EJNAR HERTZSPRUNG
1873-1967

Hertzsprung was born on 8 October 1873 in Frederiksberg/Copenhagen, the son of Severin Carel Ludwig Hertzsprung and Henriette Christiane Charlotte Frost. His father had studied astronomy at the University of Copenhagen but, unable to find a position in this field, had gone to work for the government and was director of the state life insurance company. Both the interest in astronomy and the fear that one could not make a living at it were transferred from father to son, and as a result Ejnar studied chemical engineering at the Polytechnic Institute in Copenhagen. Upon graduating, in 1898, he worked as a chemist in St. Petersburg for three years and then, in 1901, he went to Leipzig to study photochemistry under Wilhelm Ostwald for a year. His knowledge of photochemistry was very important in his career in astronomy and astrophysics, a field in which photography had become a crucial tool by the turn of the century.

In 1902, Hertzsprung returned to Frederiksberg and Copenhagen and became an astronomer, first as an amateur and then as an employee first of a private observatory in Frederiksberg and later of the observatory of the University of Copenhagen. In 1905 and 1907 he published two papers, both entitled 'Zur Strahlung der Sterne', in a photography journal. In these papers Hertzsprung showed, first, that stars with very sharp absorption lines in Antonia Maury's classification system were more luminous than others—a discovery that became the foundation of the method of stellar parallax—and, second, that stars could be classified in two series, the main sequence (in modern parlance) and the high-luminosity giant stars when plotted in a diagram of intrinsic luminosity vs. temperature. Because of the appearance of these results in a photography journal, it had little impact in the astronomical community, and it was not until the same relationship had been discovered by Henry Norris Russell, several years later, that Hertzsprung's discoveries were recognized. The diagram became known as the Hertzsprung—Russell diagram.

In 1909, Karl Schwarzschild had Hertzsprung appointed associate professor at the University of Göttingen, and then took him with him as a senior staff astronomer when he became director of the Potsdam Observatory. In 1913 Hertzsprung married Mariette Augustine Albertine Kapteyn, the daughter of the well-known Groningen astronomer Jacobus Kapteyn. (They had one daughter.) It was through

his connections in the Netherlands that Hertzsprung was appointed adjunct director of the Leiden Observatory in 1919, under its new director, Willem de Sitter. His appointment as professor extraordinarius of mathematics and physics (with astronomy as his teaching subject) followed the following year. In 1935, upon De Sitter's death, Hertzsprung was named director of the observatory. He retired in 1944 and returned to Denmark, where he continued to do important research in astronomy.

Hertzsprung's life was marked by a complete devotion to his work (his marriage ended in divorce in 1937) and a great commitment to precise observations. His work on double stars and variable stars was of fundamental importance. Thus, through his study of Cepheid variables he was able, in 1913, to determine the distance to the Magellanic Clouds, the first distance of an extra-galactic object ('Über die raumliche Verteilung der Veränderlichen vom Delta Cephei-Typus', 1914). Hertzsprung received honorary doctorates from the universities of Utrecht, Copenhagen, and Paris, he received the gold medal of the Royal Astronomical Society in 1929, the Bruce Gold Medal of the Astronomical Society of the Pacific in 1937, and the Ole Rømer Medal from the city of Copenhagen in 1959. He died on 21 October 1967 at the age of 94.

Primary works

Poggendorff, vol. 5, 525-526; vol. 6, 1095; vol. 7B, 1967-1968. 'Zur Strahlung der Sterne', *Zeitschrift für Wissenschaftliche Photographie* 3 (1905) 429-442, 5 (1907) 86-107; reprinted as Ostwalds Klassiker der exakten Wissenschaften, 255, ed. Dieter B. Herrmann (Leipzig: Geest & Portig, 1976); 'On New Members of the System of the Stars β, γ, δ, ε Ursae Majoris', *Astrophysical Journal* 30 (1909) 135-143; 'Über die Verwendung photographischer effektiver Wellenlängen zur Bestimmung von Farbenäquivalenten', *Publikationen des Astrophysikalischen Observatoriums zu Potsdam* 22 (1911) 1-40; 'Nachweis der Veränderlichkeit von α Ursae Minoris', *Astronomische Nachrichten* 189 (1911) 89-104; 'Über Doppelsterne mit eben merklicher Bahnbewegung', *Astronomische Nachrichten* 190 (1912) 113-118; 'Über die raumliche Verteilung der Veränderlichen vom Delta Cephei-Typus', *Astronomische Nachrichten* 196 (1914) 201-210; 'Effective Wave-Lengths of 184 Stars in Cluster N.G.C. 1647', *Astrophysical Journal* 42 (1915)

