

MAGNETIC INDUCTION

Prof. Stephen Sekula

4/7/2010

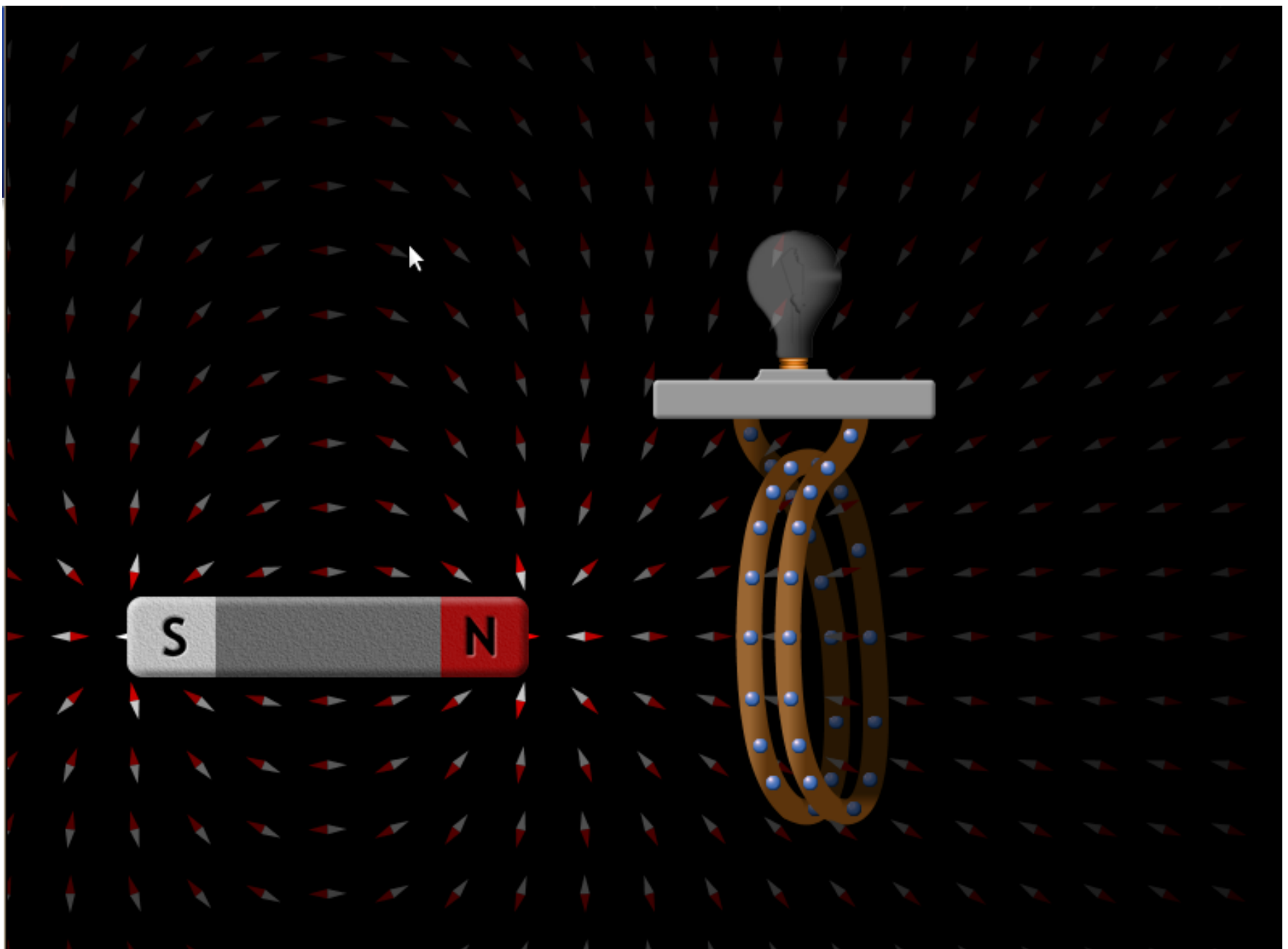
Supplementary Material for
PHY1308 (General Physics -
Electricity and Magnetism)

ANNOUNCEMENTS

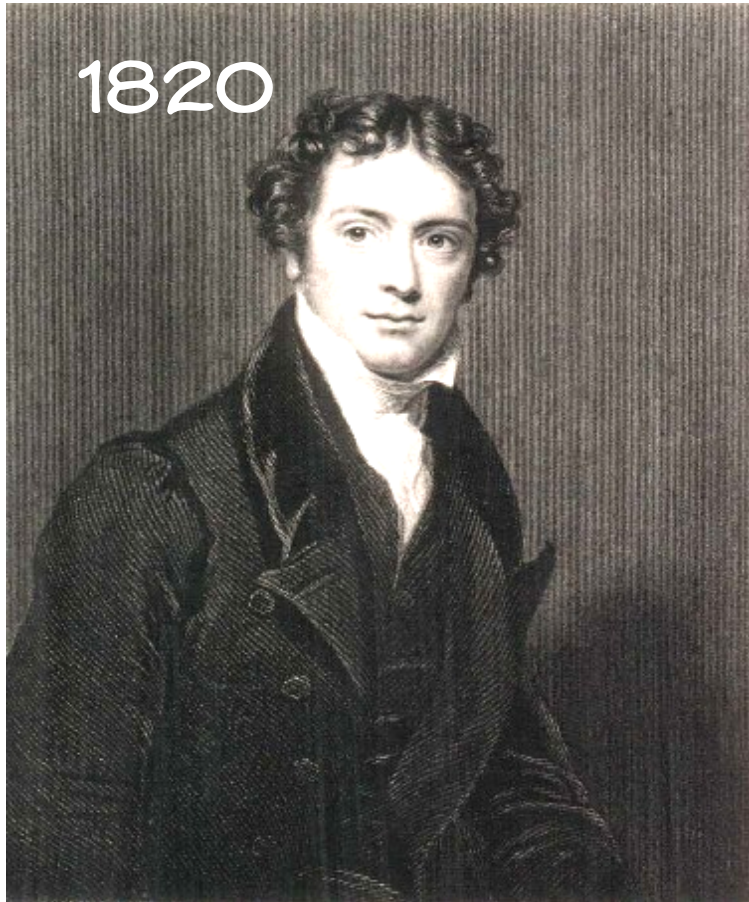
- Homework 9:
 - Due Tuesday by 9:30am
- Exam 3
 - Next Thursday, in class
 - Review session (Q&A), Wednesday from 6-7pm in FS158

