

***ENEL 476***

# Electromagnetic Waves and Applications

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# 476 - Sources (charges) and fields

- If charge distribution or current changes with time, then fields also change with time.
- Fields may also act on the charges to change their distribution, which in turn changes the field.

<https://www.youtube.com/watch?v=nYkj8RVi2hc>

# Transmission lines

- At higher frequencies, standard circuit models do not apply – e.g. along a conductor (transmission line), changes in phase occur.
- Also occurs when distances are comparable to wavelength.
- <http://www.falstad.com/circuit/e-tl.html>

# Circuit boards

- Higher speeds necessitate careful analysis of propagation of signals.
- <http://www.youtube.com/watch?v=S28G5v2q1GU&NR=1>

# Antennas

- Used to launch or receive waves
- Transition between guiding structure and free space
- <http://www.met.rdg.ac.uk/clouds/maxwell/>
- [http://www.radio-electronics.com/info/antennas/parabolic/parabolic\\_reflector.php](http://www.radio-electronics.com/info/antennas/parabolic/parabolic_reflector.php)
- <https://thewirecutter.com/reviews/best-indoor-hdtv-antenna/>

# RF Heating

- <https://www.youtube.com/watch?v=HTD1aXSaGTg>
- <http://acceleware.com/rf-heating>
- 1 min

# Small antennas

- <https://www.youtube.com/watch?v=-Gn3nreCSjE&list=PLVXVJvkEq8EXJ3aaLLUV2KJRiW326nZQ5&index=17&t=0s>