

Powers of ten - Microsoft Internet Explorer

Arquivo Editar Exibir Favoritos Ferramentas Ajuda

Endereço http://microcosm.web.cern.ch/microcosm/p10/english/welcome.html

# POWERS OF TEN

Welcome to Powers of Ten.  
Travel across the Universe.  
Changing scale by just a few powers of ten  
dramatically alters your perspective.

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[What is a Power of Ten?](#)  
[Credits](#)



Internet

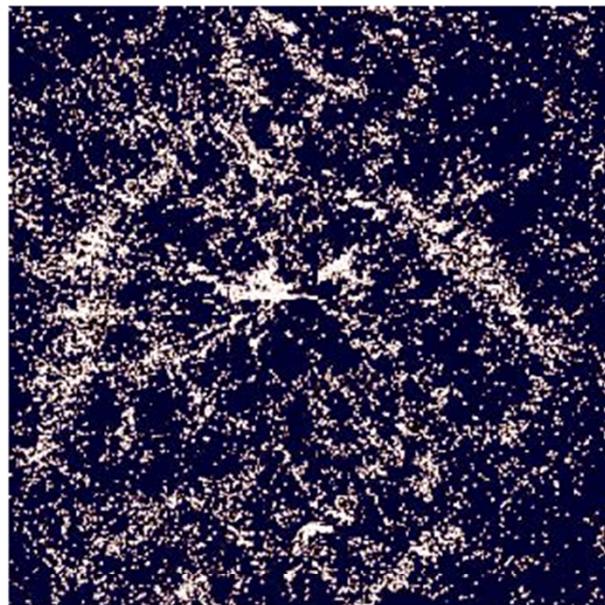


# POWERS OF TEN

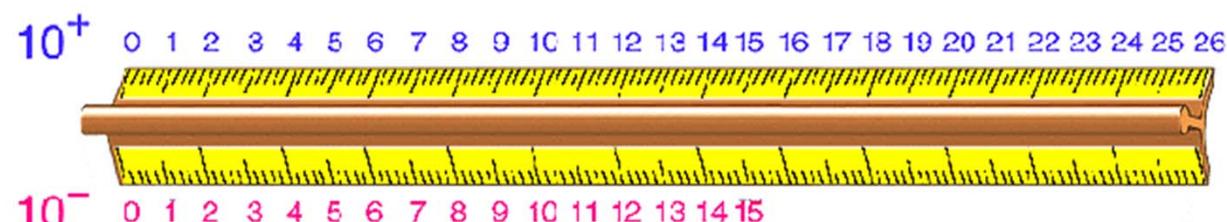


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$10^{26}$  metres = 100 000 000 000 000 000 000 000 metres



The largest scale picture ever taken. Each of the 9325 points is a galaxy like ours. They clump together in 'superclusters' around great voids which can be 150 million light years across.



