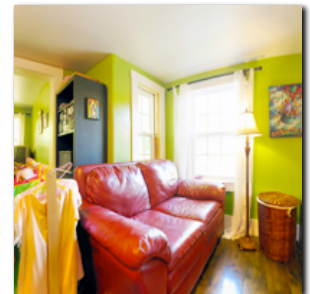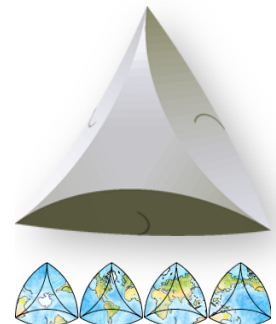|	
Panini	Good for natural-looking, wide pictures with lots of straight lines. Stereographic horizontally, rectilinear vertically. Also called Vedutismo.

YangTet	A quasi-curved-origami shape based on Oschene's tetrahedral teabag box.

To build:

– Render with Edges turned on

– Score along the internal edges

– Cut along the semi-circular marks on each side

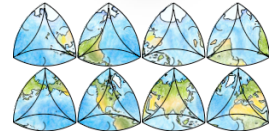– Slide the overlapping lens-shaped parts together. |

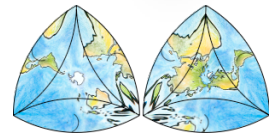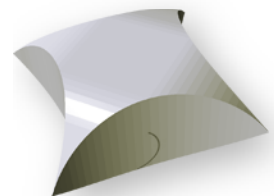| YangOct | A quasi-curved-origami shape, and an octahedral version of the YangTet.

Build it like the [YangTet](). |
| Tribox | A quasi-curved-origami shape.

Build it like the [YangTet](). |
| Squarebox A | A quasi-curved-origami shape with a gnomonic projection.

Build it like the [YangTet](). |

Squarebox B

A quasi–curved–origami shape with a conformal projection.

Build it like the YangTet.
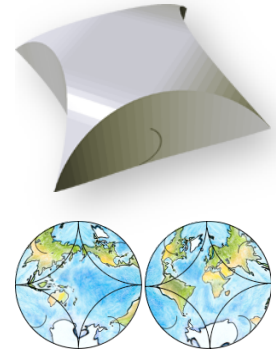
Squirclebox A

A quasi–curved–origami shape with a gnomonic projection. It's based on work by Oschene and vitroid.

There are no semicircular cuts. Just slide the two halves together, alternating the flaps.

Squirclebox B

A quasi–curved–origami shape with a conformal projection. It's based on work by Oschene and vitroid.

There are no semicircular cuts. Just slide the two halves together, alternating the flaps.
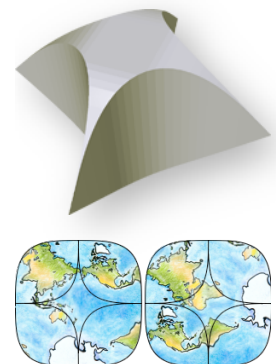
Triskelion fat   A developable shape.

Triskelion meso   A developable shape.

Triskelion skinny   A developable shape.

Triskelion plain   A developable shape.

Triskelion
straight   A developable shape.

Calliope   A developable shape.

Clio   A developable shape.

Euterpe   A developable shape.

Thalia   A developable shape.

Melpomene   A developable shape.

Terpsichore   A developable shape.

Erato   A developable shape.

Polyhymnia   A developable shape.

Urania   A developable shape.

Aglaia   A developable shape.

Euphrosyne   A developable shape.

Naiaid   A developable shape.

Thalassa   A developable shape.

Despina   A developable shape.

Galatea   A developable shape.

Larissa

A developable shape.

Proteus

A developable shape.

Triton

A developable shape.

Nereid

A developable shape.

Halimede

A developable shape.