Video still of recent hull breach in Southwest Airlines jet fuselage

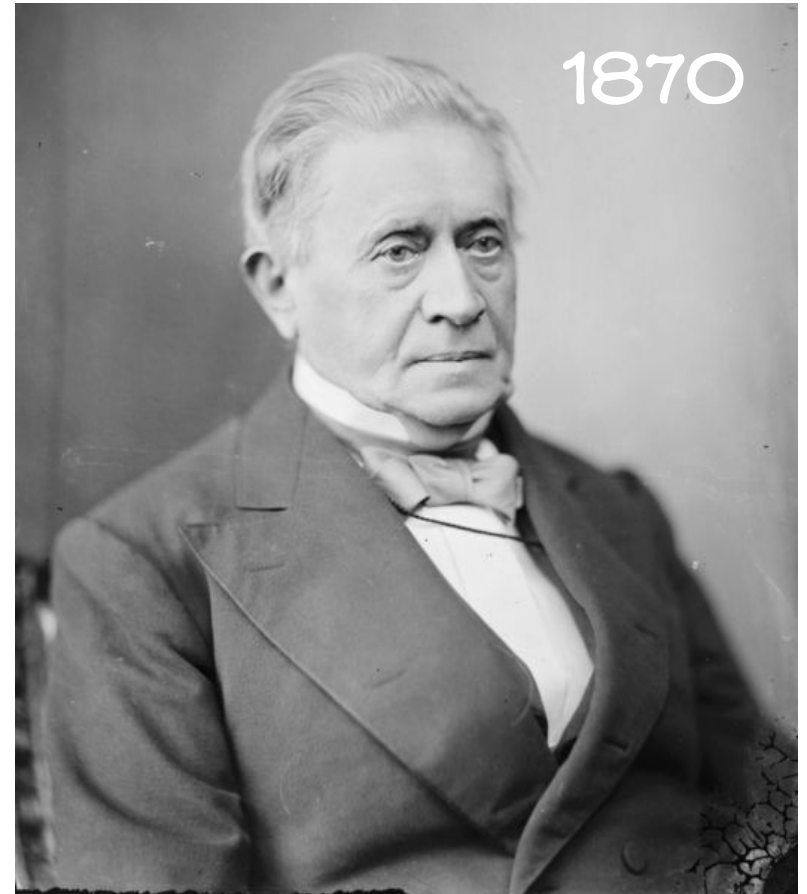




<http://phet.colorado.edu/en/simulation/faraday>



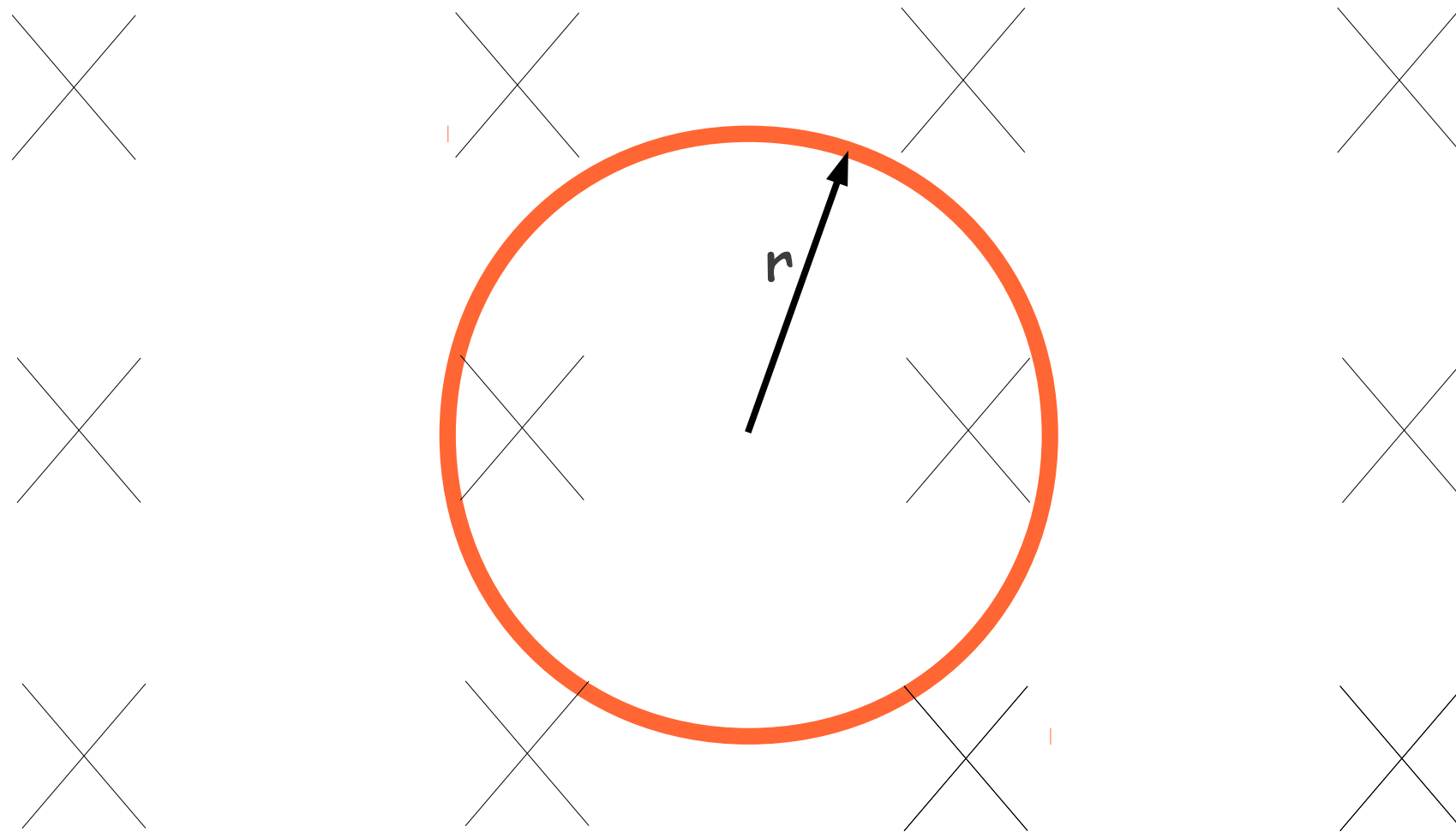
