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PHS :
Dated: 26.04. 2018

TPSC SEMINAR NOTICE

SPEAKER: Prof. S. K. Dhar
Dept. of Condensed Matter Physics & Materials Science
Tata Institute of Fundamental Research
Mumbai

TITLE: Extremely large magnetoresistance in MoSi₂

DATE & DAY: 2 May, Wednesday

VENUE: Seminar Hall

TIME: 4.00 P.M.

Abstract

We have observed an extremely large positive magnetoresistance (MR) on a high quality single crystal of MoSi₂, with a residual resistivity ratio of nearly 3926. The MR approaches almost 10⁷% at 2 K in 14 T field without apparent saturation. Low field Hall resistivity data reveal an uncompensated nature of MoSi₂, contrary to a previous report in the literature, sufficient enough to cause saturation of MR in the high field regime. The analysis of magnetotransport data, however, suggests a gradual enhancement of the compensation level towards the resonant situation with increasing magnetic field. The non-saturating MR of this semimetal thus arises under the unconventional situation of field induced electron hole compensation, whereas its huge magnitude is decided primarily by the ultra large value of the carrier mobility. We have also observed the quantum oscillations associated with the magnetization (dHvA effect) and magnetoresistance (SdH effect). We infer a non-trivial Berry phase in dHvA oscillations which suggest a topological character of MoSi₂, though band structure calculations are not compatible with the picture of either Dirac or Weyl topological semimetal.

.All interested are cordially invited to attend.

Chairperson