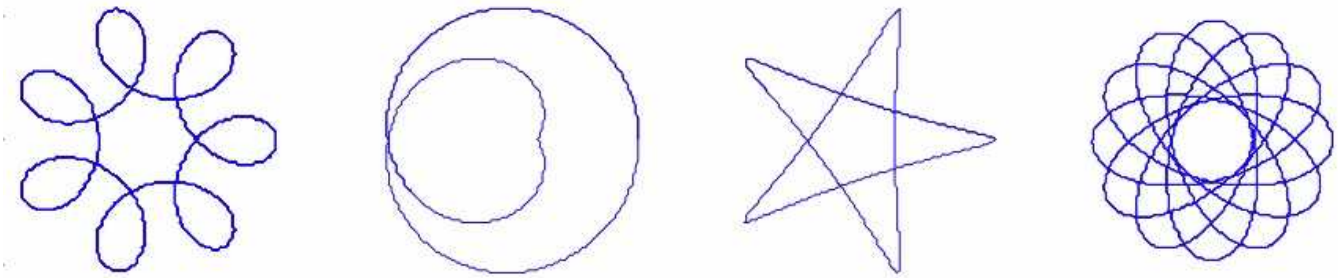
Tea Cups

Find the Teacup ride. Watch for a while and see how it moves!
Do you see that the whole floor moves clockwise, while the three "trays" (each with three cups) move counterclockwise?

Try to follow the motion for *one* of the cups? Which of the drawings gives the best description? Where during the ride do you move the fastest? Where do you move the slowest?



Time to try the ride and feel the forces on (and in) your body. Where during the ride does the Tea Cup press most on your body? (That will be when the motiong *changes* most, i.e. when the *acceleration* is largest)

If you ask very kindly, you may be allowed to bring a *small* cuddly animal in a *short* string.
Hold the animal on a string over the table and see it move during the ride. (You must promise not to drop it!)
How much it moves depends on the acceleration.
Can you estimate the largest angle?

Wave Swinger

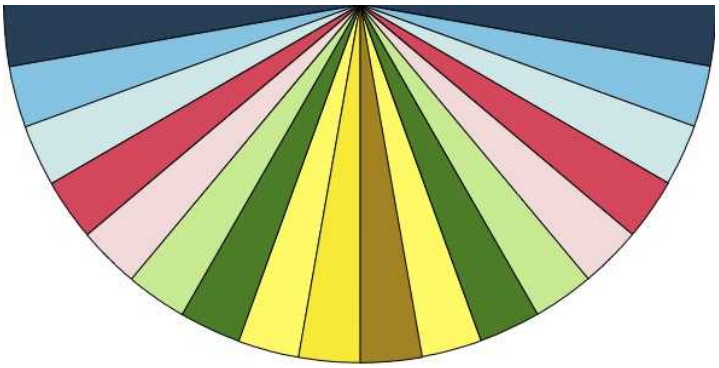
Watch the Wave Swinger at rest. All swings hang straight down.

Which swings do you think will form the largest angle when the ride starts? Do you think that the empty swings will hang out the most or till it be a swing with a very heavy adult?

Horizontal Acceleration

How large is the acceleration? This can be measured with a protractor. If the acceleration had been straight ahead (e.g. when a car starts) 10° would correspond to reaching 50 km/h in 8 seconds. Try it on the journey home!

How large is the acceleration in a wave swinger? (Watch it from a bit further away than the photo below!)

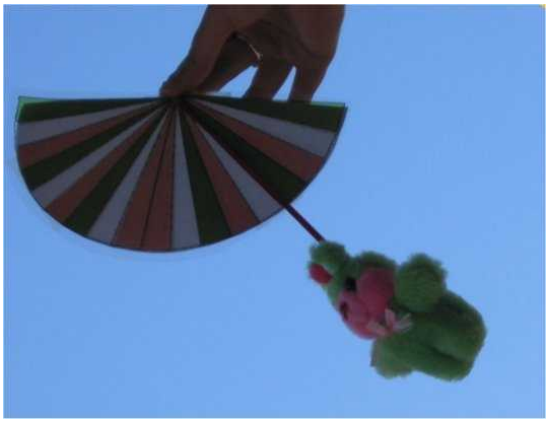


The swings hang out because a sideways force from the chain is needed to change the motion of the swings – otherwise the swings would just continue forward in a straight line.