Michael Faraday
1792-1867



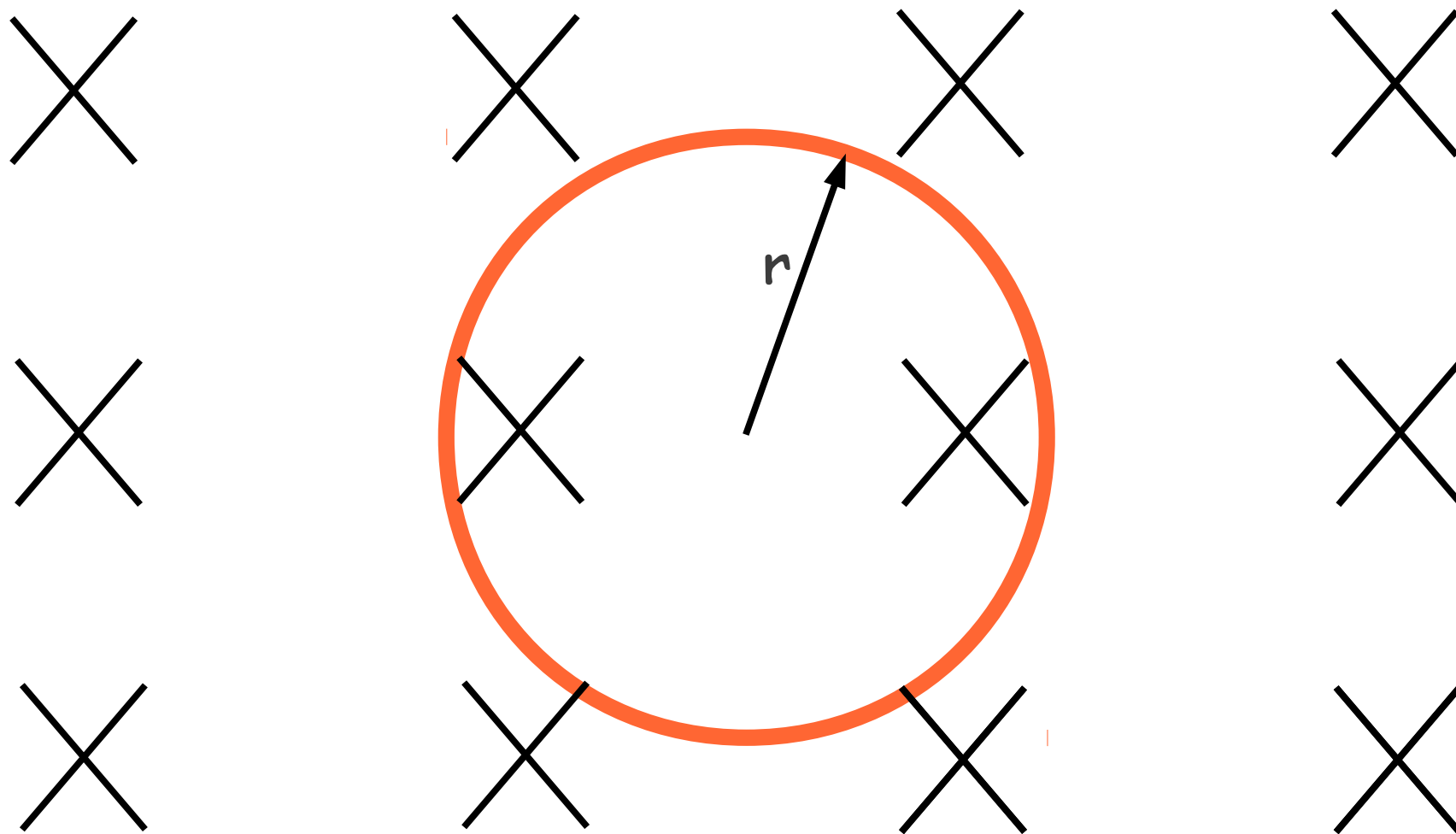
Joseph Henry
1797-1878

Both of them discovered that a changing magnetic flux induces an electric current in a conductor.