Folding sphere	A curved origami pattern which folds into a sphere. The FOV slider control the number of segments; a 16 – segment sphere looks nice. Render it with Edges turned on. The straight edges are mountain folds, and the curved edges are valley folds. After work by Jun Mitani, Oschene, and vitroid.	
YangCube	A quasi–curved–origami shape. Build it like the YangTet.	
YangDodecahedron	A quasi–curved–origami shape. Build it like the YangTet.	
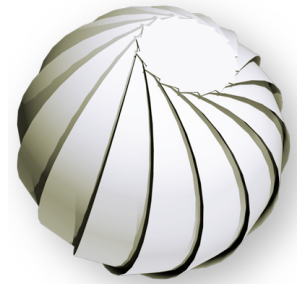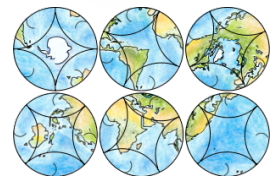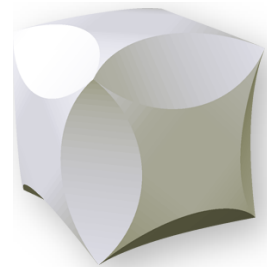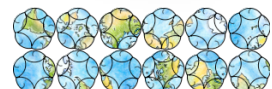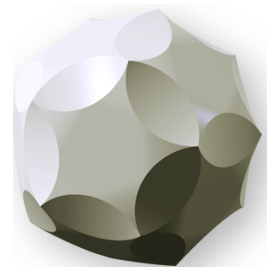
YangIcosahedron

A quasi-curved-origami shape.

Build it like the YangTet.
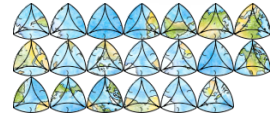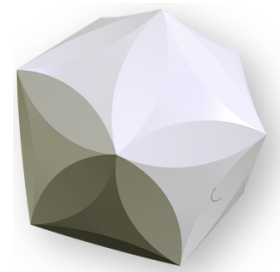
rhombic hexecontahedron A

A polyhedron unfolded so as to yield the crispest appearance when built.
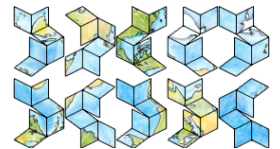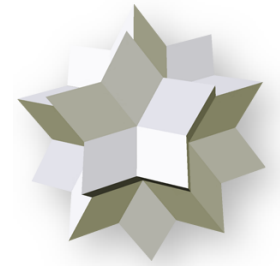
rhombic hexecontahedron B

Like rhombic hexecontehedron A, but easier to assemble.
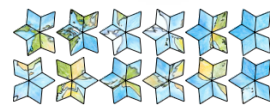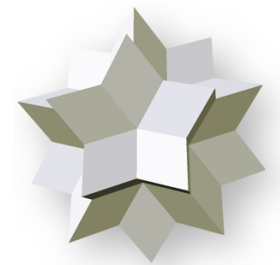
pentbox

A quasi-curved-origami shape.

Build it like the YangTet.
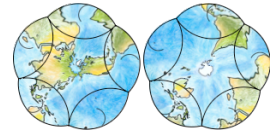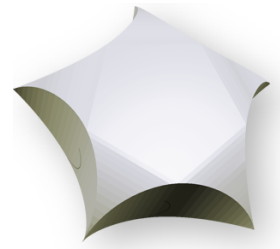
squirclecube

A quasi-curved-origami shape like YangCube but with deeper curves.

Build it like the YangTet.
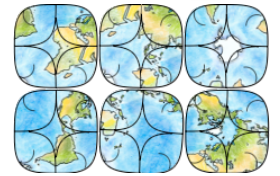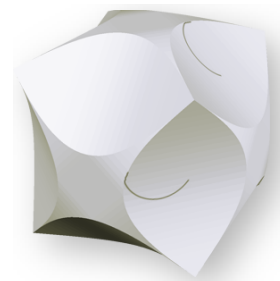
Input

Flexify can accept some of the above projections as input: equirectangular, mirror ball, polar, orthographic, cylindrical, ellipsoid, stereographic, Mollweide, gores:12, Robinson, Mercator, Lagrange, Hammer, Winkel Tripel, equal–area cylinder, gores:6, zenith & nadir, horizontal cross, vertical cross, and soccer. The following projections are for input only.

|		
ellipsoid	A frontal view of a security mirror. The major axis to minor axis ratio is 1.18:1.	
circular fisheye 180°	A circular image showing a 180° field of view across its diameter.	
fullframe fisheye 180°	A rectangular image showing a 180° field of view across its diagonal. The rectangle may have any proportions.	
one cube face	A square showing a 90° rectilinear view.	

