

Biographical Sketch for: Keiiti Aki

BORN: March 3, 1930, at Yokohama, Japan; Male.

E-mail: <aki@ipgp.jussieu.fr>

EDUCATION:

B.Sc. (1952) in Geophysics, and Ph.D. (1958) in Geophysics, University of Tokyo.

POSITIONS HELD:

Research Fellow, California Institute of Technology (1958-60).

Associate Professor, Earthquake Research Institute., University of Tokyo (1963-66).

Professor of Geophysics, Massachusetts Institute of Technology (1966-84).

W.M. Keck Foundation Professor of Geophysics, University of Southern California (1984-2000).

SEISMOLOGICAL CONTRIBUTIONS:

- (1) Developed a variety of interpretation methods of seismological data for delineating earth structures and dynamic processes in tectonically active regions.
- (2) The structure study includes pioneering works in seismic tomography using teleseismic and local earthquake data, analysis of coda waves as scattered waves from small-scale heterogeneities in the lithosphere, frequency dependence of seismic attenuation in the lithosphere, detection of non-linear soil response in strong ground motion, and discovery of the fault-zone guided waves.
- (3) The study of dynamic process includes the invention of the concept of the seismic moment, the first scaling law of seismic spectra, the first interpretation of near-fault strong motion by a propagating dislocation model, developing models of heterogeneous fault zone based on the barrier concept, modeling volcanic tremor sources, and detection of scale dependence in earthquake phenomena.

SELECTED PUBLICATIONS:

- Aki, K. (1965). Maximum likelihood estimate of b in the formula $\log N=a-bM$ and its confidence limits, *Bull. Earthq. Res. Inst., Univ. Tokyo*, **43**, 237-239.
- Aki, K. (1966). Generation and propagation of G waves from the Niigata earthquake of June 16, 1964: Part 2. Estimation of earthquake moment, released energy and stress drop from the G wave spectra, *Bull. Earthq. Res. Inst., Univ. Tokyo*, **44**, 73-88.
- Aki, K. (1967). Scaling law of seismic spectra, *J. Geophys. Res.*, **72**, 1217-1231.
- Aki, K. (1968). Seismic displacement near a fault, *J. Geophys. Res.*, **73**, 5359-5376.
- Aki, K. (1969). Analysis of the seismic coda of local earthquakes as scattered waves, *J. Geophys. Res.*, **74**, 6215-6231.
- Aki, K. and B. Chouet (1975). Origin of coda waves: source, attenuation and scattering effects, *J. Geophys. Res.*, **80**, 3322-3342.
- Aki, K. and W. H. K. Lee (1976). Determination of three dimensional velocity anomalies under a seismic array using first P arrival times from local earthquakes, 1. A homogeneous initial model, *J. Geophys. Res.*, **81**, 4381-4399.
- Aki, K., A. Christofferson, and E. S. Husebye (1977). Determination of the three-dimensional seismic structure of the lithosphere, *J. Geophys. Res.*, **82**, 277-296.
- Aki, K., M. Fehler, and S. Das (1977). Source mechanism of volcanic tremors: fluid driven crack models and their application to the 1963 Kilauea eruption, *J. Volcanol. Geotherm. Res.*, **2**, 259-287.
- Aki, K. (1979). Characterization of barriers on an earthquake fault, *J. Geophys. Res.*, **84**, 6140-6148.
- Aki, K. and P. Richards (1980). "Quantitative Seismology: theory and methods", Freeman, San Francisco, 932 pp.
- Aki, K. (1980). Attenuation of shear waves in the lithosphere for frequencies from 0.05 to 25 Hz, *Phys. Earth Planet. Inter.*, **21**, 50-60.
- Papageorgiou, A. S. and K. Aki (1983). A specific barrier model for the quantitative description of inhomogeneous faulting and prediction of strong ground motion, Part I and II, *Bull. Seis. Soc. Am.*, **73**, 693-722, and 953-978.
- Aki, K. (1993). Local site effects on weak and strong ground motion, *Tectonophysics*, **218**, 93-111.
- Li, Y. G., K. Aki, D. Adams, A. Hasemi, and W. H. K. Lee (1994). Seismic guided waves trapped in the fault zone of the Landers, California, earthquake of 1992, *J. Geophys. Res.*, **99**, 11705-11722.
- Aki, K. (1996). Scale dependence in earthquake phenomena and its relevance to earthquake prediction, *Proc. Natl. Acad. Sci., USA*, **93**, 3740-3747.