

Lecture Course

# Application of Isotopes in Ecosystem Science



Prof. Dr. Yakov Kuzyakov

**Scope:** All master/PhD students and researchers interested in isotopes applications  
**Term:** 24 – 26<sup>th</sup> March, 2010 9:00 – 17:00  
**Place:** Room 2421, Institute of Geographical Sciences and Natural Resource Research, CAS (11A, Datun Road, Chaoyang District, Beijing)  
**Registration:** Dr. Xu Xingliang [xuxingli@hotmail.com](mailto:xuxingli@hotmail.com) Bai Jiebing [stonebai@126.com](mailto:stonebai@126.com)  
The course is free of charge

## The course will cover the following topics:

- Introduction, stable and radioactive isotopes, tracers
- Labeling and natural abundance, Tracer approaches
- Analytics of stable and radioactive isotopes
- Applications of isotopes in soil – plant – relationships studies
  - C and N input by plants into the soil  $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $\delta^{13}\text{C}$
  - C turnover and soil organic matter studies  $^{14}\text{C}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $\delta^{13}\text{C}$
  - Estimation of erosion by isotopes  $^{137}\text{Cs}$ ,  $^{210}\text{Pb}$ ,  $^7\text{Be}$
  - Autoradiography and phosphor imaging  $^{14}\text{C}$ ,  $^{33}\text{P}$ ,  $^{32}\text{P}$ , ...
  - Isotope dilution method  $^{15}\text{N}$
  - Bomb- $^{14}\text{C}$   $^{14}\text{C}$
  - Dating approaches  $^{14}\text{C}$ ,  $^{87}\text{Rb}$ - $^{87}\text{Sr}$ ,  $^{40}\text{K}$ - $^{40}\text{Ar}$ , U-Pb,  $^3\text{H}$ ,  $^{10}\text{Be}$
  - Intra-molecular, compound-specific and bulk isotope patterns in  $\text{C}_3$  and  $\text{C}_4$  plants
  - Future developments: Coupling of isotopes with molecular biology and biomarkers

For more information about the course: [www.aec.uni-bayreuth.de/isotop](http://www.aec.uni-bayreuth.de/isotop)

## Brief introduction about the speaker:

Dr. Yakov Kuzyakov's research covers major areas in soil ecology and biogeochemistry, such as  $\text{CO}_2$  fluxes, C sequestration, C/N turnover, nutrients, rhizosphere processes, priming effects, soil chemistry, bio-degradation, etc. applications of stable and radioactive isotopes.

Prof. Kuzyakov published more than 100 referred journal papers.

He is on the Editorial Boards of *European Journal of Soil Biology*, *Soil Biology & Biochemistry*, *Plant & Soil* and *Journal of Plant Nutrition & Soil Science*.

Prof. Kuzyakov have been working in Germany, Russia, USA, UK, Africa, and during 2010, he works as a visiting professor in the CAS, with Dr. Xu Xingliang as his host.

**Welcome all young scientists interested in isotope applications!**