The Silver Rectangle – A-Formats

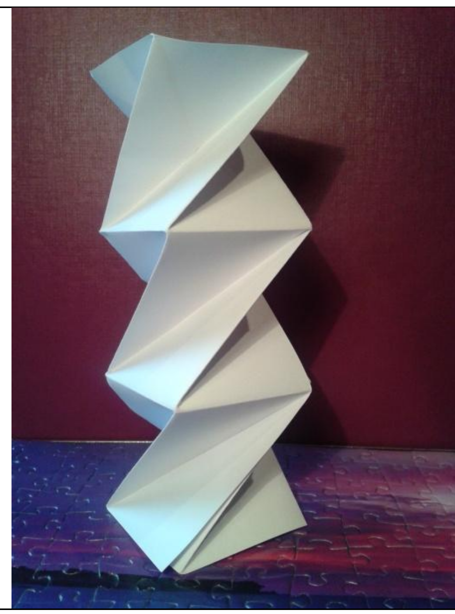
A rectangle, with the side proportions $1 : \sqrt{2}$ is called a Silver Rectangle. It has the extraordinary property that, when it is folded in half (once, twice,…n-times), the proportions of the sides STAY $1 : \sqrt{2}$.

All A-Formats are so-called Silver Rectangles. All A-Formats have sides in the Ratio $1 : \sqrt{2}$. This can be shown using the Theorem of Pythagoras $a^2 + b^2 = c^2$.

Let's take a sheet of A4 paper. The short side has a length of 210 mm, the long side 297 mm. The ratio of the sides = 210 : 297 = $1 : \sqrt{2}$ = 1 : 1,414

But how come, A4 paper has the size that it has? Well, once there was agreement that the sides should have the proportion of $1 : \sqrt{2}$, it was agreed that A0 should have an area of exactly $1\ m^3$. To have this area, the sides had to be exactly 841 mm and 1189 mm long. Halving paper of this size over and over, leads to the following:

A0	841 x 1189 mm
A1	594 x 841 mm
A2	420 x 594 mm
A3	297 x 420 mm
A4	210 x 297 mm
A5	148 x 210 mm
etc.	



Jun Maekawa's "Spiral Tower"

Cutting a square from a Silver Rectangle, it becomes clear that the diagonal of that square, which is nothing else than the hypotenuse of the two such-formed right-angled triangles, has the exact length of the long side of the paper. Assuming the sides of the square have a length of 1 and using Pythagoras, the length of the diagonal is $\sqrt{2}$.

$a^2 + b^2 = c^2$; $1^2 + 1^2 = c^2$; $2 = c^2$; $\sqrt{2} = c$

Let's fold the „Triple Spiral Cube" designed by Jun Maekawa, from his book „Genuine Japanese Origami – 34 Mathematical Models based upon Root 2", ISBN 978-0-486-48335-1. Let's pay particular attention to the long sides of the little silver rectangles on each level of the tower.