tiling cube face	One cube face with all edges alike and symmetrical so that six tiles can seamlessly cover a sphere. You can make these with MakeCubeTile or MakeIsoCubeTile.	
half-equi	The left or right half of an equirectangular image. If your input image is too big for Flexify, you can use this mode to process it in halves.	
Nicolosi	A Nicolosi projection, a popular globular form found in antique world maps.	
quarter-equi	One-fourth the width of an equirectangular image.	
mylar	The reflection in a silver balloon. The major axis to minor axis ratio is 1.55:1.	
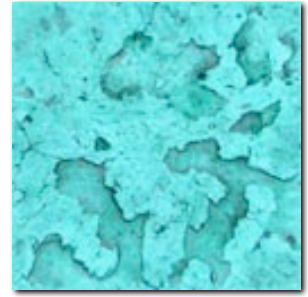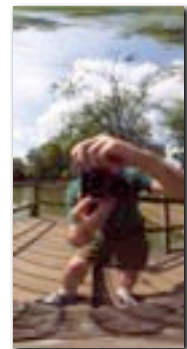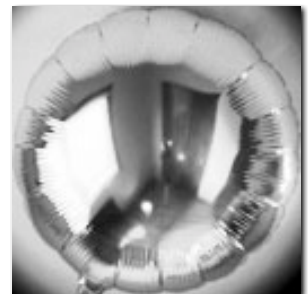
gores: 12 radial	Twelve half–gores, a form sometimes used by the US Geological Survey.	
spinner 360°	An image from a Lomography Spinner 360° camera. Crop the input so it's 360° wide and the height spans from edge to edge of the film.	
spinner guess width	An image from a Lomography Spinner 360° camera with unknown horizontal field of view. Crop the input so the height spans from edge to edge of the film. Flexify will try to guess the horizontal field of view.	
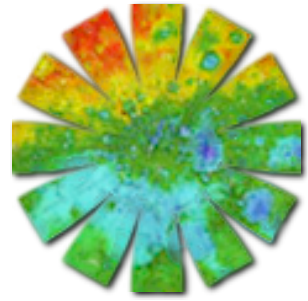
View

You can change the center of projection — the point in the input image that winds up at the center of the output.

Latitude moves the center of projection north and south.

Longitude moves the center of projection east and west.

Spin spins the view around the center of projection.

an off-center hyperbolic view

Flexify can set the center of projection automatically in three ways.

The **reset button** sets latitude, longitude, and spin to zero. This gets you back to the normal view.

reset

The **axis button** sets latitude, longitude, and spin to multiples of 90°. This usually gives symmetrical-looking views.

axis

The **dice button** generates totally random views.

dice

Retouching panoramas

Panoramas often need to be retouched by hand — the tripod needs to be painted out, or moving clouds need to be fixed — but it's hard to paint properly on an equirectangular panorama.

Flexify can help. You can export, retouch, and then re-import panoramas. Three projections have matching output & input modes designed just for this task so you can round-trip an image.

zenith & nadir	Top and bottom cube faces. Good for hand-retouching the poles of a spherical panorama. Later, you can re-import your changes with the zenith-nadir input mode. Flexify will then feather the edges a little to improve blending.	re-imported
horizontal cross	Cube faces in horizontal-cross form. Good for retouching. Later, you can re-import your changes with the horizontal cross input mode. For best results, use the PSD export and choose 4x3 image proportions.	
vertical cross	Cube faces in vertical-cross form. Good for retouching. Later, you can re-import your changes with the vertical cross input mode. For best results, use the PSD export and choose 4x3 image proportions.	
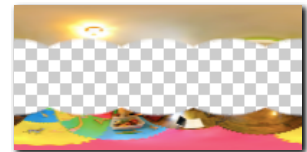
Polyhedra

Flexify has some projections that you can print, cut out, fold, and glue together to make a three-dimensional printout of your panorama.

If you use a map of Earth as your input image, you can make a crude globe.

Tabs sets the width of "glue tabs" that make the polyhedron easier to glue together.

The **Tab color** button sets the color of the tabs.

color button

The **Faces** checkbox shows each face of the polyhedron in a single color, to make it clearer how the shape should be folded together.

The **Export Faces** button offers three ways to export a polyhedron.

export faces

First, you can write a multi-layer Photoshop document with one face of the current polyhedron on each layer. Extra tabs will be added to each face so that everything can be glued properly.

