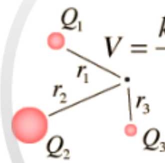
Electric Potential

Superposition

interaction is independent of other charges

allows solution of multicharge problems

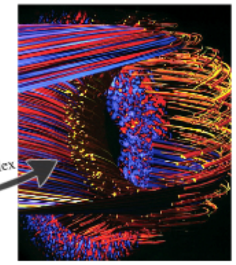


$$V = \frac{kQ_1}{r_1} + \frac{kQ_2}{r_2} + \frac{kQ_3}{r_3}$$

YAY!

because the electric potential (V) is a scalar there is no vector math to worry about!!!!!!

much more complex



Equipotential Representation

basic concept is to note similarities to topographic maps which are representations of the gravitational potential

This will be explored in a separate unit since it is so important.

further abstraction of the complex abstract idea of a scalar field

more than 1 charge

Electric Potential

$$\Delta V_A = k\frac{q_{src}}{r_A}$$

this is the potential relative to some idealized place far away where we define the potential to be zero!

$$\Delta PE_{E_{AB}} = q\Delta V_{AB}$$

this is the energy stored or released as a charge travels from A to B

Operational Definition

test charge in pocket:)

measure work needed to move it from one location to another

$$\Delta V_{AB} = \frac{W_{AB}}{q}$$

this is completely analogous to the gravitational potential difference between to locations

Electric Potential near a Point Charge

$$W_F = \overline{F} \cdot \Delta\overline{x}$$

Classical Definition of "Work"

work/energy is a singularly important concept for describing the observed behavior of the universe

completely analogous to gravitational potential which is a VERY useful conceptual model

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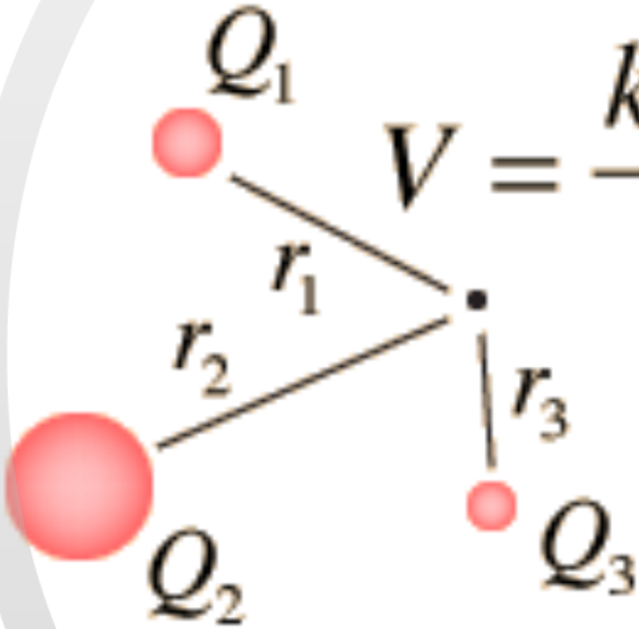

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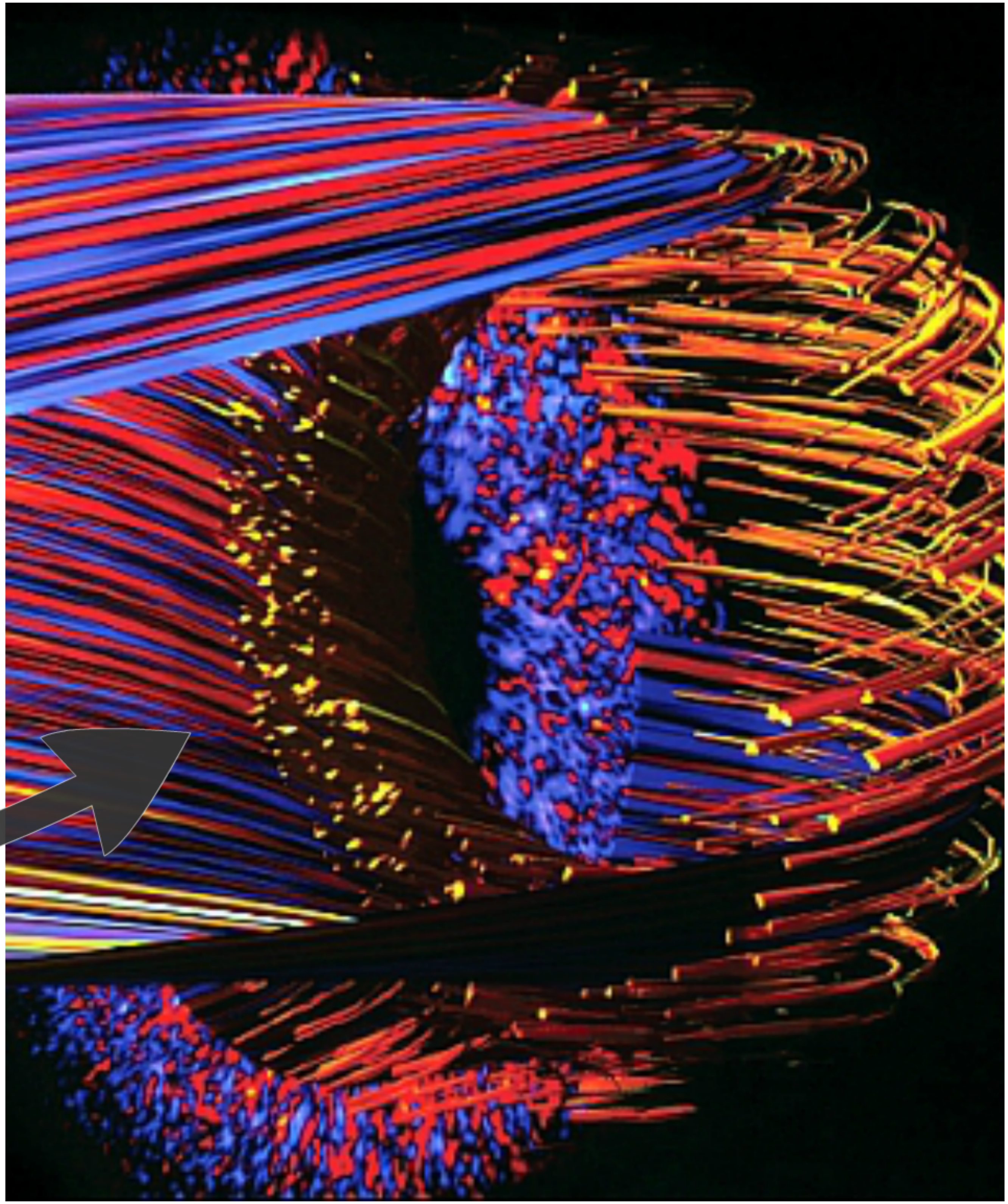

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