

Material for Week 7

Physics 4488/6562: Statistical Mechanics

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

Exercises due Mon. Mar 09

Last correction at March 12, 2020, 4:49 pm

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NOTE: The prelim will be distributed this Friday, and will be due Monday March 9. The exercises this week are due this Friday, not Monday.

All exercises are from Version 2.0 of the text: <http://pages.physics.cornell.edu/~sethna/StatMech/v2EntropyOrderParametersComplexity.pdf>

Monday

In-class question: [7.19](#) *Many-fermion wavefunction nodes*

Wednesday

Read: Chapter 7, Sec. 7.4 (Non-interacting bosons and fermions) and 7.5 (Maxwell-Boltzmann ‘quantum’ statistics)

Pre-class question: [7.5](#) *Photon density matrices*

In-class question: [7.11](#) *Phonons on a string*

Friday

Read: Prepare for prelim

Pre-class question: [7.17](#) *Eigenstate thermalization*

In-class question: [7.10](#) *Crystal defects*

Monday

Read: PRELIM DUE

Exercises

Everyone (4488 and 6562)

[7.1](#) *Ensembles and quantum statistics.* Don’t be misled by the multiple choice format.

You will likely need to do a complete solution to answer the questions

[7.3](#) *Phase-space units and the zero of entropy.*

Graduate (6562 only)

[7.4](#) *Does entropy increase in quantum systems?*