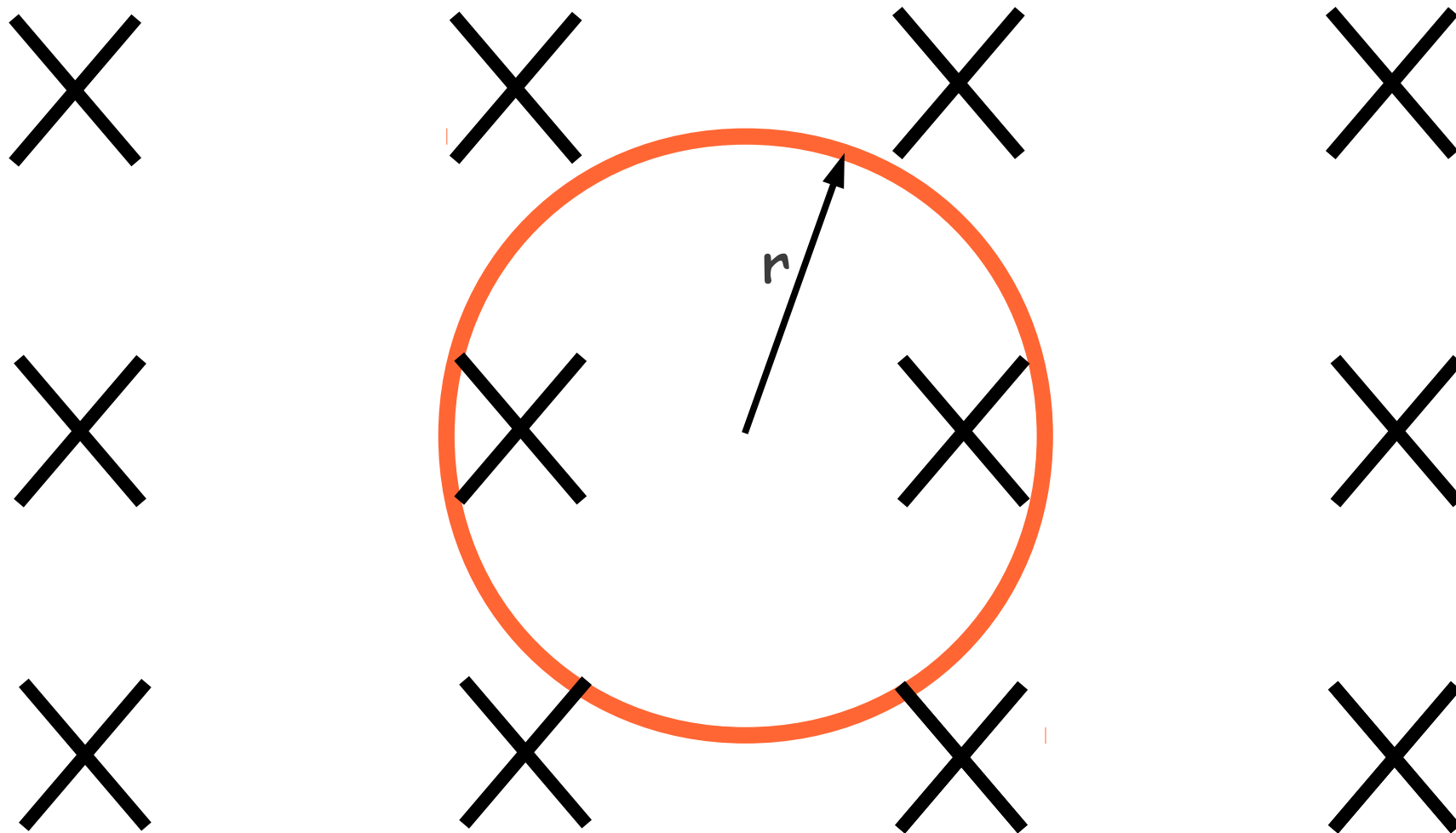
0.5 T (time = 1.0s)



