Scanning Tunneling Microscopy study and unusual transport 
properties of the topological semimetal a-Sn. JIAWEI RUAN, Nanjing Univ 
— Weyl semimetals are new states of quantum matter with topological Weyl nodes 
near Fermi level in the bulk and Fermi arcs at the surface, which are paid a lot 
attention in recently years. Herewe report another topological semimetal a-Sn., 
which is double Weyl semimetal in the magnetic field and Dirac semimetal in an 
appropriate in-plane strain. By combing Landau level spectroscopy and quasiparti-
cle interference, we obtain the linear dispersion near the Dirac point within strain 
while quadratic band dispersion near Γpoint without strain. We also observe the 
negative longitudinal magnetoresistance (LMR) in both two system, which is caused 
by chiral anomaly. However ,the LMR profiles of strained a-Sn have a little rise and 
then descend while the unstrained one drop directly, which is due to the different 
type of Weyl semimetal and further confirm our prediction.

Jiawei Ruan
Nanjing Univ

Date submitted: 06 Nov 2015

Electronic form version 1.4