Second, you can export 3D models in OBJ and STL format.

Third, you can export an equirectangular map of all polyhedron faces.

If your image is 32 bits per channel, then each face will be written to a separate document. If you export an OBJ model, its JPEG texture map will still be 8 bits per channel.

Pepakura Designer is handy for editing cut-and-fold paper models.

Other controls

The **Flip** checkbox flips the input picture left–for right. If you're starting with a mirror–ball photo, this will correct backward text.

The **Sharpen** slider makes the image crisper. Sharpening is done in the output image space, so you get the right result even where the picture is strongly warped.

The **Background color** button lets you choose a background color. If your color doesn't show up, turn off Transparent Gaps.

The **Preview** menu improves the appearance of the preview at the expense of speed.

The **Grid** menu places a latitude–longitude graticule over the output.

The **Transparent gaps** checkbox tells Flexify what to do with undefined regions of the input. When this is checked, such areas appear transparent (or black if you're working in the background layer). When it's unchecked, they get a solid color halfway between the background and tab colors. Transparent gaps also makes the border, if any, around the result transparent.

The **Indicatrix** checkbox draws shapes which, on the image sphere, would be circles. It's good for checking how distorted the output is.

The **Anamorph** checkbox produces a special distortion. Ordinarily the image sphere is meant to be viewed by an observer at its center; you could build globe with the image printed on the inside, and it would appear in correct perspective to an observer at the globe's center. When checked, Anamorph moves the viewpoint to the surface of the sphere. You could then build a globe whose inner picture appears correct when viewed through a hole cut in its surface. This viewing point appears as a pinched singularity in Flexify's output.

The **Edges** checkbox draws a black outline around each region of the result. It's good for clarifying the fold lines for polyhedra

The **De–halo** checkbox guarantees that halos don't appear along contrasty edges, but this comes at the cost of making the whole image slightly softer. It's useful in HDR images where bad halos can appear at the edge of the sun or other bright lights.

Plus, **%** and **minus** buttons: if the selected image area is bigger than the preview, these buttons let you zoom in and out. You can move the preview by dragging it around; your cursor will turn into a hand.

Auto Preview:: When this box is checked, the preview automatically updates whenever you move any control.
Turn it off if you want to save time.

Load preset: Flexify comes with some presets, which are files containing settings. To load one, click this button and browse for a preset file.

load preset

Save preset: When you make an effect you like, click this button to save the settings in a file.

save preset

Undo backs up one step.

undo

Brick button shows settings for brick spheres, explained below.

brick

Glue lets you combine the result image with the original, instead of replacing it. The **next-glue** button advances to the next glue mode.

info

Send to iPhoto sends the result to iPhoto (on Macintosh).

iPhoto

Export to PSD renders the result to a .psd image file, which can have custom dimensions.
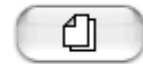
export to PSD

Little Planet quickly gives you the settings that make a little planet image.

little planet

Info briefly explains the controls.

info

Three more buttons:

OK Applies the effect to your image.

Cancel Dismisses the plug-in, and leaves the image unchanged.

Register Allows you to type in a registration code and remove the time limit from the demo.

Memory dots

Although you can [save your settings permanently to files](#), you can also stash settings in memory dots.

Click an empty dot to stash the current settings in it.

Click a full dot to retrieve its settings.

Hover the mouse over a dot to see what it contains.

Option–click to erase a dot on Macintosh.

Right–click to erase a dot on Windows.

If a dot is orange, Flexify's currently using that dot's settings.

Dots remember their contents until you erase them. If you'd rather make a temporary dot that forgets when you exit Flexify, control–click it. Temporary dots are square.

When you start Flexify, it puts the starting settings in a temporary dot. That way it's easy to start over without exiting the plug-in.

On Mac, you can drag–and–drop settings files from the central memory well.

You can build a web page showing how the current image would look with every memdot setting. Just option-click (Mac) or right–click (Windows) on the big memdot image.
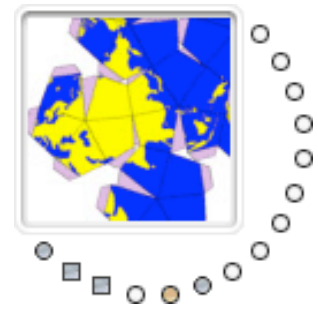
memory dots

○ empty

◉ full

🔘 current

▣ temporary

64

Globemaking

Flexify can warp maps into new shapes for making globes. You can use any of the polyhedron modes, explained above, to make faceted fold–together globes.