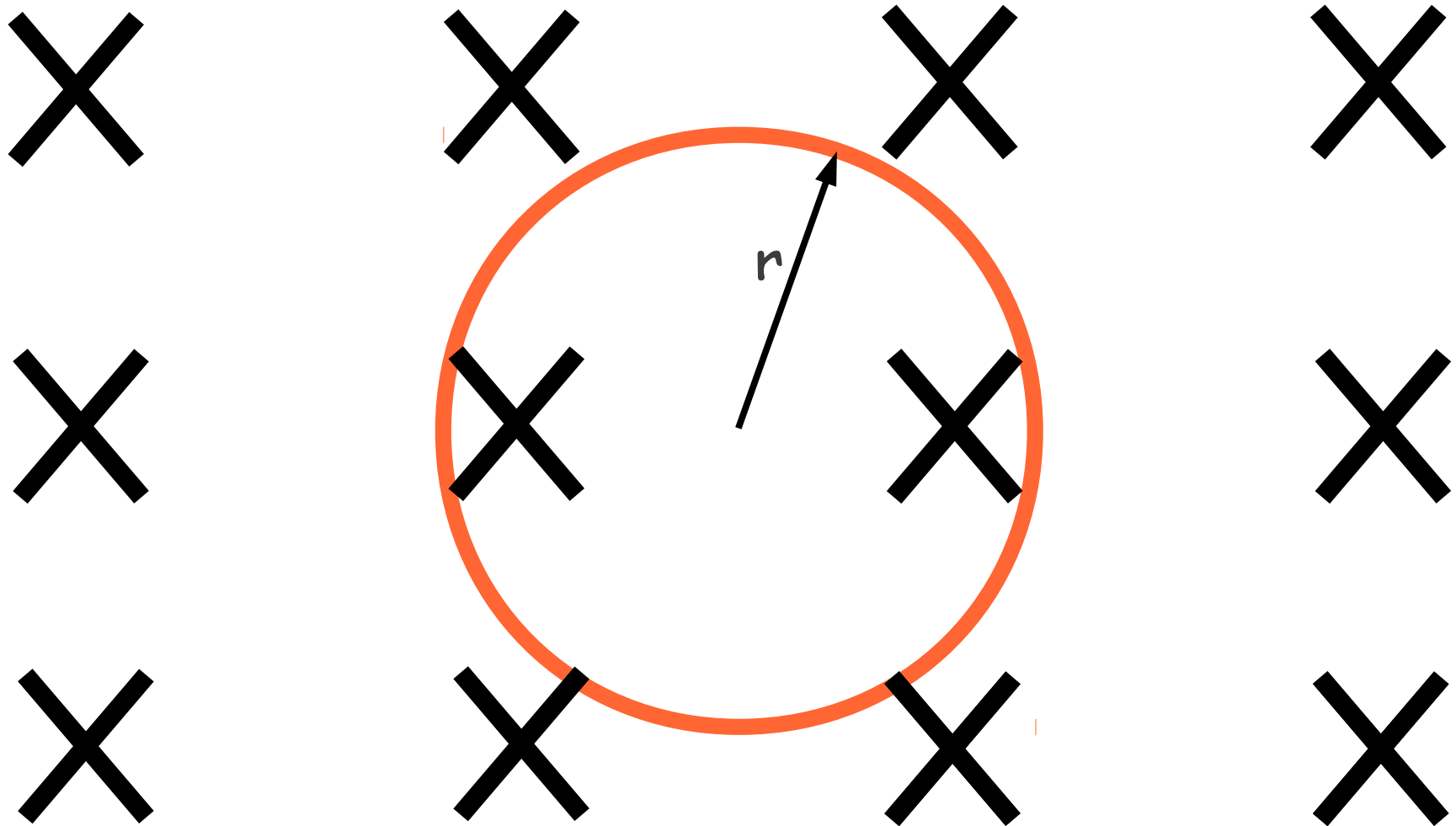
0.6 T (time = 2.0s)

