# Black Strings for Time Travelling

# Contents:

# I

# Thoughts – First…

## *1. Abstract*

*This scientific paper was created to show that there is a number theory coded in the process of particle collision. This number theory is an attempt for theoretical explanation of Riemann's hypothesis and it proves that all numbers (including primes) are laying on the same vector, with limits (-0.5; 0.5)*

*The theory itself is based on the model of semi-conductor like scheme and is called a string theory because of the elements distributed in matrices.*

*For this purpose, I am going to create something out of nothing as I am starting from scratch – only with a white paper and a pencil – and the only measurement I start with is a particle radius – 2 centimetres long.*

*Since I was having fun doing this, I allowed myself to set the tone of the paper as it sounded in my head (for which You are probably going to agree with me later on). And please do not judge me too hard for my mood.*

*Let’s roll the dice... Shall we?*

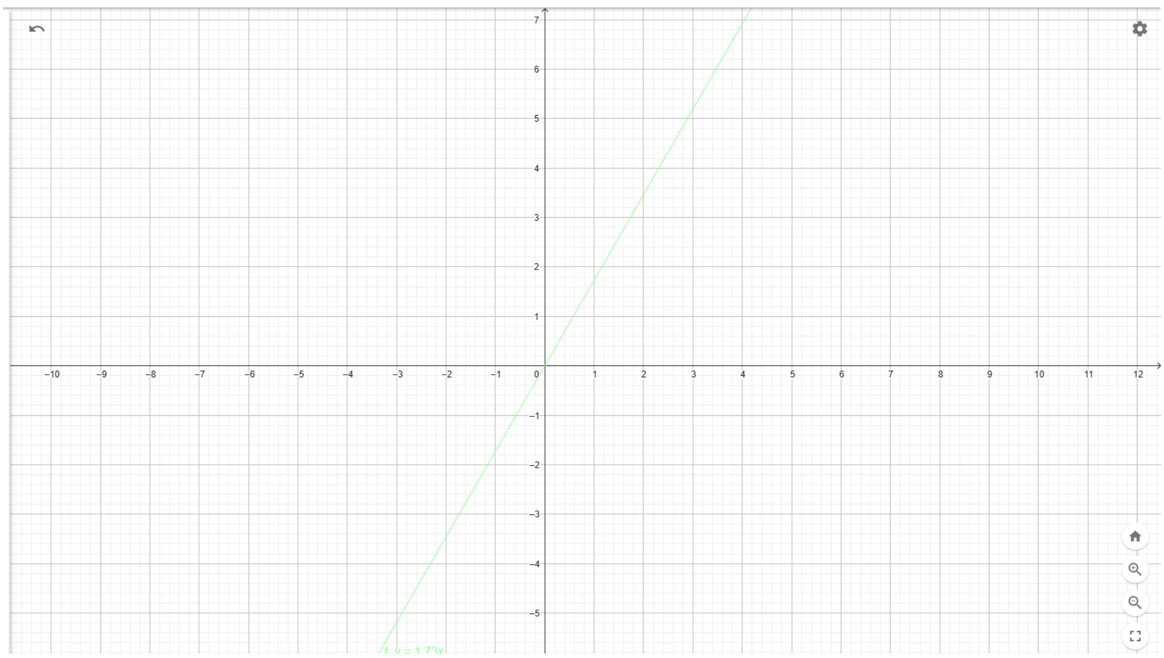
# II

# How to train a Dragon

## *1. First steps in the Dark*

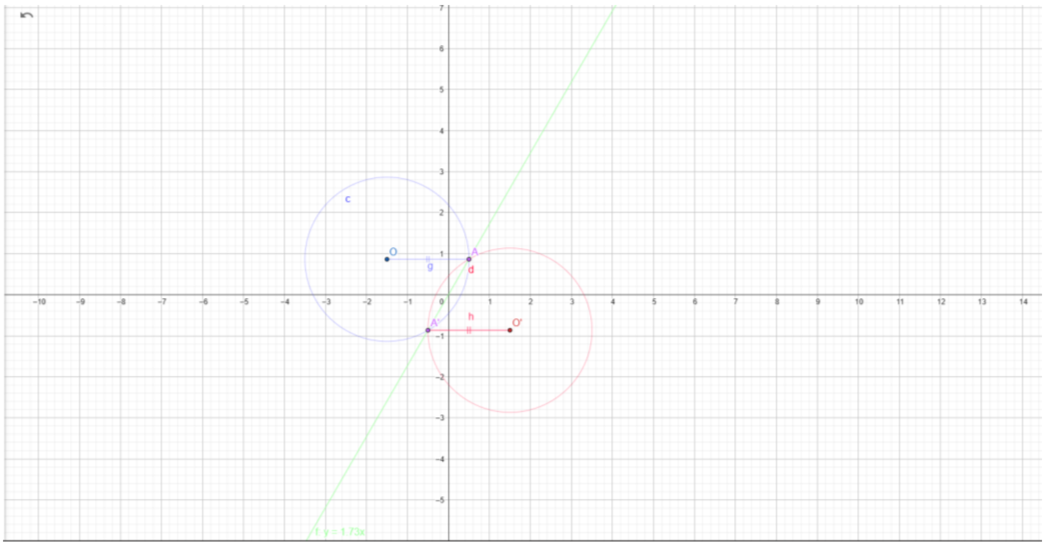
*I would like to collide two particles and after their collision I want them to bounce from each other on a 60° angle. I need to find their coordinates.*

*<u>Step 1:</u>*
*I draw a 60° line through the middle of the x,y axis. It is not necessary the line to be drawn with a perfect angle yet.*



*<u>Step 2:</u>*

*Our particles are going to be circles with radius 2 centimetres. Draw a 2 cm. radius (AO and A'O') starting from the 60° line, parallel on the x axis on both sides of the zero. Y axis does not matter at the moment such as precise measurements on the sketch.*

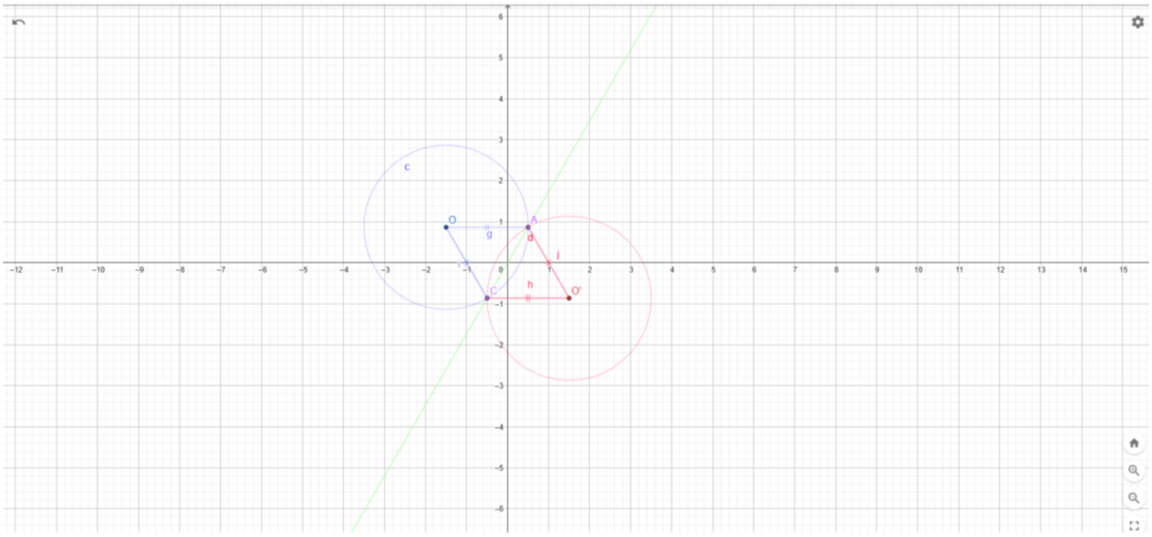



*Then when the circles cross the 60° line again there is point C which coincides with point A' and since it is a circle the line OC is radius = 2cm and vice versa for the red circle – O'A is radius = 2cm.*