You can also make a conventional round globe. First, get a spherical object to use as a form. Traditionally, a plaster sphere is used, but a toy ball will do. It has to be exactly spherical: measure its girth in several places and verify that all measurements are the same.

Next, use Flexify to make "gores" — the lens–shaped strips of map that form a globe's surface. Print these out so that the width of the gores is equal to the diameter of the sphere. Glue the gores onto the sphere, carefully making them conform to the curved surface.

12–gore shape

The Tabs slider adds solid–colored "glue tabs" that make the gores easier to glue together. It also fattens the mapped part of the gores slightly too, so that you need not align them perfectly on the sphere.

The Tab color button sets the color of the tabs.

color button

If you don't want tabs, but do want the gores to be slightly fattened, set the tab color to the same as the background color.

Flexify can also accept gores as input and turn them into a conventional map. Use the input mode gores:12 or gores:6.

Brick spheres

Flexify can create plans for building an image sphere from Lego® bricks. Use the output mode called 'brick preview' to see what you can build.

brick preview

To change settings, click the **brick button**. A new dialog box will appear.

Layers: To suit the proportions of the bricks, Flexify plans a sphere with a diameter 6/5 of the height. For best results choose a height that's a multiple of 5.

Plates: Builds the sphere from 1/3 height plates instead of bricks.

Colors: The best input images have vivid colors and strong, simple shapes.

For output you can choose among 12 **colors**: black, blue, brown, green, dark grey, light grey, red, sand red, tan, white, yellow, and sand green.

brick button

Light grey bricks will represent any undefined regions.

You can make three kinds of output:

— a multi–layer Photoshop document where each layer of the document is the plan for one layer of the sphere

— an LDraw model

— a text file with counts for each color of brick.

In the Photoshop document, parts that aren't visible from the outside are marked with black dots, so you can substitute other colors there. The sphere plan is hollow and just thick enough form a solid surface so you'll need to build supports inside as you go.

The plan doesn't specify exactly what bricks to use, just what colors go where.

There are some related links later in this document.

Cube maps

Flexify can split a panorama into six cube faces. Some panorama viewers want this format, and it's often used to make "sky boxes" in 3D action games.

Click the **cube map button** and a new dialog box will appear asking for the size of the faces. Flexify will write six Photoshop documents containing the cube faces.

Frequently asked questions

I want to make maps and globes with Flexify. Where can I find suitable input maps?

Here are some places to start looking:

NASA's Blue Marble imagery

Virtual Terrain project links to many map sources

NASA Jet Propulsion Lab maps of most Solar System bodies

Ars Technica earth map

Living Earth maps of Earth, Moon, and Mars

Björn Jónsson's planetary maps

LunarCell synthetic worlds

You can use Flexify's polyhedron and gore modes to make cut–and fold globes.

How do I make a spherical photo without expensive special equipment?

Get a plain silver spherical Christmas–tree ornament and photograph it.

How do I improve photos of ornaments?

Panoramas made with the mirrored–ball technique always have a flaw at the point opposite the camera. You can either paint this out, or you can photograph the ball twice from two locations about 90° apart around the ball's equator.

Unwrap both reflections; their flaws will be in two different places. Use the good part of one image to replace the flaw in the other.

Since the reflection in the ball contains the whole scene, the sun or another light source will probably appear in it, and this can cause your camera's auto-exposure to darken the whole picture. Avoid this by using a manual exposure setting appropriate for a typical part of the scene.

The best ornaments to use are blown-glass ones from eastern Europe, but there are other kinds of mirrors you can use:

Gazing balls. These are garden decorations originally popular in Victorian England, and they can be found at some garden-supply stores.

Safety/security mirrors. These are the dome-shaped mirrors sometimes seen at busy corridor intersections at airports and warehouses. These are usually not hemispheres but ellipsoids with proportions of about 1 : 0.85, so you should use the 'ellipsoid' input mode.

Large steel ball bearings. The makers of HDR Shop have hints on where to get them.