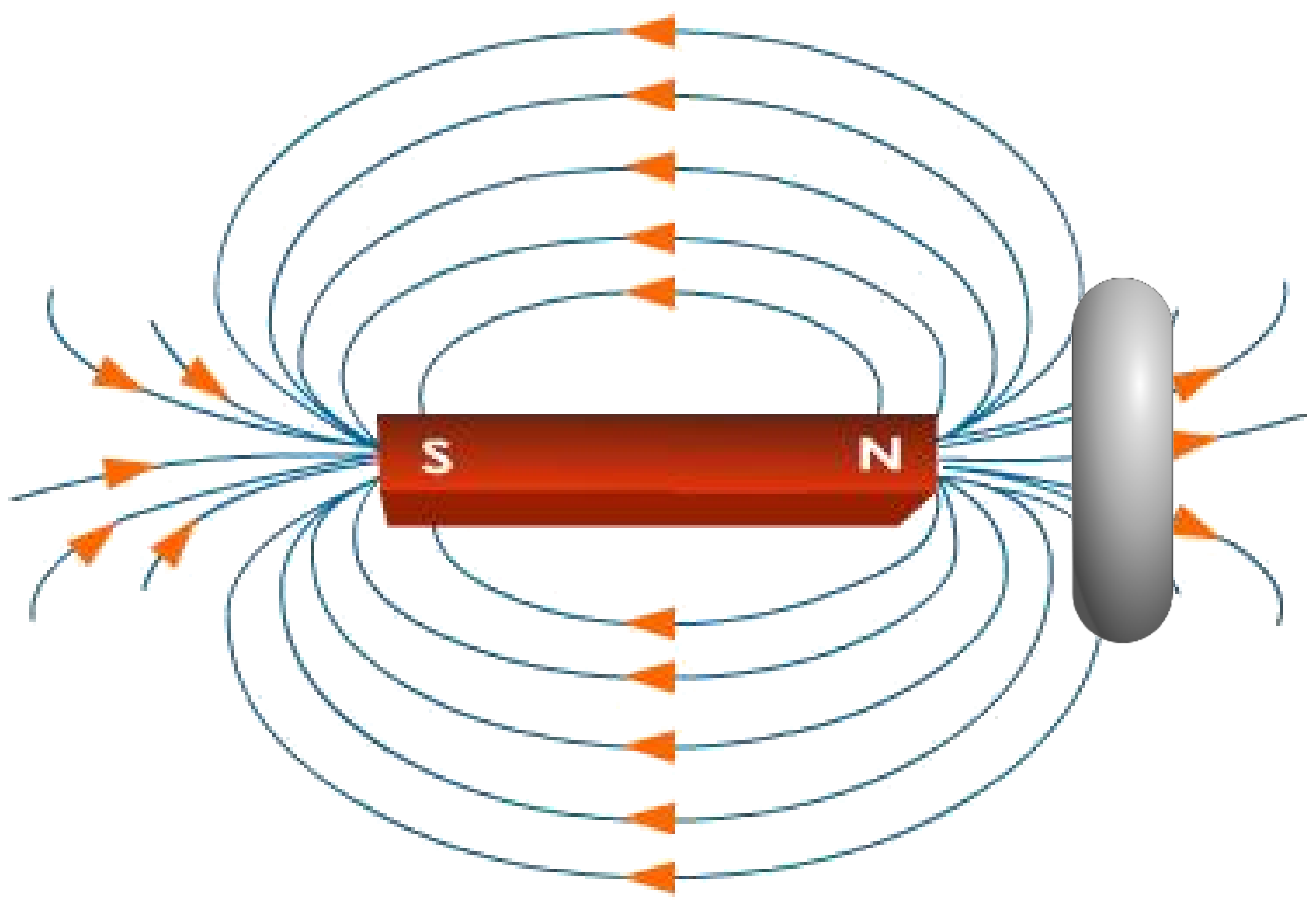


0.7 T (time = 3.0s)



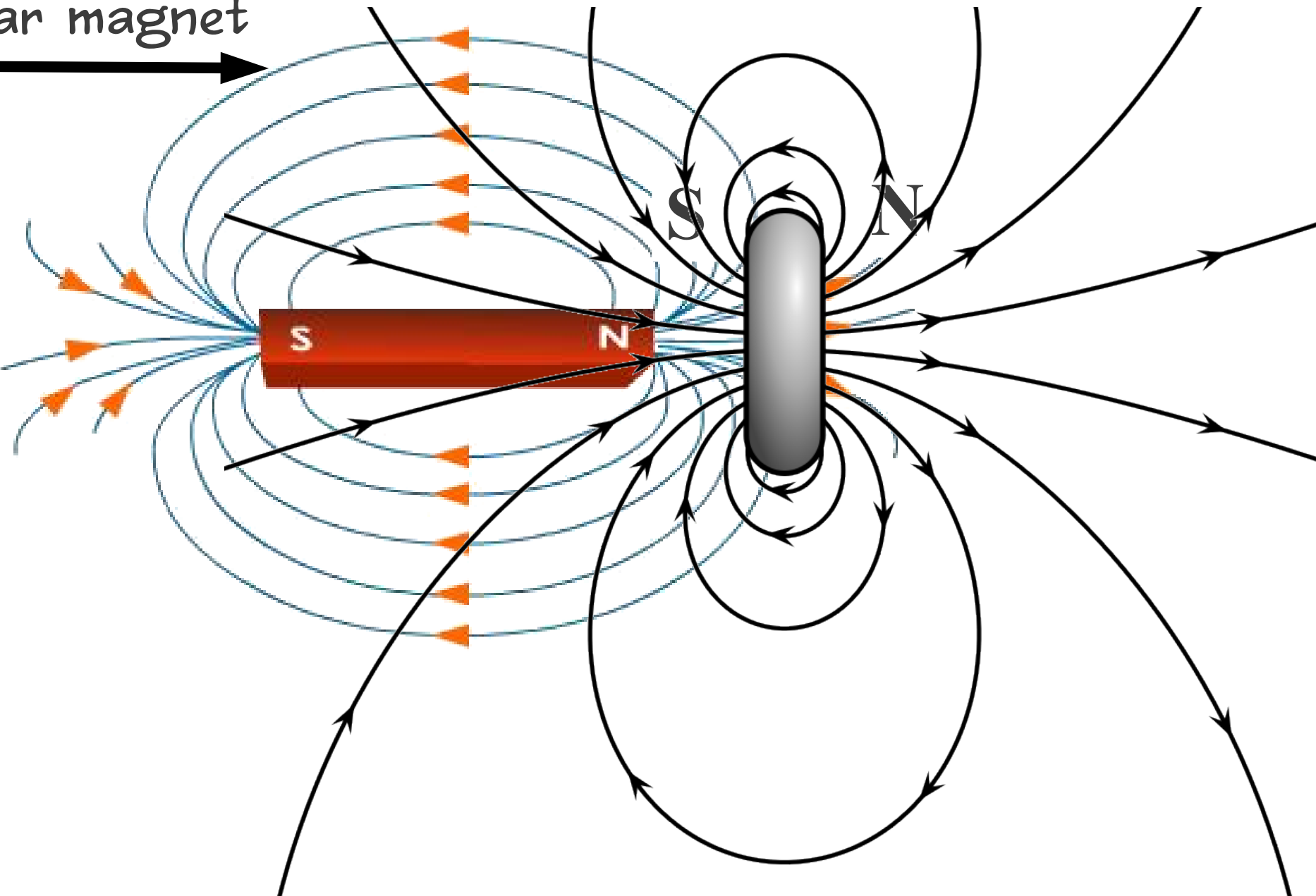
0.8 T (time = 4.0s)

