

50 Years of Neutron Backscattering Spectroscopy



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Backscattering spectroscopy: How it all began

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Everything began with an idea of Heinz Maier-Leibnitz in 1966 : why not use perfect crystals as monochromators for neutrons with a Bragg angle of 90° ? He claimed that the backscattered beam should be highly monochromatic. One of his students, Berthold Alefeld, showed experimentally that the idea was right. Then two thesis students developed the first 'Rückstreupektometer' at the FRM in Garching. Quasielastic neutron scattering from glycerol and the hyperfine interactions in V_2O_3 could be studied with μeV resolution.

At that time many neutron scatterers were quite skeptical about the usefulness of this kind of research but there were also some believers who pushed the field forward. The most important supporter was Tasso Springer.

This workshop being held 50 years later in 2016 will show that a sentence attributed to Maier-Leibnitz is true: *The development of a new method, when ever its precision, sensitivity or resolution is much better than everything that existed in this field before, creates « new physics ».*

The research done at the FRM under Maier-Leibnitz half a century ago was aimed at the development of new ideas. Quite a number of them opened new fields in research which later matured through the work carried out at the ILL and other neutron scattering centers around the world.

I would like to dedicate this welcome to the late Berthold Alefeld. He was an outstanding experimentalist who produced an incredible number of new ideas in this field. One important example was his proposal of a phase space transformer. Berthold Alefeld is the real father of backscattering spectroscopy.

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