*∠OAC = 60°, side OA=OC=r=2cm*

*=> ∠OCA = 60° - with two angles of 60° an isosceles*

*triangle becomes an equilateral one, so AC = 2 and ∠AOC = 60°. It is same with the red circle measurements. So, we have OCO'A as a rhombus.*




*<u>Step 3:</u>*

*OO' coincide with diagonal of the rhombus which means ∠AOO' = $\frac{60}{2}$ = 30° and the angle between the two diagonals equals 90°*

*So, for △O0A we can find O0*

*Cos30° = $\frac{O0}{2}$ = O0 = 1.73cm*

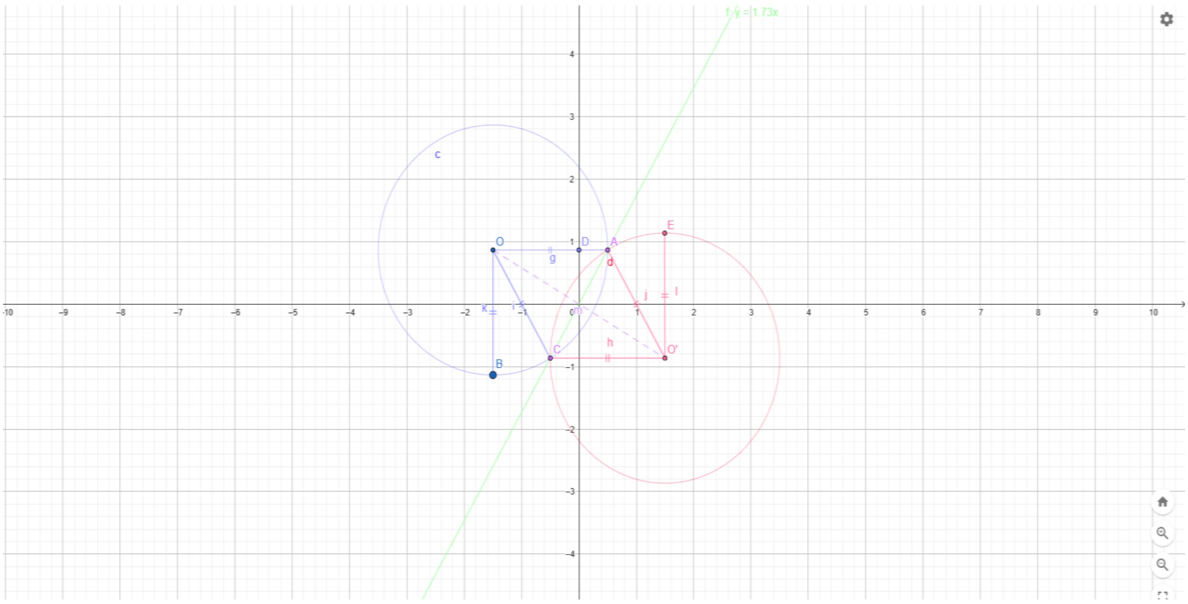
*Therefore for △O0D we can find D0 or the Y cords aka we localize the zero of the coordinate system – our first real measurements.*

*sin30° = $\frac{D0}{1.73}$ = 0.865cm*

*So, the zero (0) is on 0.865cm from radius OA*
*After that it is easy to find the x coordinates by the Pythagorean or again by trigonometry*

$cos30 = \frac{OD}{1.73}$ *=> OD = 1.5cm*

*Same thing we do for finding z coordinates – just replace y with z.*
*Therefore p.O(-1.5x; 0.865y)*
*Vice versa p.O’(1.5x; -0.865y)*




*This is how we find the coordinates of the two particles and the zero of the x,y axis with only a pencil and imagination.*

## *2. Facing the Darkness*

*So far, we have found the exact moment of the collision between two particles. Now we are going to see what happens in the next possible moment in time or what are the exact coordinates of the two particles just after the collision. They have gained kinetic energy at the moment of the collision and this kinetic energy has to be released as a potential energy.*

*This is what causes the movement – just like gravity the kinetic energy reaches a peak and while standing there ( and it is still standing uphill because I am writing this text at the moment instead of releasing this potential downhill by calculating the coordinates and following the movement) doing nothing, cannot gain more kinetic energy because the moment of the collision has passed already, cannot release this kinetic energy as a potential because the moment has not yet came.. so, it is still staying neutral up there just having a potential...*