92-110; 'Bermerkungen zur Statistik der Sternparallaxen', *Astronomische Nachrichten* 208 (1919) 89-96; 'Photographische Messungen von Doppelsternen', *Publikationen des Astrophysikalischen Observatoriums zu Potsdam* 24 part 2 (1920); 'Mean Colour Equivalents and Hypothetical Angular Semi-Diameters of 734 Stars Brighter Than Fifth Magnitude and Within 95° of the North Pole', *Annalen van de Sterrewacht te Leiden* 14, part 1 (1922); 'Effective Wavelengths of Stars in the Pleiades', *Kongelige Danske Videnskabernes Selskabs Skrifter*, Sciences section, 8th series, vol. 4, no. 4 (1923); 'On the Relation between Mass and Absolute Brightness of Components in Double Stars', *Bulletin of the Astronomical Institutes of the Netherlands* 2 (1923) 15-18; 'The Pleiades', *Monthly Notices of the Royal Astronomical Society* 89 (1929) 660-678 (George Darwin Lecture); 'Catalogue de 3259 étoiles dans les Pléiades', *Annalen van de Sterrewacht te Leiden* 19, part 1 (1947). See also the volume of reprints of papers in *Bulletin of the Astronomical Institutes of the Netherlands*, 1943.

Secondary sources

A.J. Wesselink, 'Ejnar Hertzsprung', *Quarterly Journal of the Royal Astronomical Society* 9 (1968) 337-341; A.V. Nielsen, 'Ejnar Hertzsprung, measurer of the stars', *Sky and Telescope* 35 (1968) 4-6; K.Aa. Strand, 'Ejnar Hertzsprung, 1873-1967', *Publications of the Astronomical Society of the Pacific* 80 (1968) 51-56; P.T. Oosterhoff, in: *Hemel en Dampkring* 66 (1968) 337-341.

T.E.R. Phillips, 'Address on the Award of the Gold Medal of the Royal Astronomical Society to E. Hertzsprung', *Monthly Notices of the Royal Astronomical Society* 89 (1929) 404-417; A.O. Leuschner, 'The Award of the Bruce Gold Medal to Professor Ejnar Hertzsprung', *Publications of the Astronomical Society of the Pacific* 49 (1937) 65-81; J.H. Oort and K.Aa. Strand, 'Ejnar Hertzsprung and the Leiden Observatory', *Popular Astronomy* 55 (1947) 361-364; A.V. Nielsen, 'Contributions to the History of the Hertzsprung—Russell Diagram', *Centaurus* 9 (1964) 219-253; *Aspects of Stellar Evolution. Proceedings of a Conference held in Honour of Ejnar Hertzsprung, Flagstaff, Arizona, 1964)*, ed. A. Beer and K.Aa. Strand, *Vistas in Astronomy*, vol. 8; B.W. Sitterly, 'Changing Interpretations of the Hertzsprung—Russell Diagram, 1910-1940: A Historical Note', *Vistas in Astronomy* 12 (1970) 357-366; D.H. De Vorkin, 'Steps toward the Hertzsprung-Russell

diagram', *Physics Today* 31(3) (1978) 32-39; D.B. Herrmann, *Ejnar Hertzsprung: Pionier der Sternforschung* (Berlin: Springer Verlag, 1994). A. Blaauw, in: *BWN*, vol. 3, 248-250; K.Aa. Strand, in: *DSB*, vol. 6, 350-353.

[A.v.H.]