

There are many interesting topics in condensed matter physics that we will not be able to cover. This project gives you the opportunity to choose one and study it in some detail.

The end result should be a paper ~5-8 pages long that explains the topic from scratch up to the point where it gets really interesting to somebody with your level of knowledge (e.g. your class mates), covering both theoretical and experimental aspects. It should start at about a Scientific American/ Physics Today level and then get more specific, trying to make contact with topics in the course as much as possible. Don't try to cover everything about the topic, rather concentrate on what you find most interesting and make sure you understand what you say and make it understandable to the reader.

Credit for this project will be up to 20% of course grade .

You can do electronic searches for references on the topics below.

Good places to look are the Websites of

Scientific American

<http://www.sciam.com/>

or **Physics Today**

or

Science Magazine

<http://www.sciencemag.org/>

or

ISI Web of Science

<http://portal.isiknowledge.com/>

If you cannot find references to the topic you are interested in, email me and I can try to send some to you.

List all references at the end of the paper and refer to them in the paper as needed. You should not use other people's words but your own in writing your paper; any full sentence or sentence part that is substantially identical to that found in any other place will make your paper not acceptable.

Possible topics and a reference are given below . If you need more help with references consult me in office hours. You may also choose a topic not on this list with my consent .

Individual work is expected. Please send me an email with your chosen topic as soon as possible. Since I would like to have a variety of topics I will ask you to pick another one if several people pick the same topic. After you have started and looked at some references you should consult with me to make sure you are on the right track.

Suggested Topics:

Nanoscience/Nanotechnology

Carbon Nanotubes

Multilayers

Charge and Spin Density Waves

Ultrasonics

Magnetic Recording

Liquid Crystals

Quasicrystals

Synchrotron Radiation in Materials Science

Protein Crystallography

Neutron Scattering studies of Phonons