

高性能熱電材料の創成と量子ビーム解析

High performance thermal electricity

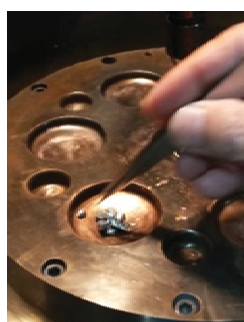
~ creation and analysis using quantum beam ~

概要

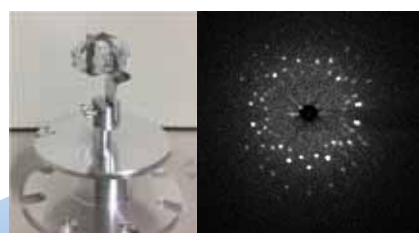
高効率の熱電材料の創成には、基礎となる結晶構造、電気伝導率を向上させるための電子状態、熱伝導度を低下させるための格子ダイナミクス、の3つの理解と制御が鍵である。量子ビームを用いた微視的な物性評価を結びつけることにより、熱電材料基礎研究の推進力を高めスピード化を目指す。

Creation of high performance thermal electricity material needs to understand and control three microscopic properties, crystal structure, electronic state, and lattice dynamics. We will propose powerful and efficient study of electric thermal materials by combination material creation and evaluation of microscopic properties .

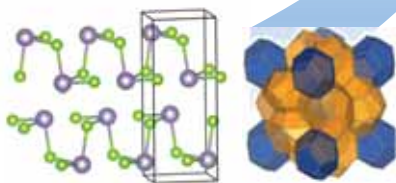
Method



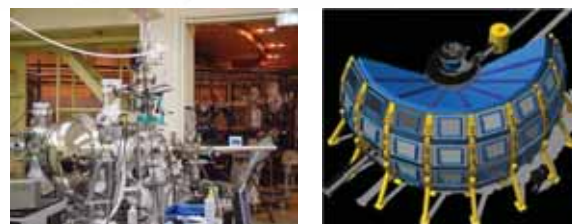
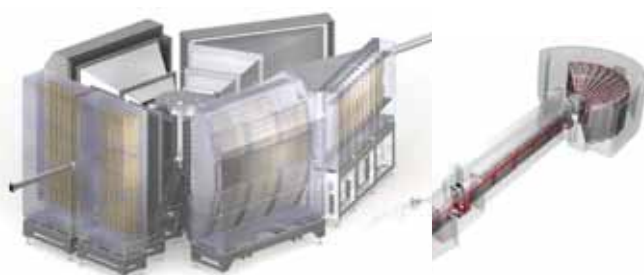
物質合成 (NIMS)



単結晶試料評価 (ISSP)



X線結晶構造解析(筑波大)

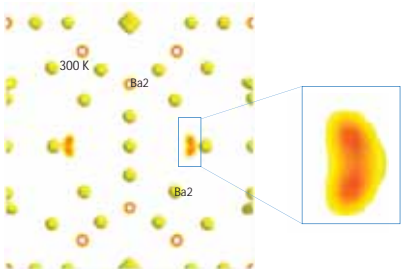
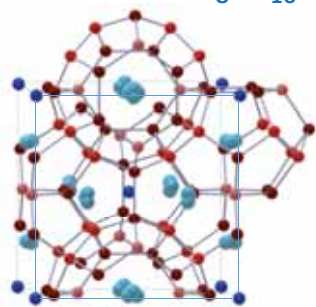


物性評価に用いたJ-PARC, PFの分光器群 (KEK, ISSP)

量子ビームを用いた物性評価

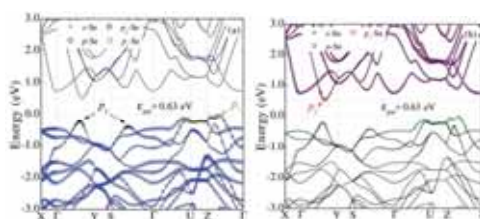
Investigation of physical properties using quantum beam

Ge-Clathrate $Ba_8Ga_{16}Ge_{30}$

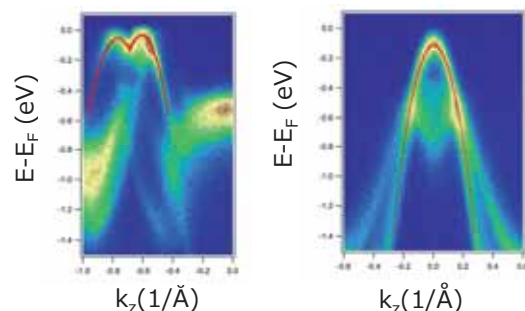


mem解析によるラットリングの観測

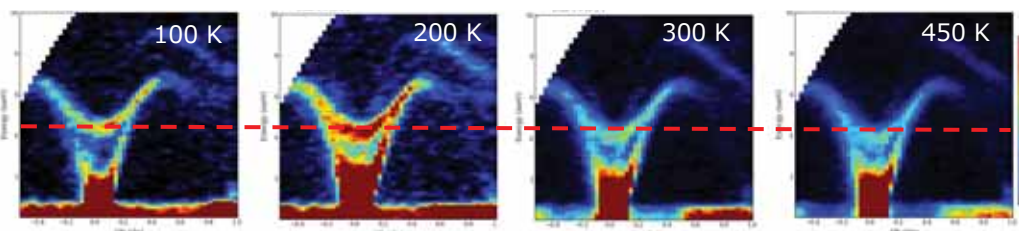
Na-doped SnSe



González-Romero RL et al., Phys.Chem.Chem.Phys., 2017, 19, 12804



ARPES測定のパノンの観測



中性子非弾性散乱のフォノン光学モードのソフトニングの観測