

Nanocomposite Thermoelectric Materials Theory

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Abstract

Thermoelectrics are a promising area of materials research recently revitalised by the introduction of nanocomposites. In this project, we aim to derive a theoretical mechanism, through which new, high efficiency thermoelectric materials can be designed. This will involve a detailed understanding of the fundamental theories of solid-state physics, of which the phonon model plays a critical role. This theoretical project aims to guide experiment, keeping within practical limits and computationally modelling potential designs.

1 Introduction

1.1 Motivation

Energy and its use defines human society. Throughout human history we have seen an upwards trend of energy consumption and with it we are able to transform our environment and our lives.

Thermoelectric materials have the potential to revolutionise our energy harvesting methods due to their ability to convert heat directly into electricity.

1.2 Investigation

1.3 Approach

2 Background

2.1 Kinetic Theory

Assumptions

3 Specfics

3.1 Thermoelectric Theory

Assumptions

4 Results and Analysis

5 Conclusion and Potential Development

<https://github.com/kahlos/thermoelectrics>

References

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