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Editor's Note: On a Stationary Cosmology in the Sense of Einstein's Theory of Gravitation

by Kornel Lanczos, *Zeitschrift für Physik* 21 **(1924), 73–110**

When asked who found the first exact solution of Einstein's equations with rotating matter source and when, most physicists would answer that it was Gödel, in 1949 [1]. In fact, the correct answer is Lanczos in 1924, in the paper printed in this issue. Setting the historical record straight is the first reason for republishing Lanczos' paper. (To be sure, Gödel's solution was new in 1949 because it is different from Lanczos', it is very important and was discussed by Gödel with illuminating insights, but the credit for historical priority that it enjoys is not deserved.)

There is one more reason. Back in 1924, exact solutions of Einstein's equations were still a rarity. Nevertheless, the author was not satisfied just to derive a new exact solution. He felt obliged to investigate what the solution implies for our Universe, and he did so with such breadth, depth and clarity that the paper can set standards and provide inspiration to readers even today.

The modern reader will have to forgive the author for a few inconsistencies with the now commonly accepted terminology (such as the notion of static vs. stationary solutions discussed in the introduction) and, in places, for an old-fashioned, long-forgotten notation. Also, in 1924 nobody was yet aware that our Galaxy is not the whole Universe, and that the Sun is not at the center of the Galaxy. Strictly speaking, the astrophysical considerations of the author are not acceptable today. However, his boldness in using relativity to explain the observed world can still be enlightening.

The Lanczos solution was rediscovered by van Stockum [2] who investigated a class of stationary-axisymmetric spacetimes, and then rediscov-

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ered again by Wright [3]. Even today van Stockum still gets the credit for Lanczos' discovery.

— *Andrzej Krasiński, Associate Editor*

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2. van Stockum, W. J. (1937). *Proc. Roy. Soc. Edinburgh* 57, 135.
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Lanczos: a brief biography

The author was born on 2 February 1893 in Székesfehérvár, Hungary, as Kornél Löwy. In the early 1900s his family "hungarized" their name to Lánczos. From about 1927 he signed his non-Hungarian papers as Cornel or (most often) Cornelius. He studied at the University of Budapest, receiving his Ph.D. in 1921. Also in 1921, on the wave of anti-Semitic oppression in Hungary, Lanczos resettled in Germany, where he held positions in Freiburg, Frankfurt and Berlin (as Einstein's assistant).

In 1931 he went as visiting profesor to Purdue University, and the leave turned permanent in consequence of the political developments in Germany. He stayed in the USA until 1952 and worked at Purdue (1931–1946), at the National Bureau of Standards and at the Boeing Aircraft Company. In the period 1931–39 he was taking a half-year leave every year to visit his ill wife in Hungary, who was not allowed to enter the USA. In 1952 he went to the Dublin Institute for Advanced Studies, and again this one-year leave turned permanent, this time because of McCarthyite harrassment in the USA. However, he returned to the USA many times as a visiting professor.

Besides relativity, he also made contributions to quantum mechanics (among other things, inventing an integral formulation of quantum mechanics, equivalent to that based on the Schrödinger equation which was published almost simultaneously), applied mathematics, numerical analysis (he invented the now well-known "Tau method" of approximation), mechanics (his book, *The Variational Principles of Mechanics*, has been very successful and had four editions) and matrix theory. In relativity, he is best known for his elaboration of the dynamics of surface distributions of matter. He wrote 113 scientific papers and 8 books [1].

Cornelius Lanczos died on 25 June 1974 while on a visit to Budapest, and is buried there in the Jewish cemetery.

— *Andrzej Krasiński, Associate Editor*
based on B. Gellai, P.D. Lax
and G. Marx, in Ref. 1

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1. Brown, J. D., *et al.*, eds. (1994). *Proc. Cornelius Lanczos International Centenary Conference* (Society for Industrial and Applied Mathematics, Philadelphia).