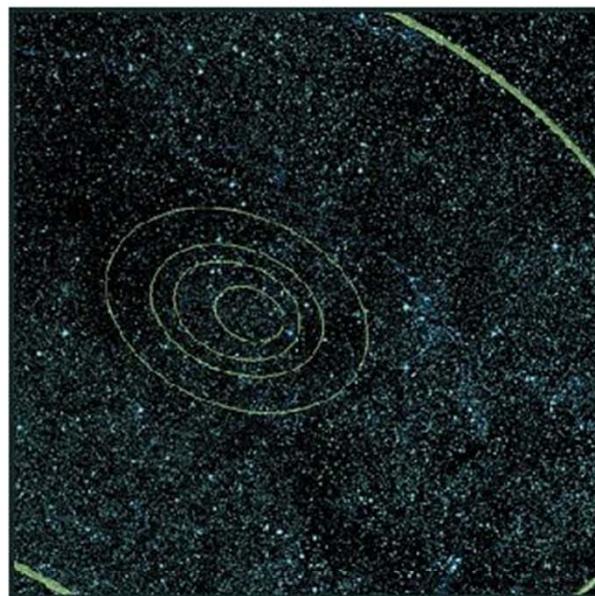


# POWERS OF TEN

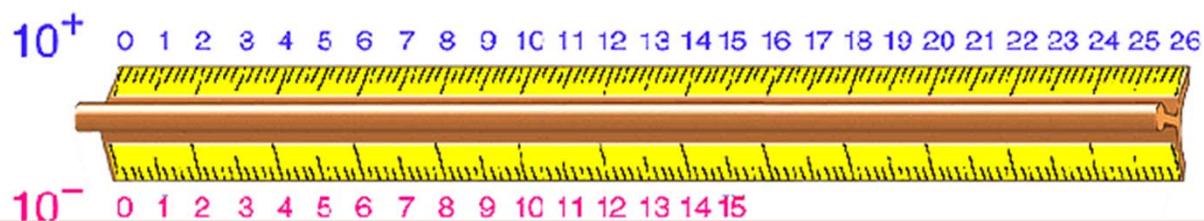


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$10^{12}$  metres = 1 000 000 000 000 metres



The orbits of the inner four planets : Mercury, Venus, Earth and Mars. All four have rocky crusts and metallic cores.



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**$10^0$  metres = 1 metre**

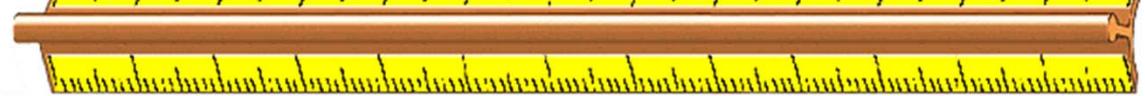


Your journey begins in the garden of the Microcosm visitor centre. This is the scale we know best - our own. Zoom in and out in powers of ten using the ruler.

$10^+$  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26



$10^-$  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



Internet

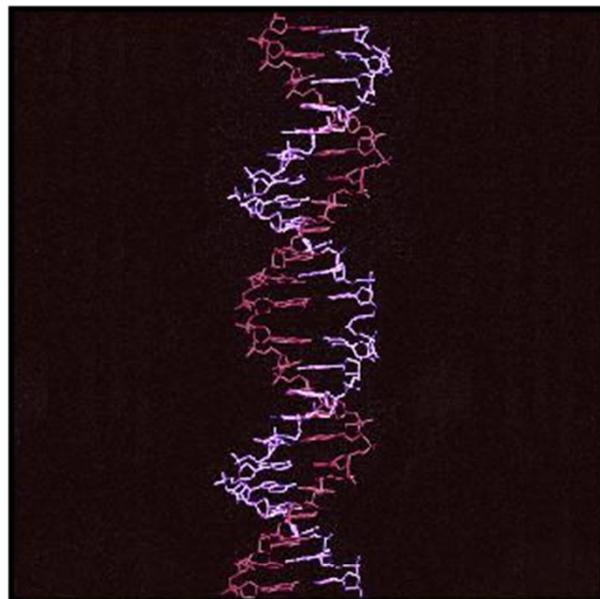


# POWERS OF TEN



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$$10^{-8} \text{ metres} = 0.000\ 000\ 01 \text{ metres}$$



At the centre of the cell is a tightly coiled molecule called DNA. It contains the genetic material needed to duplicate the fly.



