

## **Research. Niels Egede Christensen.**

### **Theoretical solid state physics.**

Electronic band structures, optical, structural, magnetic and mechanical properties of materials. High-pressure physics, pressure-induced structural transformations, transition to superconducting phases (in light alkali metals, for example).

The *ab initio* quantum mechanical calculations are based on the Density-Functional Theory (DFT) in its local approximation (LDA). Optical properties are derived with methods beyond LDA: Gap adjustments in semiconductors by adding particular external potentials, and by applying GW methods. Electron-hole correlations, excitons, are calculated by solving the Bethe-Salpeter equation (BSE).

For details, see the list of publications:

<http://www.phys.au.dk/~nec/publ.htm>

... or as PDF file:

<http://www.phys.au.dk/~nec/publ.pdf>