Hemispherical mirrors from "whole sky cameras." These are hard to find since meteorologists now use fisheye lenses for sky photography.

Large steel or copper mixing bowls don't give sharp reflections, but they are inexpensive and can produce soft, tinted views with streaky blurs around the highlights.

Using a mirrored ball you can make a wide horizontal view panorama with no flaw. Place the ball on the ground and photograph it from directly above; or hang it from something and shoot it from below.

Use a zoom or telephoto lens to get far from the mirror and minimize the size of the camera in the picture.

To enable a telephoto lens to focus closer, use it together with a close-up lens. That this will reduce depth of field, making focussing trickier.

What is the difference between equirectangular and Mercator?

An equirectangular image shows the whole sphere, usually in a 2:1 wide rectangle. The north and south poles are stretched out to lines at the top and bottom, and the lines of latitude and longitude make a uniform grid of squares.

A Mercator projection shows most of the sphere, but not the poles or nearby regions, because the complete projection is infinitely tall. The lines of latitude and longitude form rectangles that stretch taller the further they are from the equator.

Although Mercator projections are notorious for making Greenland look as large as South America, they have two useful properties. They are conformal, which means angles are accurate within small regions. And they show lines of constant compass bearing as straight lines. These lines, known as rhumb lines or loxodromes, are useful in air and sea navigation, which is why Mercator maps are still used.

So:

Equirectangular images are good for panoramas and spherical texture maps. Mercator maps are good for sailing across an ocean.

How do I make a cylindrical QuickTime VR panorama?

Make an cylindrical projection, then turn it sideways so the bottom is on the right. Convert it with QTVR Make Panorama 2 (Mac) or VRMakePano (Windows). You can find more detailed instructions here.

How do I make a cubic QuickTime VR panorama?

Make an equirectangular projection that's exactly twice as wide as it is tall, then convert it with MakeCubic PPC (Mac) or PanoCube (Windows).

What other panorama viewers are there?

Lots; click here for a list.

How else can I (ab)use Flexify?

Straighten out the horizon in panos shot off-level.

Warp an HDR lighting environment so it's easier to paint out the tripod.

Use it on non-panoramic photos to make them weird.

Distort the same image twice or more in a row to make it weird.

Photograph safety mirrors and security-camera bubbles in public places. De-warp the reflections to see what they see.

Extract a normal (rectilinear) view from the input.

Take a photo of a spherical object like an orange or the Earth and see what it would look like from a different point of view. Use orthographic input and orthographic output.

Make many-sided dice for role-playing games. Use only polyhedra whose sides are all the same shape; otherwise the die will be biased.

Make weird graph paper. Start with a blank white image and turn the grid on.

What are some panoramic photo resources on the net?

Panoguide.com — info for beginner to semi-pro panoramic photographers

Panorama Tools — software to view, create, edit and remap panoramic Images

Evermore QTVR links

International Association of Panoramic Photographers

Panoramic Network — galleries & info

Panoscan — high-end scanning cameras

Apple's QuickTime VR developer tools

Where can I get Lego® info and bricks?

eBay — good for used bricks

BrickLink — extensive selection

Virtual Lego — a book about Lego® software

Lego Shop — the official source

LDraw — model-planning software

LUGNET — users' group with extensive resources

Version history

Version 2.6.9

Adds four new output modes: rhombic hexecontahedron A, rhombic hexecontahedron B, pentbox, and squirclecube.

Version 2.6.8

Adds YangDodecahedron and YangIcosahedron output modes, and spinner 360° and spinner guess width input modes. Faster drawing of all polyhedral output and best-quality output.

Version 2.6.6

Adds YangCube output and Ortelius oval input.

Version 2.6.5

Adds the triskelion fat, triskelion meso, triskelion skinny, triskelion plain, triskelion straight, Calliope, Clio, Euterpe, Thalia, Melpomene, Terpsichore, Erato, Polyhymnia, Urania, Aglaia, Euphrosyne, Naiaid, Thalassa, Despina, Galatea, Larissa, Proteus, Triton, Nereid, Halimede, and folding sphere projections.

Version 2.6.2

Adds the YangTet, YangOct, Tribox, Squarebox A, Squarebox B, Squirclebox A, and Squirclebox B projections. Fixes the missing the offset in shift-lens; proportion problems when exporting unFish, and improper cropping of 6-clover. Basic multicore support for Windows.

