

## Yasutomo Uemura - Winner of the first ISMS Yamazaki Prize

*Yasutomo J. Uemura, Professor of Physics at Columbia University in New York, is well known for his studies of superconductivity and magnetism in strongly correlated electron systems using the muon spin relaxation ( $\mu$ SR) and neutron scattering techniques.*

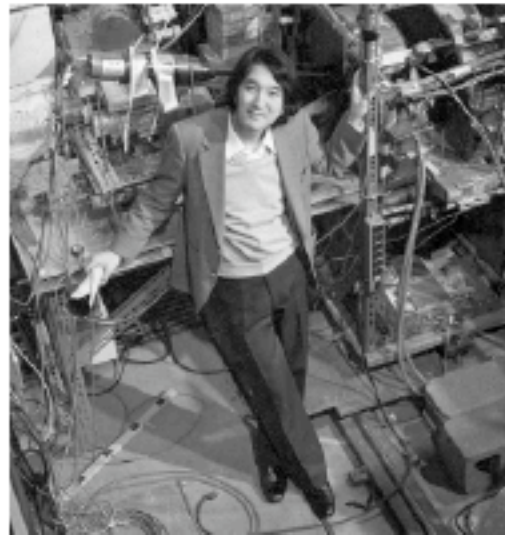


Born in Tokyo in 1953, Prof. Uemura obtained his D.Sc. in 1982 from Tokyo University under the supervision of Prof. Toshimitsu Yamazaki for  $\mu$ SR studies of Cu(Mn) and Au(Fe) spin glasses performed at TRIUMF. During 1983-88, he worked at Brookhaven National Laboratory with the neutron scattering group lead by Dr. Gen Shirane, initially as a JSPS Special Overseas Fellow and later as Associate Physicist of BNL. His work included neutron scattering and  $\mu$ SR studies of spin glasses, itinerant electron ferromagnets, heavy fermion systems, fractal spin systems and high-temperature superconductors (HTSC). He moved to Columbia University as an Associate Professor in 1988, and since then has been active in  $\mu$ SR studies of HTSC and other exotic superconductors, and geometrically frustrated and/or low-dimensional spin systems, as well as in developing phenomenological pictures for explaining condensation and pairing mechanisms of HTSC cuprates. Prof. Uemura was awarded the Packard Fellowship in 1989 and a NEDO International Research Grant as a group leader in 1995, and was elected as a Fellow of American Physical Society in 1999.

Prof. Uemura and his co-workers discovered a strong correlation between  $T_c$  and the superfluid density of HTSC systems in 1988-89, which has been often referred to as 'Uemura plot' among HTSC researchers. Other  $\mu$ SR accomplishments include development of Zero-Field  $\mu$ SR and longitudinal spin

relaxation studies with the Yamazaki group in 1978; observation of dynamic spin fluctuations in various spin glass systems since 1980; the first observation of antiferromagnetic order in  $\text{La}_2\text{CuO}_4$ , the parent compound of HTSC systems, in 1987; proposal of the 'nwiss cheese model' for Zn-doped HTSC systems in 1994-5, which was later verified by scanning tunneling microscope (STM) measurements; discovery of time-reversal symmetry breaking in  $\text{Sr}_2\text{RuO}_4$  superconductor in 1998; the first observation of coexistence of static magnetic order and superconductivity in  $\text{CeCu}_2\text{Si}_2$  in 1988; establishment of spatial phase separation between volumes carrying superconductivity and static magnetism in HTSC systems; finding persistence of dynamic spin fluctuations at very low temperatures in Kagome lattice spin systems; and development of muon spin relaxation functions in spin glasses, spin density wave, and other spin systems.

In the period 1978-2005, Prof. Uemura has published 238 scientific papers, including 5 in Nature, 36 in Physical Review Letters, and 45 in Physical Review B, and has presented 64 invited talks at international conferences and workshops. The ISMS is proud to have Professor Uemura as the first winner of the Yamazaki Prize for his outstanding and sustained work in  $\mu$ SR science.



Prof. Uemura at Brookhaven in 1988, around the time of proposal of the 'Uemura plot'.