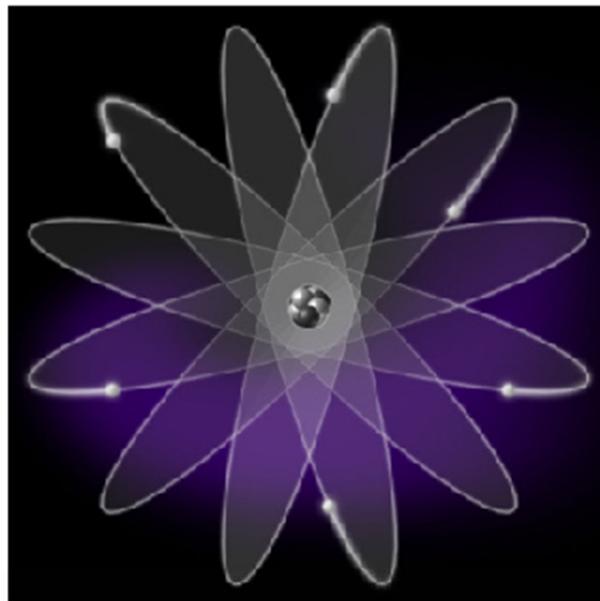


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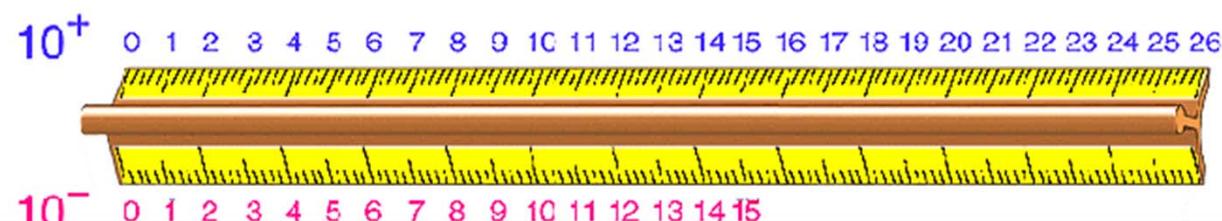
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$$10^{-10} \text{ metres} = 0.000\ 000\ 0001 \text{ metres}$$



The carbon atom, an essential ingredient for life, is mostly empty space. A cloud of six negatively charged electrons orbits the positively charged nucleus.

From  $10^{-10}$  m to  $10^{-13}$  m not much changes.



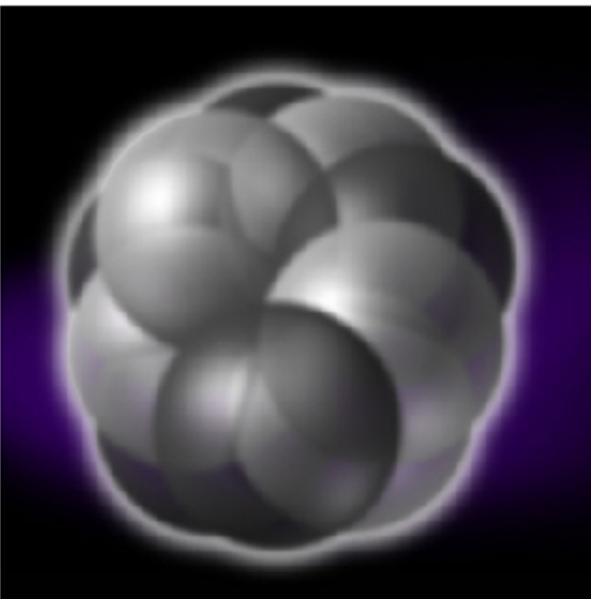
P-14 - Microsoft Internet Explorer

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Endereço <http://microcosm.web.cern.ch/microcosm/P10/english/P-14.html> Ir Links »

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$10^{-14}$  metres = 0.000 000 000 000 01 metres



At the centre of the carbon atom is a nucleus made of six protons and six neutrons. 99.95% of the mass of the atom is concentrated in this tiny space.

$10^+$  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26



$10^-$  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

<http://microcosm.web.cern.ch/microcosm/P10/english/P-14.html> Internet

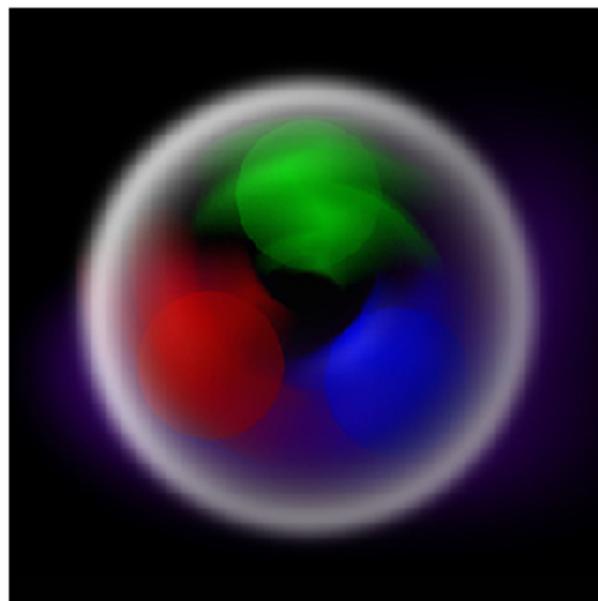


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$10^{-15}$  metres = 0.000 000 000 000 001 metres



Protons and neutrons in the nucleus are made of 3 quarks.  
Quark interactions are studied at CERN to learn how particles formed in the very early Universe.