Version 2.6.0

Adds the Panini projection. Fixes faint dark lines that could appear in HDR images when "dehalo" is turned off. 64-bit version for Windows.

Version 2.5.2

Adds the sprocket-4, sprocket-5, daycare, and short rind projections. Fixes hairline gaps that can appear in the twistless rind. Fixes blank results when exporting some polyhedra to OBJ files.

Version 2.5.0

New output modes: zenith & nadir, horizontal cross, vertical cross, thirtysphere, devtet, conictet, geodesic spheres, sphericons, quatretat, twistless rind, curvy cube, baseball.

New input modes: six gores, zenith & nadir, horizontal cross, vertical cross, soccer.

Gores 3 of 12 output mode is now properly aligned when longitude = 0.

Option-click on the memdot preview now builds a web page showing how the current image would look with every memdot setting.

Version 2.4.0

Adds the tattoo 1 and tattoo 2 projections. Fixes improper results from exporting cube faces on Intel machines.

Version 2.3.9

Fixes a case where the Mac version can fail to produce a a result after the user clicks OK.

Version 2.3.8

Adds the 3-incurvate, 4-incurvate, phenyl cross, anthracene, and conformal dodecahedron shapes. Fixes artifacts that can appear when "de-halo" is turned off.

Version 2.3.7

Fixes a crash that can happen on Macintosh PowerPC machines.

Version 2.3.6

Adds the shard and starburst projections. Makes the first preview appear faster in the Mac version.

Version 2.3.4

Fixes a case where the Register button may not respond.

Version 2.3.2

Fixes a crash that can happen on PowerPC Macs.

Version 2.3

Adds the waffle, trident, astercurve 5, astercurve 7, astercurve 8, trizag, shark 3, shark 4, sunburst, 2 cylinders, 3 cylinders, and Isle of Man projections. Adds exportation of equirectangular poly-face maps. Brick previews can have antialiasing. PSD export has a "same proportions as original" option. Text entry

of settings. The Mac version has multicore support, drag–and–droppable presets, and a resizable interface.

Version 2.2.5

Adds the pointy, shuriken star, calyx 3, calyx 4, calyx 5, and calyx 6 projections. Fixes cosmetic problems with the interface under Mac OS 10.5.

Version 2.2.4

Adds the square fish 1, square fish 2, and Gilbert globe projections. Improves the handling of input modes which have transparent areas or discontinuities. Changes the Gilbert projection so it reacts more usefully to nonzero latitude settings.

Version 2.2.2

Adds quick globe and equal squarea projections. Improves "best" mode results in strongly anisotropic regions. Removes speckled pixels that sometimes appeared on one edge of previews in "better" mode. Some polygonal projections now show colored faces better.

Version 2.2

Adds antialiased (smoothed) output and preview. New input modes: Hammer, Winkel Tripel and equal–area cylindrical. New output modes: cross, double Guyou, wide rect, semicircle, ellipse, Reuleaux 1, Reuleaux 2, Reuleaux 4, Reuleaux 8, octreleaux, zigzag, chevron, monozag, 3–malta, 4–malta, 5–malta, 6–malta, Gilbert, stereo twice, stereo thrice, Adams diamonds, equal–area cylinder. No more missing graticule lines. Graticule slid over one pixel to the proper location. Added the Tissot indicatrix. Gores:6 output removed; use gores:multi instead.

Version 2.10

Adds the shuriken output mode. Fixes a Windows problem where the plug–in wouldn't remember its registration when it was installed in one user account but activated in another. Fixes a Macintosh problem where the plug–in could have bad settings or crash when installed on a machine for the first time.

Version 2.09

Adds 19 new output modes and the Lagrange input mode. Replaces gores:36 with the more adjustable gores:multi. Improves the appearance near the poles in most conformal projections: no interrupted graticules, no top-to-bottom color wraparound.

Version 2.08

Adds new output modes: thorn levo, unFish, Lagrange plus, Adams 1, Adams 2, trecunx, quadracunx, quincunx, sexacunx, heptecunx. Smoothed out creases in thorn mode. Fixed poor antialiasing in the 4/12/24/60/70 views modes. Fixed a probLem where the latitude-longitude grid would sometimes not appear, and de-cluttered the grid near the poles. More memory dots. Windows PSD export can have a custom size. Mac presets have custom Finder icons.

