Material for Week 4

Physics 4488/6562: Statistical Mechanics

http://www.physics.cornell.edu/sethna/teaching/562/

Exercises due Mon. Mar 08

Last correction at January 7, 2021, 1:26 pm

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On Wednesday, you will need one or more rubber bands for the in-class activity.

Monday

In-class question: 5.4 *Black hole thermodynamics*

In-class question: 5.22 *The Dyson sphere*

Wednesday

Read: Chapter 5, Sec. 5.2.2 (Residual entropy of glasses)

Pre-class question: 5.18 *Entropy of socks*

In-class question: 5.12 *Rubber band*

In-class question: 5.23 *Entropy of the galaxy*

Friday

Read: Chapter 5, Sec. 5.3.1 (Entropy as ignorance: Non-equilibrium)

Pre-class question: 5.19 *Aging, entropy, and DNA*

In-class question: 5.13 *How many shuffles?*

Monday

Read: Chapter 5, Sec. 5.3.2 (Information entropy)

Pre-class question: 5.20 *Gravity and entropy*

Exercises for everyone (4488 and 6562)

4.4 *Jupiter! and the KAM theorem.* Hints are available in Python, Mathematica, and Matlab at http://pages.physics.cornell.edu/~sethna/StatMech/EOPCHintsAndMaterials.html or http://www.lassp.cornell.edu/sethna/StatMech/EOPCHintsAndMaterials.html

5.11 *Entropy of glasses.*

Exercises for Graduate Course (6562 only)

5.2 *Burning information and Maxwellian demons.*

5.25 *Equilibration in phase space.*

5.7 *Does entropy increase?*