

STA257: PROBABILITY AND STATISTICS I

UNIVERSITY OF TORONTO — FALL 2019

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1 Week 1

1.1 Stellar Parallax

1.2 The Magnitude Scale

1.3 The Copernican Revolution

1.4 Equations

2 Week 2

2.1 Orbital Mechanics

2.2 Newtonian Mechanics

2.3 Kepler's Laws of Planetary Motion

derivations

2.3.1 N-Body Orbits

2.3.2 First Law

2.3.3 Second Law

2.3.4 Third Law

3 Week 3

3.1 Tides and Moons

3.2 Equations

4 Week 3

4.1 Hydrostatic Equilibrium

4.2 The Virial Theorem

4.3 Equations

5 Week 5

5.1 Nuclear Fusion

5.2 Blackbody Radiation

5.3 Spectral Lines

quantization doppler

5.4 Light

5.5 Photon Diffusion

mfp

5.6 Equations

6 Week 6

6.1 Stellar Evolution: Pre-MS

6.2 Stellar Evolution: MS

mass, size, brightness relations

6.3 Timescales

6.4 Equations

7 Week 7

7.1 White Dwarfs

7.2 Electron Degeneracy

7.3 Equations

8 Week 8

8.1 Stellar Evolution: Post-MS

8.2 Neutron Stars

8.3 Black Holes

8.4 Equations