

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

**Determining Modern Energy Functional for Properties of Nuclei
And Nuclear Matter** CHRISTINA LONIEWSKI, SHALOM SHLOMO, GIA-
COMO BONASERA, Cyclotron Institute, Texas A&M University — The develop-
ment of an energy density functional (EDF) for the interacting nuclear system is
very important for the study of properties of nuclei away from the valley of sta-
bility and astrophysical systems. Current literature lists over 300 EDF's based on
Skryme-type nucleon-nucleon effective interactions whose parameter sets are fixed
according to different ranges of experimental data, and most of which fail to predict
an unbound ^{28}O nucleus. I vary the parameters of Skryme-type nucleon-nucleon
effective interaction KDE0v1 using Hartree-Fock-based approximations to obtain
a new interaction KDE0v1* that leaves oxygen-28 unbound. This new interaction
KDE0v1* accomplishes this while calculating binding energies consistent with a wide
range of known nuclear masses. This will contribute predictions that can be used to
determine properties of neutron stars and the location of the neutron dripline.

Christina Loniewski
Cyclotron Institute, Texas A&M University

Date submitted: 24 Jul 2014

Electronic form version 1.4