

# Modeling atmosphere emission from neutron stars

**W.C.G. Ho** (1), G. Chabrier (2), P. Chang (3), D.L. Kaplan (1), D. Lai (4), K. Mori (5), A.Y. Potekhin (6), M. van Adelsberg (4)

(1) MIT Kavli Institute for Astrophysics and Space Research, USA

(wynnho@slac.stanford.edu), (2) Ecole Normale Supérieure de Lyon, France, (3) University of California, Berkeley, USA, (4) Cornell University, USA, (5) Canadian Institute for Theoretical Astrophysics, Canada, (6) Ioffe Physico-Technical Institute, Russia

Since their discovery, neutron stars have been recognized to be unique natural laboratories for helping our understanding of fundamental physics, including nuclear and particle physics and the theory of gravity. The excellent sensitivity of the new X-ray telescopes, e.g., Chandra and XMM-Newton, is ideal for the study of cooling, isolated neutron stars, which emit at these energies. In order to exploit the wealth of information contained in the data, a thorough knowledge of the emission properties of neutron stars is necessary. I will discuss our work on constructing models to be compared with X-ray and optical observations of these sources, especially the effects of vacuum polarization and bound atoms on the atmosphere structure and spectra.