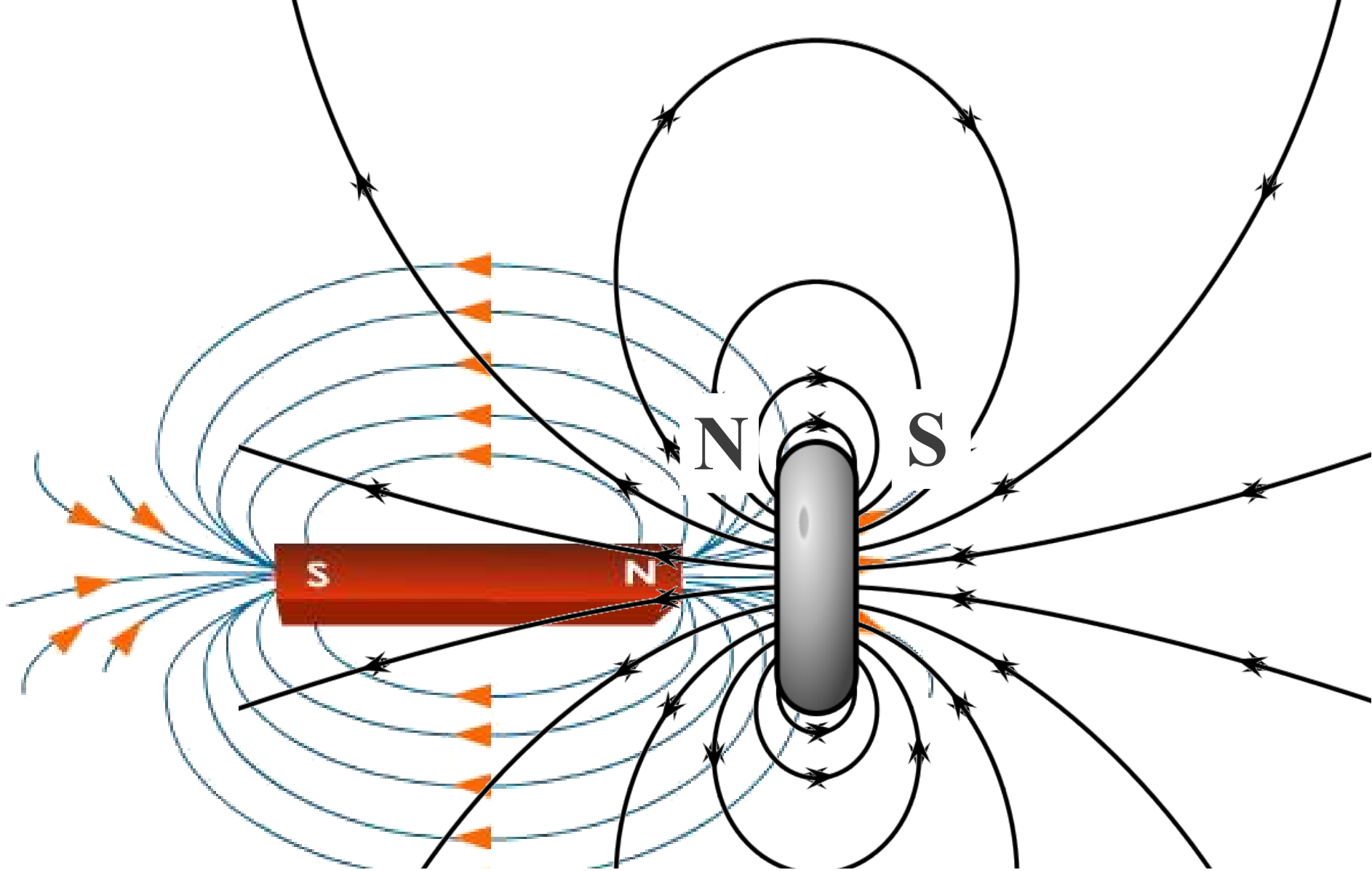




WHAT IF...

