Ex Ovo Omnia

Audio studio design has to watch out for 3 main things. Left and right speaker symmetry, standing waves and phase cancellation.

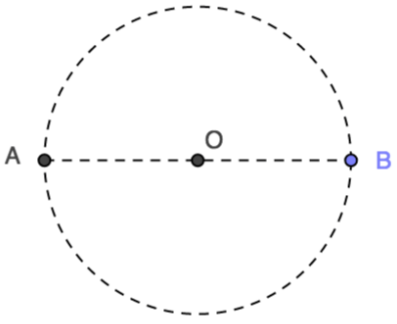
Both standing waves and phase cancellations are problems occurring because of waves being reflected off the walls, floor and ceiling. Either they add themselves or cancel each other out.

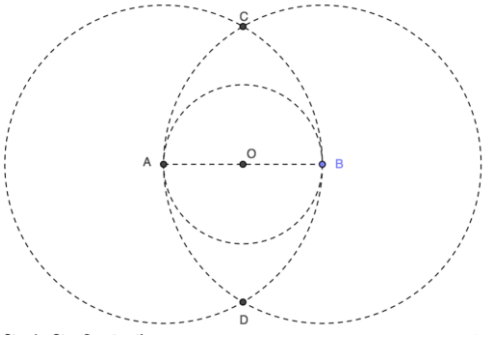
Most studio rooms I know of are made in the shape of a rectangle. All different kinds of ratio are thrown around...and then all different kinds of speaker placement ratios are thrown around.

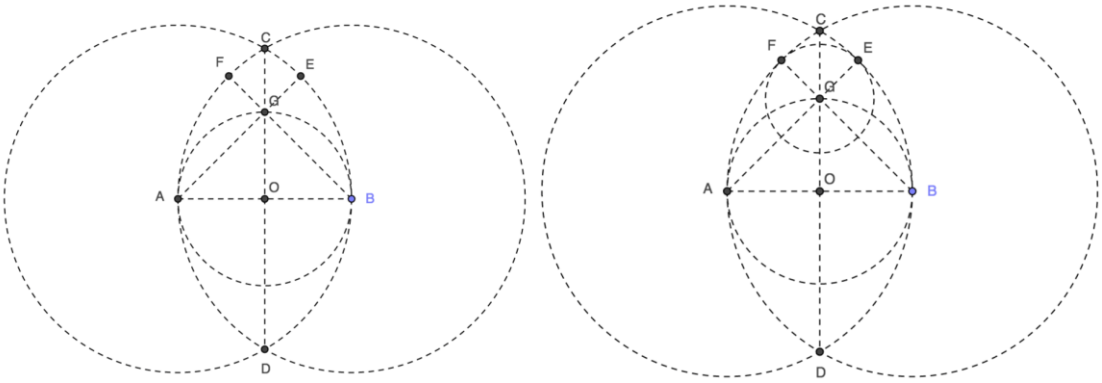
The rectangular shape gives good left and right speaker symmetry. But because of front-back and also floor-ceiling symmetry it gives huge standing waves and phase cancellation problems also.

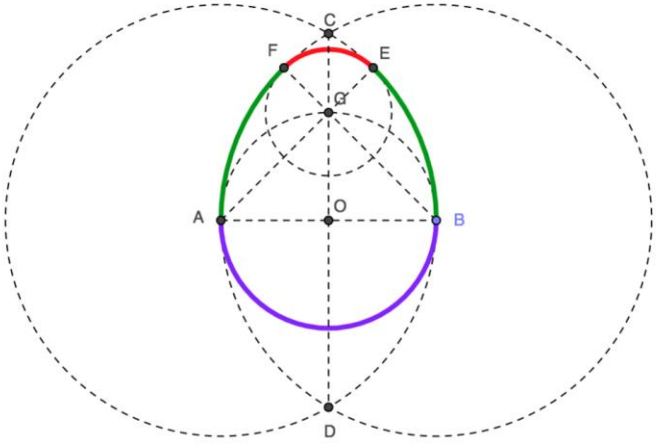
The chicken's egg has good left and right symmetry but no front-back symmetry and no floor-ceiling symmetry.

The Euclidian definition of an egg geometry is,









It has 2 other advantages.

