

A Journey to the Unimaginably Small

The tiniest division we have on our rulers is the humble millimetre.

Around 10 of them are needed to measure a finger nail.

Tiny it may seem, but let's make the diminutive millimetre into something rather more fitting as our portal into the Lilliputian world of CERN's particle physicists.

Our 1mm column is ideal for measuring the dimensions of this beautiful ice crystal.

But let's zoom into the crystal and find a single water molecule.

It's made up of one oxygen and two hydrogen atoms and is so small that the magnification to view it this size would make our tiny 1mm column stretch to the height of the Alpine peaks that form the backdrop to CERN's laboratories.

If we look at the nucleus of a single one of the water's hydrogen atoms, we discover a single proton containing 3 quarks held together by gluons.

Our 1mm column on this scale would equal the diameter of the moon's orbit around our earth
Inside the proton are 3 quarks

Our 1mm column by comparison would at least be equivalent to the distance between the sun and Jupiter

Zooming in to a quark, CERN's Large Hadron Collider may ultimately point us in the direction of Super Strings. By vibrating in different ways, these super strings may make up the variety of particles we think of today as fundamental.

These super strings are so small, that our 1mm column could, by comparison be equivalent
MUSIC

- not just to the size of our visible universe

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– but to one thousand universes laid end to end.

Strangely, it takes the vast size and power of the Large Hadron Collider - the world's most powerful particle accelerator- to enter this unimaginably small world.