Push the
bar magnet

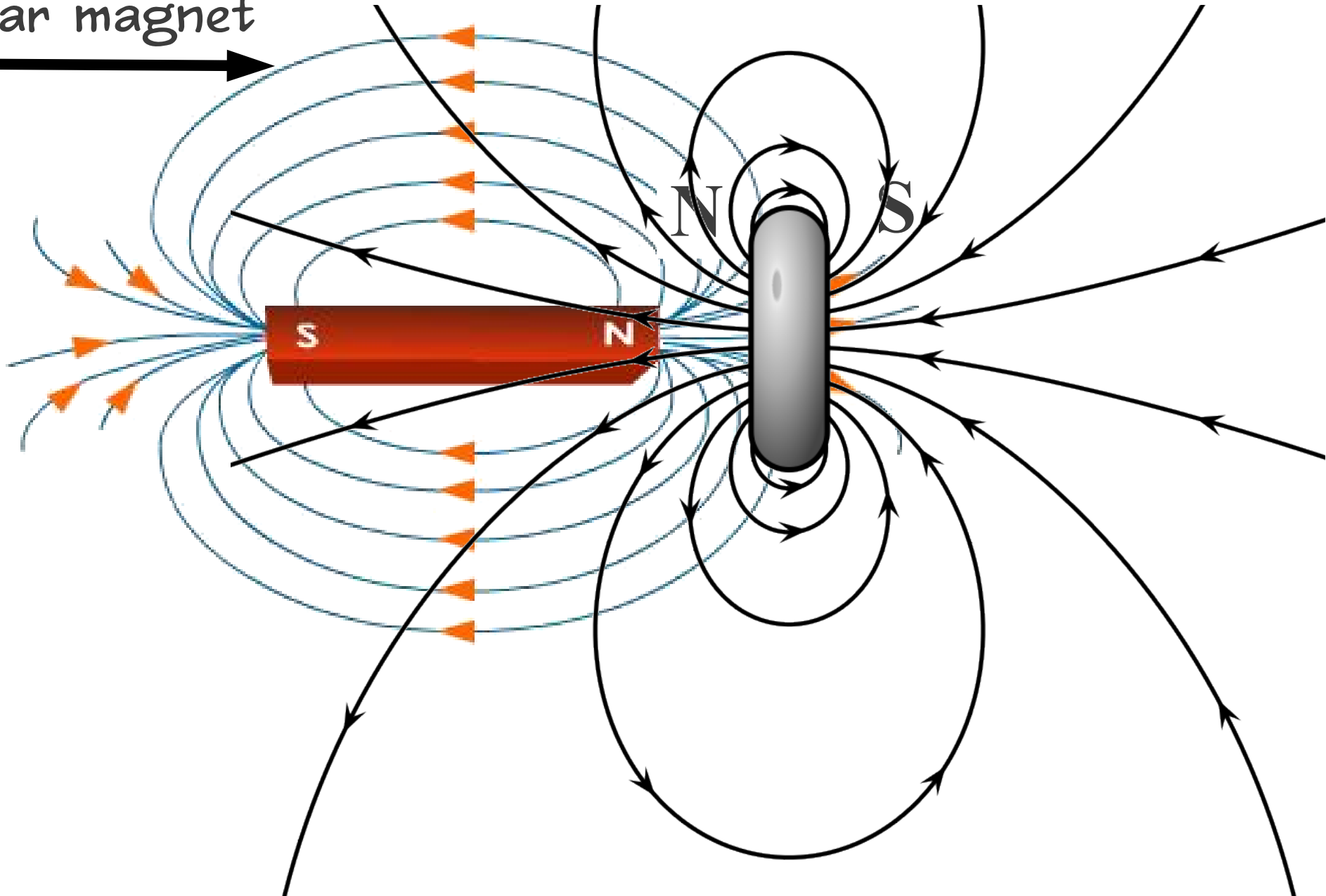


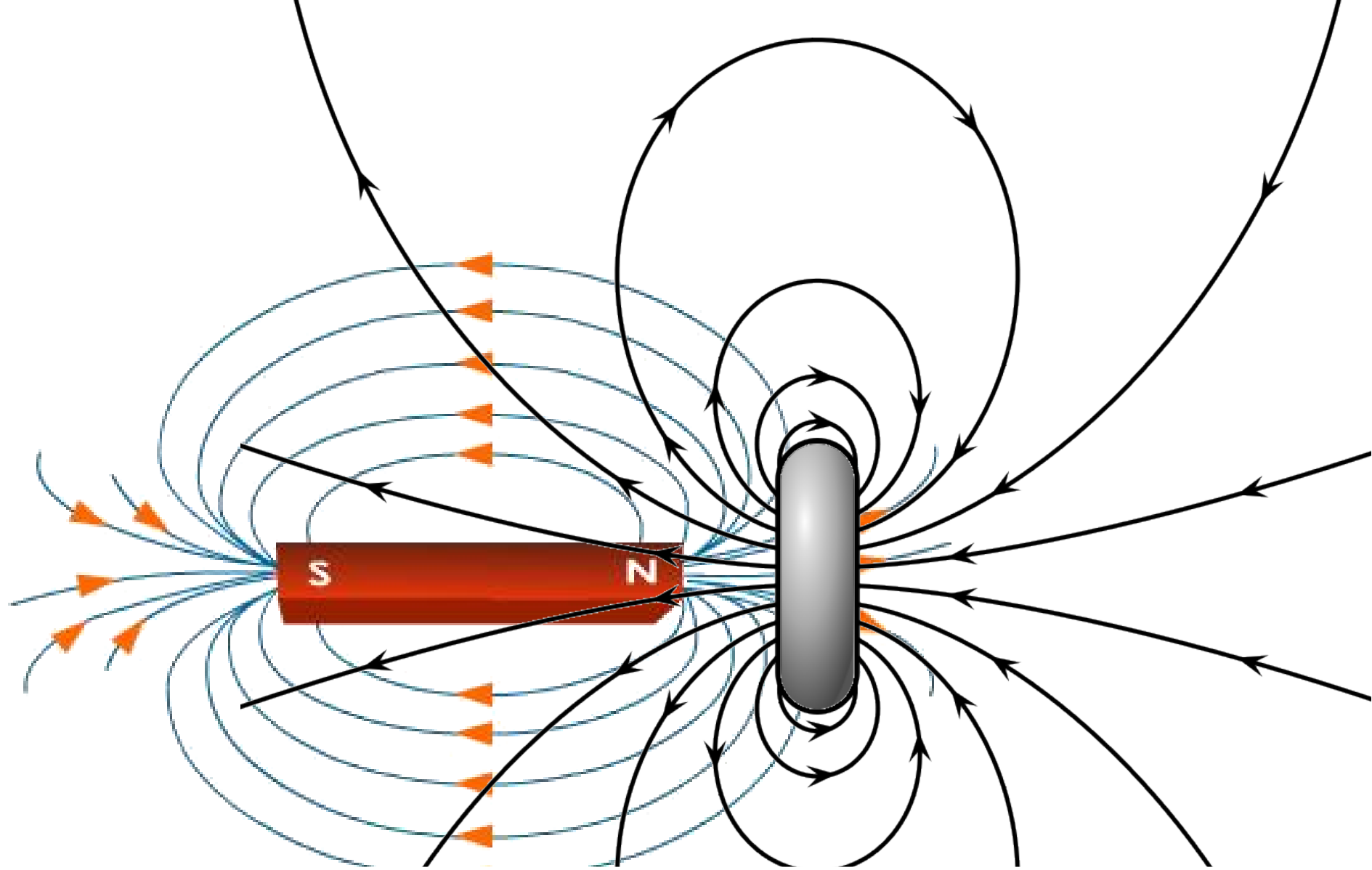


Violates conservation of energy, since the bar magnet continues to accelerate without work being done.

REALITY

Push the
bar magnet





Energy is conserved - mechanical work transformed into current in wire, which resists bar magnet and heats the wire.