

Below are some suggested topics, but you can choose any nanoscience and nanotechnology-related topic you like, just not too close to your research (so it's not a copy-paste of your MS write-up). By the end of week 3, please let me know what topic you chose. For fresh literature updates, you could use Web of Science (go to OSU library -> databases -> Web of Science and do a keyword search). The most readable papers are probably those published in Nature, Science, and Physical Review Letters. In your paper, please include both background information and results from several newer papers, to illustrate where the field is going, what new developments have been achieved, what research problems are of interest, etc. The structure of the paper should be similar to the following:

- 1) Title/Author
- 2) Abstract
- 3) Introduction: motivation, brief overview of the field
- 4) Theoretical background: physical principles behind the phenomena you are describing
- 5) Key experiments and results: application of the method to physical problems
- 6) Discussion: status of the field, challenges, outlook
- 7) Summary
- 8) References

Examples of topics:

Semiconductor nanostructures: transport, optical properties, ultrafast spectroscopy, etc.

Polariton, magnon, and other quasiparticles in nanostructured materials

(Opto)electronic devices based on semiconductor nanostructures

Plasmonic nanostructures: properties and applications

Optical interactions in nanoscale environments

Nanophotonics in biological applications

Molecular electronics

Graphene and carbon nanotubes: properties and applications

Super-resolution imaging techniques

Novel electron spectroscopy techniques