PH108

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1 Lecture 1 : Introduction

- G and K, the constants of Gravitation and Electrostatic Forces are called Coupling Constants when taken together
- A Physical Law is one which is true for observers from all *Frames of References*.
- Strong Force holds the Nucleus Together. Weak Force is the one responsible for Radioactivity

2 Formula from Recorded Lecture

- Pertaining to the ∇ operator:
  - $\nabla(fg) = f\nabla g + g\nabla f$
  - $\nabla(\vec{A}\cdot\vec{B}) = \vec{A}\times(\nabla\times\vec{B}) + \vec{B}\times(\nabla\times\vec{A}) + (\nabla\cdot\vec{A})\vec{B} + (\nabla\cdot\vec{B})\vec{A}$
- Those Pertaining to Divergence ($\nabla\cdot$):
  - $\nabla\cdot(f\vec{A}) = f(\nabla\cdot\vec{A}) + \vec{A}\cdot(\nabla f)$
  - $\nabla\cdot(\vec{A}\times\vec{B}) = \vec{B}\cdot(\nabla\times\vec{A}) - \vec{A}\cdot(\nabla\times\vec{B})$
- Those Pertaining to Curl ($\nabla\times$):
  - $\nabla\times(f\vec{A}) = f(\nabla\times\vec{A}) - \vec{A}\times(\nabla f)$
  - $\nabla\times(\vec{A}\times\vec{B}) = (\vec{B}.\nabla)\vec{A} + \vec{A}(\nabla\cdot\vec{B}) - (\vec{A}.\nabla)\vec{B} - \vec{B}(\nabla\cdot\vec{A})$
- **Curl of Curl:** $\nabla(\nabla\cdot\vec{A}) - \nabla^2\vec{A}$

3 Lecture 2:

Nothing Extra as such, apart form Lecture Slides!