

**PHYSICS & ASTRONOMY COLLOQUIUM
UNIVERSITY OF WISCONSIN – STEVENS POINT**

FRIDAY, November 7, 2014 at 3:00 P.M. (Room A-106 SCI)

**Atom-Light Interactions: Generating New
Coherent Light Sources**

Dr. Erik Brekke – Assist. Prof. at Saint Norbert College



About the Speaker:

I did my undergraduate studies at Gustavus Adolphus College in MN majoring in physics. My graduate work was done at UW-Madison, specializing in atomic and optical physics, with my thesis work on "Stimulated Emission Studies of Rydberg Atoms". Since my Ph.D., I have worked at Wheaton College in IL, and am now an assistant professor of physics at St. Norbert College. I have worked on many projects including exploring atom-atom interactions for possible quantum computation, single photon detection schemes, novel laser design, and physics education projects. My current work involves pursuing parametric-four wave mixing in atomic samples and new lasing possibilities.

ABSTRACT:

The laser has become both a very common and important technology. However, there are still important frequencies where effective lasers are hard to develop. In this talk I will explore one method for developing novel laser sources, called parametric four-wave mixing. By controlling the interaction of existing laser sources with rubidium atoms, it is possible to have coherent light emitted using transitions between atomic levels. The limiting factors to high power output will be discussed, as well as possible solutions. Current experiments have shown the realization of this process at 420 nm, a desirable wavelength for quantum computing.

Refreshments will be served beginning at 2:45 p.m.