What do you think would happen to the water in a mug, if you were allowed to bring it on the ride?

In amusement parks, the largest and most common acceleration are those that change the direction of motion without necessarily changing the speed. One example is the Tea Cup ride, where the acceleration may be measured by bringing a cuddly toy on a string.

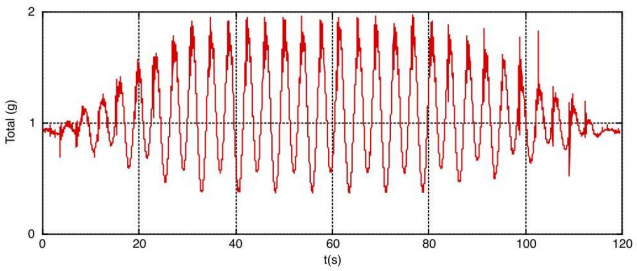
Read more about the physics in wave swingers and other rides on http://tivoli.fysik.org/english/articles/

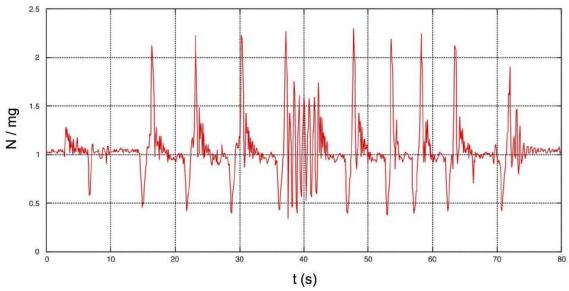


Measuring Acceleration (or rather G forces) in 1, 2, and 3 dimensions

phyphox
physical phone experiments

Which ride?





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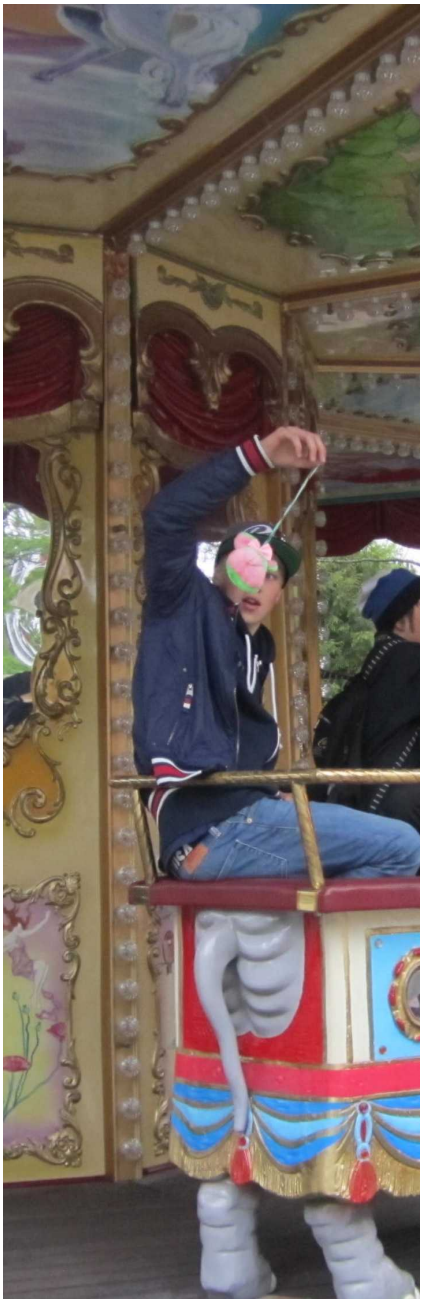
Physics in Europa-Park

Europa-Tower or Carousel



Hold a little cuddly toy on string in one hand. Pull the toy to the side and let go. Hold you hand still while looking at the swinging toy. (If it stops - restart it)

Do you notice that it seems to change direction, e.g. in relation to an elephant or the window

What happens if your start it swinging toward the globe?

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