



## Anthony D. Appelhans

*Basic and applied research in mass spectrometry instrumentation, methods development, and applications.*

**Phone:** 208.526.0862

**Email:** anthony.appelhans@inl.gov

### **Education**

Bachelor of Science in Engineering Physics, cum laude, Regis College, Denver, Colorado 1972.

### **Experience and Achievements**

Consulting Scientist employed at the INL since 1977; a co-principal investigator in research and instrument development programs sponsored by DOE Basic Energy Sciences, DOE National Security, DOD-US Army, DOD-US Air Force, the DOE Environmental Science Research program and the INL laboratory directed research and development office. Primary endeavors included developing new concepts in secondary ion mass spectrometry (SIMS) and isotope ratio mass spectrometry, and in designing and conducting research programs to develop these concepts into working prototypes. Invented a new concept for obtaining wide dispersion for magnetic sector isotope ratio mass spectrometry; designed and constructed the first ion trap secondary ion mass spectrometer (IT-SIMS) used for analysis of environmental samples. Co-developer of the ReO<sub>4</sub>-polyatomic ion source for use in secondary ion mass spectrometry (SIMS); recipient of 3 R&D-100 awards; instructor for invited classes in computer design of electrostatic ion lenses and transport optics sponsored by the American Society for Mass Spectrometry; member of the NSF sponsored High Precision Isotope Ratio (HIPIR) working group.

### **R&D 100 Awards**

Pulsed Extraction Secondary Ion Mass Spectrometer - 1992

SIMION Ion Optics Computer Modeling Program -1989

Neutral Molecular Beam Surface Probe 1988

## INL'S LIFETIME ACHIEVEMENT AWARD FOR INVENTORSHIP

### **Patents**

- U.S Patent 7,038,216 - Electrostatic Shape-Shifting Ion Optics
- U.S. Patent 6,984,821 - Mass Spectrometer and Methods of Increasing Dispersion Between Ion Beams
- U.S. Patent 5,665,966 - Current Measuring System
- U.S. Patent 5,506,185 - Ceramic Oxyanion Emitter
- U.S. Patent 4,968,888 - Pulsed Field Sample Neutralization