Version 2.06

Adds new output modes: semistereo, thorn, Lagrange 3/4, squoculus, and box. Universal binary on Macintosh. More memory dots. Exported HDR files can be layered. Exported OBJ files fixed to work with Photoshop CS3.

Version 2.05

Adds exportation of PSD images with custom size; new grid option. New input modes are 12 gores: radial and Mercator. Fixes a problem under Windows where the software could crash on HDR images.

Version 2.04

Adds the equi tall projection. Fixes a problem where the software could forget its registration.

Version 2.02

Adds IPTC keywords and color profiles to all exported images.

Version 2.0

Adds 32-bit high-dynamic-range capability. Can handle images up to 30,0000 x 30,000 pixels, given enough hard drive space. Adds the quarter-equi, Robinson,

and mylar input modes; rind 1, rind 2, rind 3, tunable ellipsoid, tunable egg, 4 four views, 12 views, 24 views, 60 views, 72 views, and Robinson output modes. Memory dots, info button, exportation of 3D models. Changes 'transparent gaps' to make backgrounds transparent too. Equirectangular output is now always 2:1. Cube maps now always export to six separate files. Adds Anamorph and De-halo controls. Exported PSD files now have color profiles. The Mac version lets you use Adobe's color picker.

Version 1.99

Adds the stereographic, hyperdouble, hypertriple, Mercator cross, Mercator star, and Lagrange projections. Fixes tiny flaws in the grid lines and adds a glue mode. Better previews in the file chooser. The Mac OS X version adds the iPhoto button.

Version 1.98

Faster. Adds the Mercator and umbrella projections.

Version 1.97

Adds the GID, oculus, triptych, tetraptych, and annulus projections; sharpening; transparent gaps; polyhedron edges; two new glue modes.

Version 1.96

Adds the dodo projection and face exportation.

Version 1.95

Adds the 6/12 gores projection, and Nicolosi, stereographic, and half-equi input. Works with 16-bit-per-component color.

Version 1.94

Adds the swoop projection and more glue modes.

Version 1.92

Recordable as a Photoshop action. Adds the beanbag projection.

Version 1.9

Adds globe gore input, more brick options including LDraw; the star 3, star 5, and magnipolar projections; and six new glue modes. Improves globe gore output.

Version 1.86

Adds a button for creating cube maps. Adds a six-gore mode and changes gore shapes slightly for better results. Fixes the appearance of previews in presets from version 1.85.

Version 1.85

Adds two input modes: circular fisheye 180° and full-frame fisheye 180°. Fixes tabs on the '24 faces a' shape.

Version 1.84

Adds Mollweide input and output, and icomap output.

Version 1.82

Adds more glue modes and fixes a crash that could happen when using the menus under Windows XP.

Version 1.81

Adds the ellipsoid input mode. Adds new glue modes: Color, Luminance, Linear Light, and Pin Light. Fixes the appearance of text in the interface when running under Mac OS X 10.2.3 .

Version 1.8

Adds the brick sphere.

Version 1.75

Adds the spikeball. Fixes the sizes of the half–polar, Hammer, lozenge, and two–circles projections, which were too small in version 1.7. Changes the tabs on the 'gore' projections to simplify printing them at the right size.

Version 1.7

Adds the paperlock and Omnimax projections, and origami instructions.

Version 1.6

Adds the grid checkbox.

Version 1.5

Adds the '24 faces b' shape.

Version 1.4

Adds the loop, two–circles, and balloon shapes.

Version 1.3

Adds the 12–, 24–, and 36–gore shapes for globemaking.

Version 1.2

Adds the 30–faces polyhedron shape; adds two new input modes, cylindrical and orthographic; and fixes a bug where some polyhedra would not display correctly.

Version 1.1

Adds eight new polyhedron shapes.

Version 1.0

The first public release.

How to purchase

You can place an order online here. A secure server for transactions is available.

Questions

The software, documentation, and supporting materials are made by Flaming Pear Software. Answers to common technical questions appear on our support page, and free updates appear periodically on the download page.

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For bug reports and technical questions about the software, please write to support@flamingpear.com .