**Resources on Statistical Mechanics (Part-1)**

1. David Tong: Lectures on Statistical Physics

<https://www.damtp.cam.ac.uk/user/tong/statphys.html>

Unit 1- The Fundamentals of Statistical Mechanics

<https://www.damtp.cam.ac.uk/user/tong/statphys/one.pdf>

Unit 2 Classical Gases

<https://www.damtp.cam.ac.uk/user/tong/statphys/two.pdf>

Unit 3 Quantum Gases

<https://www.damtp.cam.ac.uk/user/tong/statphys/three.pdf>

1. Statistical Physics- David Tong

Example Sheet 1: Ensembles

<http://www.damtp.cam.ac.uk/user/tong/statphys/omg1.pdf>

Example Sheet 2: Classical and Quantum Gases

<http://www.damtp.cam.ac.uk/user/tong/statphys/omg2.pdf>

Example Sheet 3: Bosons and Fermions

<http://www.damtp.cam.ac.uk/user/tong/statphys/omg3.pdf>

1. [Statistical Mechanics](https://www.youtube.com/watch?v=8xRFqrNyJCg&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl) – [NPTEL-NOC IITM](https://www.youtube.com/channel/UCYa1WtI-vb_bx-anHdmpNfA)

<https://www.youtube.com/playlist?list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl>

# Lecture 09- Entropy and Probability

<https://www.youtube.com/watch?v=rvazuzIH3lM&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=9>

# Lecture 10-Entropy Maximization

<https://www.youtube.com/watch?v=KRqKpEpkTlM&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=10>

# Lecture 14-Microcanonical Ensemble

<https://www.youtube.com/watch?v=VIVGP_IskQg&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=14>

# Lecture 15-Two Level System (Microcanonical Ensemble)

<https://www.youtube.com/watch?v=wZUMgLBReEY&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=15>

# Lecture 16-Classical Ideal Gas (Microcanonical Ensemble)

<https://www.youtube.com/watch?v=zUp0D5Xcigs&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=16>

# Lecture 17-Entropy of Mixing

<https://www.youtube.com/watch?v=ygX6hpFOr-s&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=17>

# Lecture 18-Classical Ideal Gas (Canonical Ensemble)

<https://www.youtube.com/watch?v=3KM-IBkBKFQ&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=18>

# Lecture 19-Gibbs Canonical Ensemble

<https://www.youtube.com/watch?v=Y7sSpfnpq6g&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=19>

# Lecture 20-Canonical Ensemble

<https://www.youtube.com/watch?v=D2CFNx8Bxq4&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=20>

# Lecture 21-Classical Ideal Gas (Gibbs Canonical Ensemble)

<https://www.youtube.com/watch?v=IWXHaw584fs&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=21&pbjreload=10>

# Lecture 22-Two Level System (Canonical Ensemble)

<https://www.youtube.com/watch?v=Xe8caPm6wAM&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=22>

# Lecture 23-N Spins in a Uniform Magnetic Field

<https://www.youtube.com/watch?v=IEpfEtZBPW8&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=23>

# Lecture 24-Grand Canonical Ensemble

<https://www.youtube.com/watch?v=_1svGr2Ad3Q&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=24>

# Lecture 25-Ideal Gas (Grand Canonical Ensemble)

<https://www.youtube.com/watch?v=OWZVL1vU_WM&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=25>

# Lecture 26-N Non - Interacting Spins in Constant Magnetic Field

<https://www.youtube.com/watch?v=qiBpbr-aOMc&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=26>

# Lecture 27-Quantum statistical mechanics

<https://www.youtube.com/watch?v=CefOcjpUP-A&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=27>

# Lecture 28-Statistics of Fermions and Bosons

<https://www.youtube.com/watch?v=JywJhiCYsy0&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=28>

# Lecture 29-Quantum to Classical Correspondance

<https://www.youtube.com/watch?v=DQlUmFddJPA&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=29>

# Lecture 32 Free Electrons(Fermi Gas) in a Metal

<https://www.youtube.com/watch?v=IDnBhKJmnbo&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=32>

# Lecture 33 Free Electrons(Fermi Gas) in a Metal(Continuation)

<https://www.youtube.com/watch?v=qnepYW11qas&list=PLyqSpQzTE6M9iXvWVCopr67kKt61ntzIl&index=33>

1. Statistical Physics:*Michael Cross, Caltech*

<http://www.pmaweb.caltech.edu/~mcc/Ph127/a/index.html>