Biographical Encyclopedia of Astronomers

Walker, Arthur Geoffrey

Born Watford, Hertfordshire, England, 17 July 1909

Died Sussex, England, 31 March 2001

British mathematician Arthur Geoffrey Walker is remembered in cosmology for the formulation of the Robertson-Walker metric, a very general description of the four-dimensional structure of a homogeneous, isotropic space-time, applicable to the Universe as a whole.

Walker received an M.A. from Oxford University and a Ph.D. from the University of Edinburgh. He was appointed a lecturer in mathematics at Imperial College, London, in 1935, moved to Liverpool University (1936–1947) and to the chair of mathematics at the University of Sheffield, and finally returned to Liverpool University, from where he retired in 1974. Walker was a fellow of the Royal Society of London and of the Royal Society of Edinburgh, and received prizes from the Royal Society of Engineers and the London Mathematical Society

Walker's research focused on geometry, especially Reimannian and other manifolds. In 1935/1936, he (and, independently, Howard Robertson) recognized that the solutions to Albert Einstein's equations of general relativity, published earlier by Wilhelm de Sitter and Georges Lemaître, embodied a way of looking at the geometry of space-time that could be generalized to apply to a wider range of theories of gravity and cosmological models for any homogeneous, isotropic universe. The metric is still in general use, and a theory of gravity that cannot be put into metric form (this or some other) is automatically somewhat suspect.

Douglas Scott

Selected Reference

Walker, Arthur G. (1935). "On Reimannian Spaces with Spherical Symmetry about a Line, and the Conditions of Isotropy in General Relativity." *Quarterly Journal of Mathematics* 6: 81-93