*I guess Lord Vader would have been proud of me…*

# III

# Time

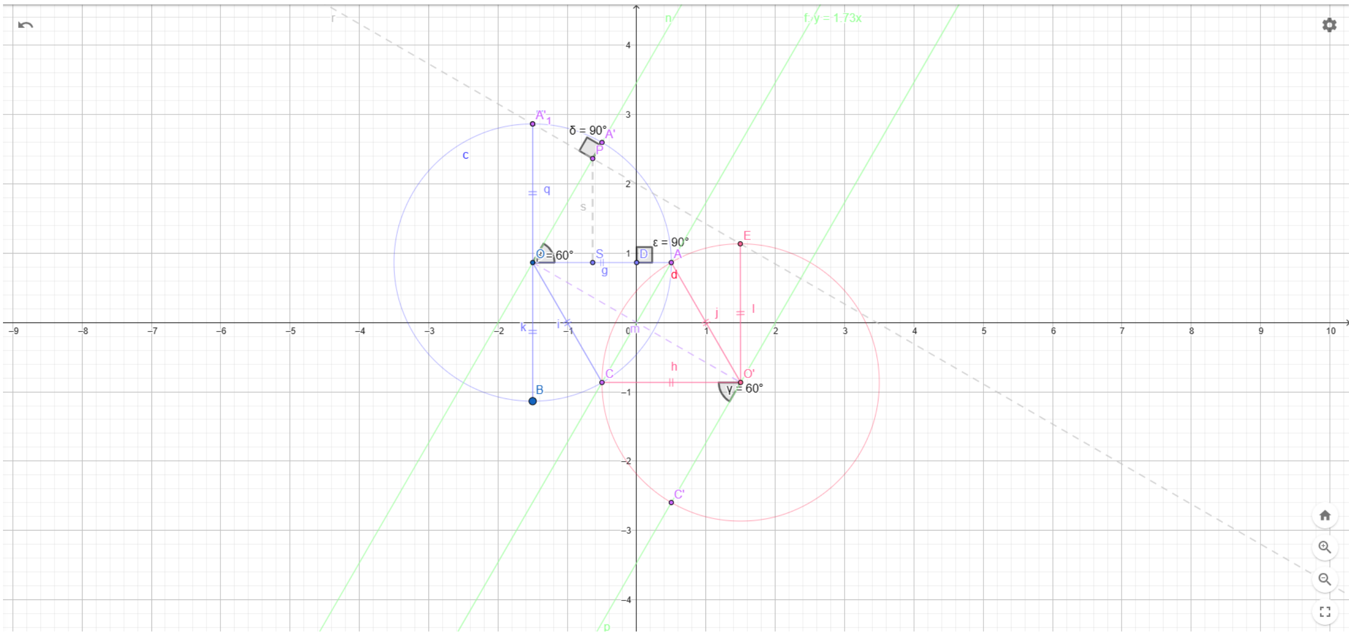
## *1. The smallest unit of time in this Universe*

*In the beginning we set our angle of movement after collision to be 60°. Therefore p.O and respectively p.O' are going on the rails – we put parallel 60° lines through both particle centres so we can orientate the way.*

*For △OKP, sin60° =* $\frac{OP}{OK}$ *= 1.73cm = OP*
*For △OSP, sin60° =* $\frac{SP}{OP}$ *= 1.5cm = SP*
*Cos60° =* $\frac{OS}{OP}$ *= 0.865cm = OS*

*Therefore, our particle has moved for 1 unit of time further on the 60° rail and its new centre is point P => p.P ≡* $p.O_1$

*Therefore, our new centre of the particle p.$O_1$ has coordinates:*
*For x ( -1.5x + OS (0.865cm) = -0.635x)*
*For y (0.865y + SP(1.5cm) = 2.365y)*
*=> $OO_1$ = OP = 1.73cm is the distance that the particle moved for 1 unit of time (the smallest unit of time in our Universe)*
*Vice versa for the red particle – it's centre p.O' is with coordinates (0.635x; -2.365y) and $O'O'_1$ = O'P' = 1.73cm of travelled distance for 1 unit of time.*



