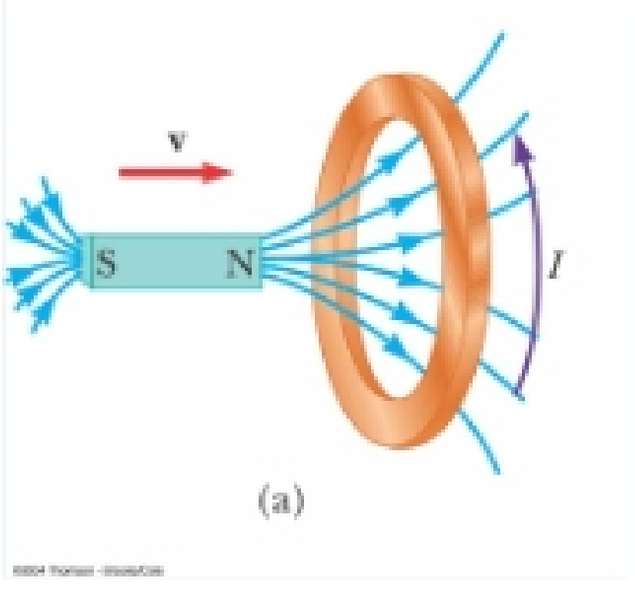
Physics 202, Lecture 16

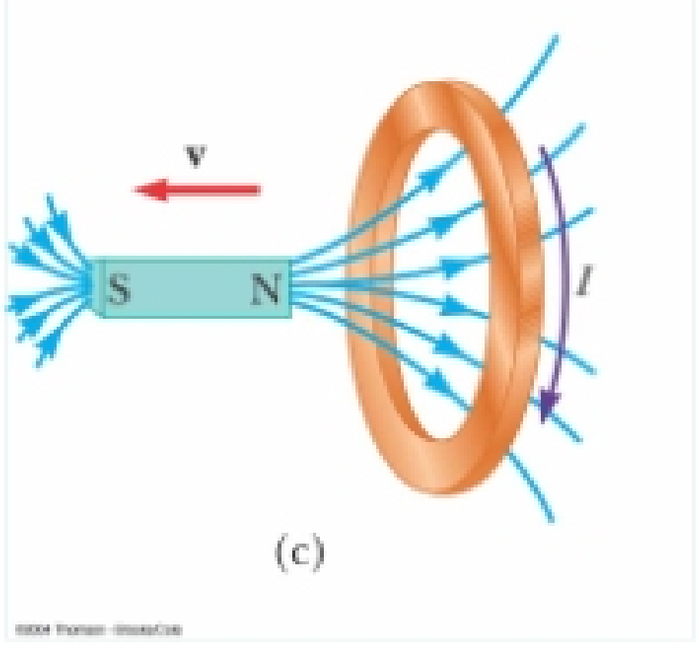
Today's Topics

- Reminder of Lenz's and Faraday's Laws
  - A Snapshot of the Maxwell Equations
  - Eddy Currents
- Forces due to Changing B are Nonconservative
- Electric Generators

Lenz's Law (Reminder)

- The emf due to change of magnetic flux tends to created a current which produces a magnetic field to compensate the change of original magnetic flux.
  - Note: Real current may or may not generated.
  - Lenz's law is a convenient way to determine the direction of the emf due to magnetic flux change.

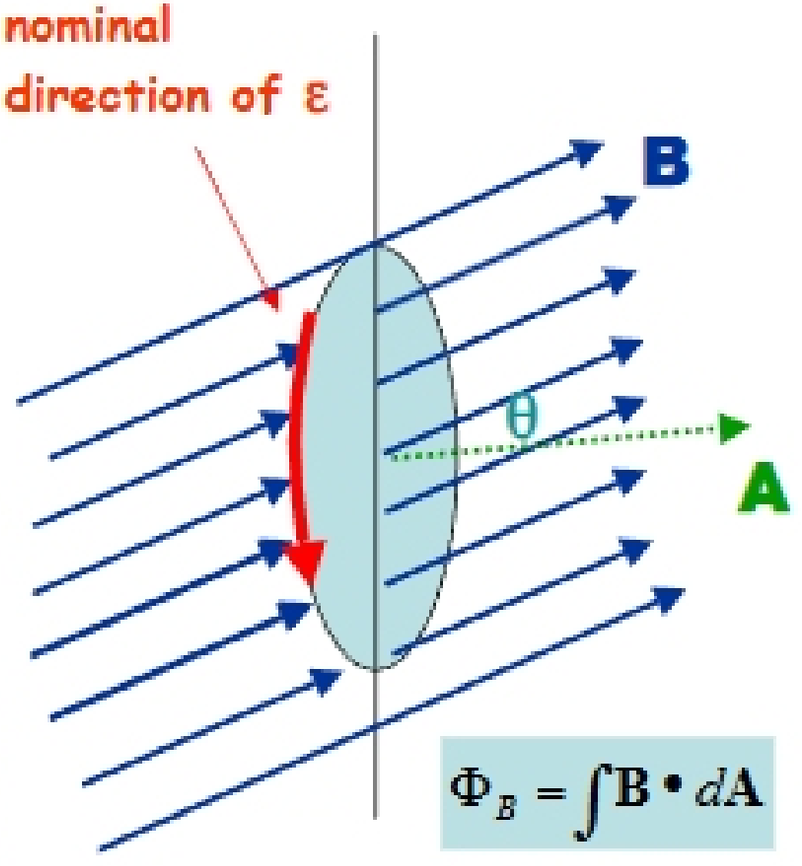




Faraday's Law (Reminder)

- The emf induced in a "circuit" is proportional to the time rate of change of magnetic flux through the "circuit".

$$\mathcal{E} = -\frac{d\Phi_B}{dt}$$



- Notes:
  - "Circuit": any closed path
    →does not have to be
    real conducting circuit
  - The path/circuit does not have to be circular, or even planar