



Bonn-Cologne Graduate School of Physics and Astronomy

Welcome meeting

Festive event to open the new academic year

Friday, 5. November 2010, 3.30 p.m.
Lecture Hall of the Geo/Bio Science Departments,
Zülpicher Str. 49a, 50674 Köln

Preliminary programme:

- 3.30 p.m. Meeting of members (Mitgliederversammlung)
- 4.45 p.m. Welcome address Prof. Dr. M. Zirnbauer, Prof. Dr. J. Jolie
- 5 p.m. Talk by **Prof. Dr. Walter Kutschera**
Vienna Environmental Research Accelerator (VERA)
University of Vienna, Austria
"Exploring the World by Reading the Isotope Language"
- 6 p.m. Dinner / Informal get-together

Prof. Dr. Walter Kutschera has kindly agreed to be the guest speaker at this year's welcome meeting for our new BCGS members. We cordially invite all interested students to his talk.



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Exploring the World by Reading the Isotope Language

Walter Kutschera

Vienna Environmental Research Accelerator (VERA)

Fakultät für Physik – Isotopenforschung, Universität Wien, Austria

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Isotopes have been recognized as a unique property of matter some hundred years ago. It is now well established that isotopic abundances are subject to variations (mass fractionations) in essentially all physical and chemical processes. These variations – no matter how slight – can now be traced with ever growing precision in natural and artificial materials. They thus constitute a way to follow processes in our entire environment encompassing the atmosphere, the hydrosphere, the biosphere, the cryosphere, the lithosphere, the cosmosphere, and the technosphere [1]. If radioisotopes are involved, temporal evolution of processes can be traced as well. The enormous progress of mass spectrometric techniques in both low-energy mass spectrometry (LEMS) and accelerator mass spectrometry (AMS) allow us to ‘read’ the isotope language written into terrestrial and extraterrestrial matter. This presentation will attempt to convey the great power of gaining information about many fields by reading the isotope language. A few important examples for the application of LEMS will be given (e.g. connected to climate change), but emphasis will be placed on applications of AMS covering examples from diverse fields such as archaeology, geophysics, biochemistry, and astrophysics.

[1] W. Kutschera, Progress in isotope analysis at ultra-trace level by AMS, *International Journal on Mass Spectrometry* 242 (2005) 145-160.