## 2. Keeping the pace

*We are back to where we started – we know the new coordinates of the particle and we know the old coordinates of the particle. This means that we have the same particle in two moments of time simultaneously – so the new particle should also have its very own coordinate system with x and y axis and a zero.*

*This way we have two systems:*

*System 1 – particles on the moment of collision (blue and red) and particles after the moment of collision (purple) – this means that this system has a third dimension – time. One unit of time have to pass in order to get this system working.*

*System 2 – particles without time dimension – on the moment of collision and after the moment of collision with their very own coordinate systems.*

*Later on we will be calling System 1 a matrix and we will be naming these matrices as* $S_1, S_2 \ldots S_n$

*Let's find the imaginary zero coordinates:*

*For D,0,F,O p.O0 is a diagonal which is also a h,m,l for*

*△OAC. Therefore,* $\angle AO0 = 30°$ *=> sin30° =* $\frac{D0}{O0}$

*=>* $O0 = 1.73cm = O_1 0_1$

*For the new particle we have the coordinates of the new zero* ($0_1$)*:*

*x (-0.635x (p.*$O_1$*) + 1.5cm) = 0.865x*

*y (2.365y (p.*$O_1$*) + (-0.865cm)) = 1.5y*

*Therefore every new imaginary zero is standing on sin30° from the centre of the particle.*

