Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Singly Bonded Layered Polymeric Nitrogen (LP-N)[1] CHOONG-SHIK YOO, DANE TOMASINO, MINSEOB KIM, Washington State Univ, JESSE SMITH, HPCAT/APS, Geophysical Laboratory — We report the discovery of novel nitrogen phase synthesized using laser-heated diamond anvil cells at pressures well above the stability field of cg-N. This new phase is characterized by its singly bonded, layered polymeric (LP) structure similar to the predicted Pba2 and two colossal Raman bands, arising from two groups of highly polarized nitrogen atoms in the bulk and surface of the layer, respectively. The present result also provides a new constraint for the nitrogen phase diagram, highlighting an unusual symmetry lowering 3D cg-N to 2D LP-N transition and thereby the enhanced electrostatic contribution to the stabilization of this densely packed LP-N.

[1]The work has been supported by the NSF-DMR (Grant No. 1203834) and DTRA (HDTRA1-12-01-0020).

Choong-Shik Yoo
Washington State Univ

Date submitted: 05 Nov 2014 Electronic form version 1.4