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What do I have to do to pass the course?

Main exam (June 3rd): 24 pts (80%, 60%, 40%)

Labs: 4 labs one report. Questions about the labs will appear on the main exam!
Labinfo 28/4 (“mandatory”)

Tests: (19/3 & 16/4) A chance to earn 2+2 bonus pts on the main exam.
Example 1: Quasicrystal, a structure that is ordered but not periodic

Nobel prize 2011, Prof. Dan Shechtman

10-fold symmetry?! “there can be no such creature”
Penrose tiles (1974)  Medieval Islamic architecture

Ratio of blue/green ➔ 1.6180339...

Darb-I imam shrine Isfahan, Iran, built in the 1600s
A few general properties

- Resilient to corrosion
- Non-sticky surfaces
- Bad conductor of heat and electricity
- Hard (fracture easily)

A few applications

- Steel alloys (Sandvik)
- Solar absorbers
- Thermo electric materials
- Low-energy LEDs
- Coating in frying pans
Example 2: Graphene, the first truly 2D crystal
Nobel prize 2010, A. Geim & K. Novoselov
A few general properties

- Transparent to visible light (up to 98%)
- Good conductor of heat and electricity
- Strong and dense

A few imaginable applications

- Flexible electronic devices
- Conducting plastics
- Nanosensors
What are we going to learn in this course?

- Statistical physics
- Quantum mechanics
- Thermodynamics
- Electrodynamics

Solid State Physics