



The University of Western Ontario
DEPARTMENT OF PHYSICS AND ASTRONOMY

Elizabeth Laird Memorial Lecture

FRIDAY, 30th March 2007

Reception: 5:30 p.m. – PAB 123

Lecture: 6:30 p.m. – WSC 55

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“OZONE: the Dr. Jekyll and Mr. Hyde of the Atmosphere”

ABSTRACT

From the perspective of humanity, ozone in the atmosphere has something of a “split personality.” We absolutely need ozone in the stratosphere, above about 10 km in height. Here, it absorbs dangerous ultra-violet light from the sun, and protects us from cancers and DNA damage. But ozone also exists in the troposphere, and here it is a noxious pollutant. It causes eye irritation, asthma, bronchitis, and stunts crop growth. It is a major component of photochemical smog.

Scientists have measured ozone for many years, using both ground-based instruments and satellites. One very important instrument is the ozonesonde—a small instrument launched on a weather balloon along with a standard temperature-moisture-pressure (“P-T-U”) sensor. It measures the amount of atmospheric ozone from the surface, through the troposphere, and into the middle stratosphere (~35 km altitude). The recent deployment of strategically-designed ozonesonde networks has revolutionized sampling in the UT/LS (upper troposphere-lower stratosphere)—that part of the atmosphere where interactions between ozone change and climate come together.

The SHADOZ (Southern Hemisphere ADDitional OZonesondes) tropical network <http://croc.gsfc.nasa.gov/shadoz>, operating since 1998, and the short-term IONS (INTEX Ozonesonde Network Study) mid-latitude network in 2004 and 2006, <http://croc.gsfc.nasa.gov/intexb/ions06.html>, allow us to interpret processes in this part of the atmosphere where dynamical variability, complex chemical sources and human influences interact. Important discoveries from each network will be highlighted.