*For the next unit of time, we can just calculate the coordinates:*

*For p.*$O_2$*:*

*x = (-0.635x + 0.865cm) = 0.23x*

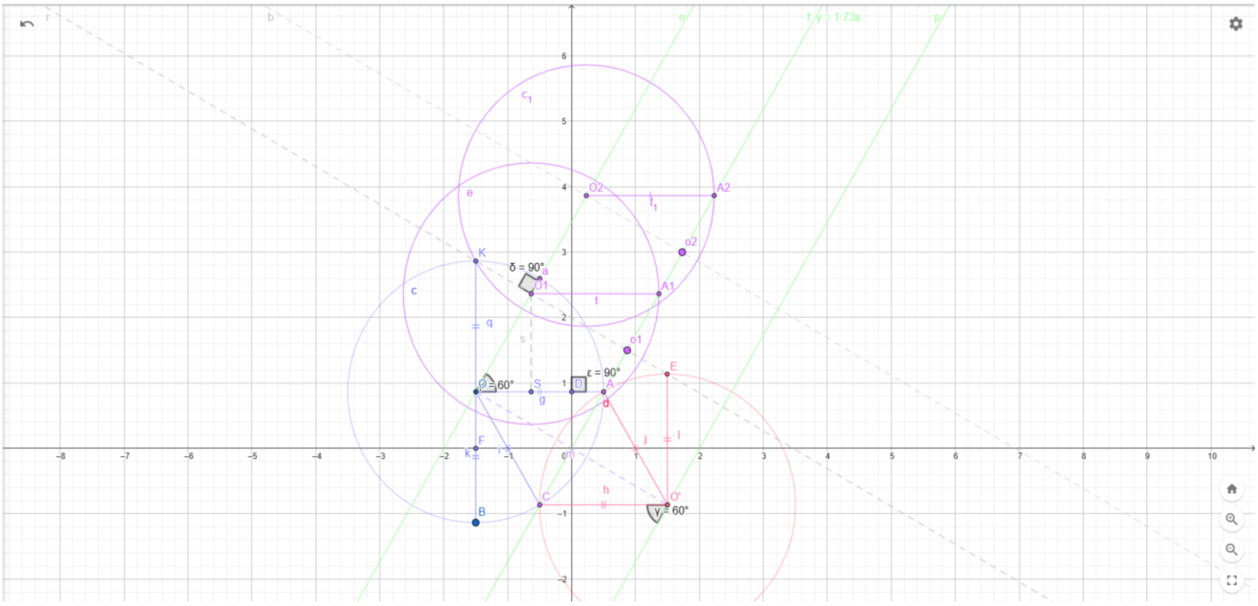
*y = (2.365y + 1.5cm) = 3.865y*

*Therefore for* $0_2$*:*

*x = (0.23x + 1.5cm) = 1.73x*

*y = (3.865y – 0.865cm) = 3.00y*

*and so on...*



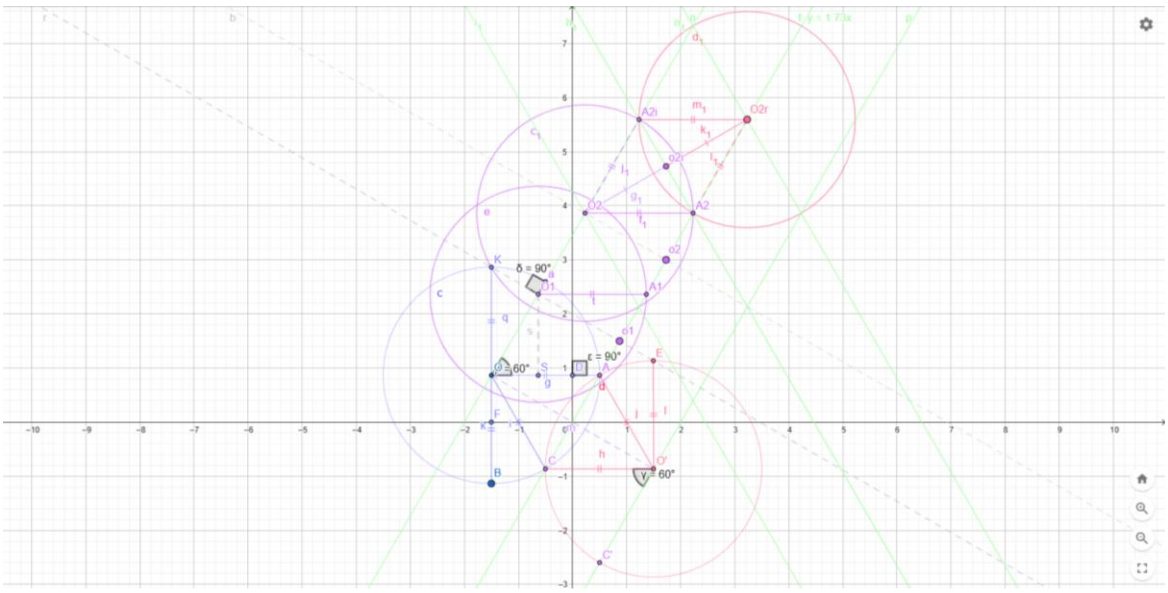

*But… what if we simulate another collision with exactly the same parameters?*

*We have p.$O_2$, we have $0_2$ so now we need to find out the coordinates of point $A_2$ but facing the new collision direction. So, what we have to do now is use the rule and notice that h=m=l in any equilateral triangle. We can find p. $A_{2i}$ ( "I" is because it is the same point in new collision)which corresponds to $A_3$, easily – we need the half side $O_2A_2$ = r = 2 and add it to the x coordinate of p.$O_2$ ( 0.23x + 1cm = 1.23x). So 1.23x is the coordinate of the end point of the h,m,l starting from the $\angle O_2A_3A_2$. We also already know that in these exact triangles h,m,l = 1.73cm so to find the Y coordinate we need to add 1.73cm to the y coordinate of p.$O_2$ - 3.865 + 1.73cm = 5.595y*

*Therefore for $\triangle O_2A_3A_2$* the side $A_2A_3$ is the same as the side CA in *$\triangle ACO$ – the very first particle in the very first collision. This means that this side is the next 60° rail of the second collision. And the zero $0_{2i}$ is located on the middle of the side $A_2A_3$ . We can easily find the coordinates of $0_{2i}$ – x coordinate is the x coordinate of $0_2$ (1.73x).*
*And the y coordinate is $0_2$ + 2 x 0.865cm = 3.00x + 1.73cm = 4.73x.*

*Now we can find the coordinates of the red particle of the second collision:*

*We add radius = 2 to the x coordinate of $A_3$ = 1.23x + 2 = 3.23x is the x coordinate and 5.595y is the y coordinate of the centre of the red particle – $O_2$*.*



## *3. O’(n the) clock*

*Keep rolling and write down the coordinates.*