I thank my supervisor Professor Tim Wehling for allowing me to get a glimpse into the fascinating research he and his research group do and for the opportunity to learn a lot about condensed matter in the past 5 months.

I also thank Michael Winter and Jan Berges for direct support, scripts, data, LATEX templates and much more as well as the whole group "Computational Condensed Matter Theory" for welcoming me into their open and productive atmosphere.

I thank all developers of free software, especially the ones I used in this thesis: QUANTUM ESPRESSO, LATEX, PYTHON, NUMPY, MATPLOTLIB, GIT.

I thank my family for support through my all my studies up until now.

I especially thank Liv for massive amounts of love and support during the writing of this thesis.