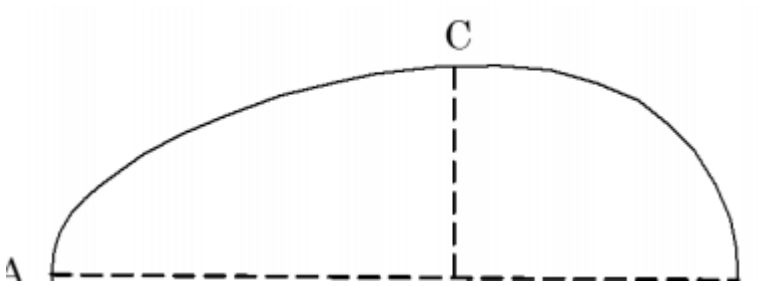
Unlike the rectangular shape, where you have to acoustically treat the wall facing the speakers, bigger the room bigger the wall. Also, the thicker the material for absorption on the wall, the better the room will sound but it will take a good 6 foot of acoustic material to absorb a 30 Hz wave and make the room that much smaller and the treatment that much more expensive.

In an egg-shaped room, with the speakers standing against the broader end of the egg (purple arc AB in figure 5), the speakers face the thinner end of the egg (red arc FE) and it is smaller area to acoustically treat. Also, the smaller, narrower part of the room can have a deep 6 foot cave type trap where all the excess energy is

funneled and absorbed without much expense and it takes nothing away from the room as the narrow end of the egg is too small to be used anyway!

{foot note- the narrower part of the room (represented in the fig with a red line) can also be “open”. As in, it is not be constructed at all, only have audio adsorption material put and have no concrete wall. That decreases reflections, all the energy that is not absorbed is let out of the room. Like open bass port in a speaker.}

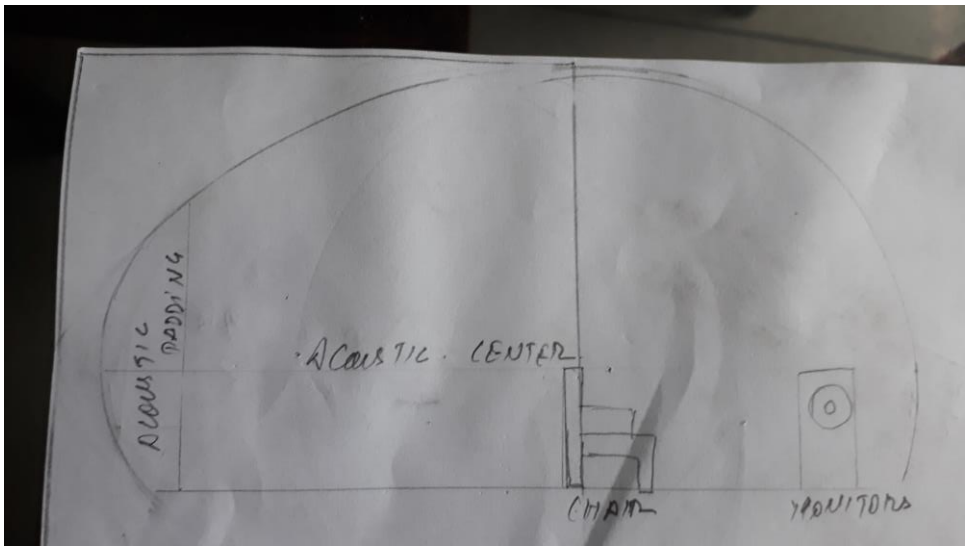
Figure below, point C is the highest point and the end at point A the tinniest part of the room.



The second advantage is that like all ellipses, the egg has 2 centers (points O and G in fig. 5) and therefore 2 sweet spots...one for the engineer and the other for the client.

DISADVATAGE- Since the radius of the circles also decides the height if the studio, the radii cannot be less than 7 feet. Which means the big circle will have a radius of 10 feet, approx. Which makes the width of the studio 20 feet and the length 34 feet...which his way to big!

SOLUTION- The way to getting around that problem is by raising the height by 3 feet. That is rather than cutting the eclipse from the center , we cut it 3 feet below the center. It will look like this



This way we can have a radius of the big circle at 7 feet, the height of the studio will be 10 feet and the smaller circle will come out to be 5 feet in radius and the back end of the studio will be about 8 feet high. It also raises the acoustic center of the room to ear level, when sitting. And the rear acoustic trap will also increase by 3 feet, increasing its efficiency!

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