Why Take the Physics GRE?

- You're applying to physics graduate school
- … and that's it.
- The test does not really evaluate your merits as a physicist or scientist
- Focuses on problem solving, calculation, basic physics
- Not the most important part of your application
- But, you might as well do as well as you can

Test Format

- No calculators allowed, only pencils
- Scratch paper and “Table of Information” provided
  100 Multiple-choice questions, 170 minutes
- ~ **100 seconds** per question
- Much of the test format requires racing this clock

Test Format: Table of Information

- Provided at exam
- Includes:
  - Constants with units
  - Powers of 10 prefixes
  - Rotational inertia
- Familiarize yourself before taking the test

TABLE OF INFORMATION

Rest mass of the electron	$m_e = 9.11 \times 10^{-31}$ kg
Magnitude of the electron charge	$e = 1.60 \times 10^{-19}$ C
Avogadro's number	$N_A = 6.02 \times 10^{23}$
Universal gas constant	$R = 8.31$ J/(mol • K)
Boltzmann's constant	$k = 1.38 \times 10^{-23}$ J/K
Speed of light	$c = 3.00 \times 10^{8}$ m/s
Planck's constant	$h = 6.63 \times 10^{-34}$ J • s $= 4.14 \times 10^{-15}$ eV • s
	$\hbar = h/2\pi$
	$hc = 1240$ eV • nm
Vacuum permittivity	$\epsilon_0 = 8.85 \times 10^{-12}$ C^2/(N • m^2)
Vacuum permeability	$\mu_0 = 4\pi \times 10^{-7}$ T • m/A
Universal gravitational constant	$G = 6.67 \times 10^{-11}$ m^3/(kg • s^2)
Acceleration due to gravity	$g = 9.80$ m/s^2
1 atmosphere pressure	1 atm $= 1.0 \times 10^5$ N/m^2 $= 1.0 \times 10^5$ Pa
1 angstrom	1Å $= 1 \times 10^{-10}$ m $= 0.1$ nm

Test Format - Topics

- Classical mechanics (20%)
- Electromagnetism (18%)
- Optics and waves (9%)
- Thermodynamics and statistical mechanics (10%)
- Quantum mechanics (12%)
- Special relativity (6%)
- Laboratory methods (6%)
- Atomic physics (10%)
- Other topics: nuclear physics, particle physics, crystals, semiconductors (9%)

Test Format

- Bad news:
  - Test covers a ton of different topics
  - Need to perform calculations very quickly
  - (Also, it's at early o'clock in the morning)
- Good news:
  - Most material relates to topics covered in the first two years
  - Only some memorization is required (eg: Maxwell's equations)
  - There are tricks for making calculations simpler that don't require special knowledge