

**Phase Transitions, Magnetocaloric Effects, and  
Magneto Transport Properties of the  
Heusler Alloy  $\text{Ni}_{47}\text{Bi}_3\text{Mn}_{35}\text{In}_{15}$**

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**2025 February 21 Friday 4:00 PM**

**Physics Seminar in Neckers 440**

**Abstract:** In this work we investigate the magnetocaloric properties of a Heusler alloy  $\text{Ni}_{47}\text{Bi}_3\text{Mn}_{35}\text{In}_{15}$  with a focus on their structural, magnetic, and transport properties by substituting 3% Bi in Ni site. By using the X-ray diffractometer, we observe the alloy crystallized in a primitive cubic-like structure described as L21 space group with a lattice constant  $a = 5.946 \text{ \AA}$ . Magnetization measurements reveal that the alloy exhibits a first order transition from antiferromagnetic (AFM) to a ferromagnetic (FM) state at  $T_M \approx 200 \text{ K}$  and a second-order phase transition (SOPT) from (FM) to a paramagnetic (PM) at the Curie temperature  $T_C = 313 \text{ K}$  in an applied magnetic field of  $H = 100 \text{ Oe}$ . In addition, this alloy exhibits maximum magnetic entropy change of  $|\Delta S_M| = 6.0 \text{ Jkg}^{-1}\text{K}^{-1}$  and a significant relative cooling power (RCP) of  $336 \text{ J/kg}$  in the vicinity of the Curie temperature with  $H = 50 \text{ kOe}$ . The resistivity was found to exhibit a typical behavior for the Heusler alloys measured at zero field.

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