Jan Hendrik Oort
1900-1992

Oort was born on 28 April 1900 in the city of Franeker (Friesland), but when he was three years old his family moved to Oestgeest near Leiden. His father, who was a psychiatrist by training, had become director of a nearby psychiatric clinic. Young Oort attended the HBS in Leiden and in 1917 went to Groningen to study natural sciences. He was mainly attracted to Groningen by the fame of the astronomer J.C. Kapteyn and it was Kapteyn who made him decide to opt for astronomy. Even before he passed his doctoral examination Oort had chosen his topic of research, the high-velocity stars. This topic did not fit in the research program of Kapteyn, but the astronomer was certainly interested in it. Oort passed his doctoral examination in 1921 and became assistant to Kapteyn's successor, P.J. van Rhijn.

Van Rhijn realized how good it would be for Oort to get some international experience and therefore arranged a stay of two years in the United States. From 1922 to 1924 Oort worked at the Yale observatory at New Haven with Frank Schlesinger. He worked in positional astronomy, which did not appeal to him very much, but he saw a lot of the American astronomical milieu. In 1924 he accepted the position of research assistant at the observatory at Leiden, where he finished the research for his doctorate. In 1926 he took his degree in Groningen with a dissertation on *The stars of high velocity* (Van Rhijn was his supervisor). In the same year Oort became conservator and *privat-dozent* at Leiden. In 1927 he married Johanna Maria Graadt van Roggen. They had two sons and one daughter.

Oort himself was not very content with his dissertation because he had not been able to find a convincing explanation for the movements of the stars he had investigated. But two years later he was able to demonstrate that—as the Swedish astronomer Lindblad had already suggested—the movements of these high-velocity stars could be accounted for if one assumed that the Milky Way is not a stationary system, but a rotating disc (with the earth far from the center). Oort discovered the phenomenon of differential rotation and in two articles in 1927 and 1928 empirically demonstrated the rotation of the galaxy. In his elegant formulae describing the local effects of galactic rotation he introduced two constants A and B, mostly called 'Oort's constants'. With these articles he was able to make a name for himself among astronomers and he further strengthened

his reputation with an article on the gravitational force perpendicular to the galactic plane (1932). In the meantime in recognition of his merits he had become lecturer in astronomy in Leiden (1930).

The unexpected death of De Sitter in 1934 led to Oort's promotion to the position of extraordinary professor of astronomy and adjunct-director (under Hertzsprung) of the observatory in 1935. In his inaugural lecture, *De bouw der sterrenstelsels* (The structure of star systems), he developed a research program which would keep him busy for the rest of his career. In the same year Oort was chosen as the general secretary of the International Astronomical Union and in 1937 he became a member of the Royal Netherlands Academy of Arts and Sciences.

During the war Oort had to change his plans. He resigned from his professorship in Leiden and temporarily moved to the rural town of Hulshorst. There he started to write a textbook on the Milky Way, but he did not get very far. It was not his style to summarize what others had found; he was someone who prefers to explore the unknown. Nevertheless, parts of his unfinished manuscript later served as the basis for an important chapter in a textbook on stellar dynamics (1965). During the war, Oort also came into contact with a student from Utrecht, H.C. van de Hulst. Together, they explored—theoretically of course—the implications of the recent discovery of radio sources in the universe. If, so Van de Hulst argued, one was able to detect the 21 cm hydrogen line in the spectrum of this radiation, astronomers would have at their disposal a new and revolutionary means to explore the universe.

Immediately after the war, Oort set out to make the Netherlands one of the world's leading centers of radio astronomy. In 1945 he had become ordinary professor of astronomy and director of the observatory and he was on very good terms with influential politicians and administrators. The Leiden and Groningen astronomers started with a radar antenna left behind by the Germans in Kootwijk; then in 1956 Oort was able to have a new radio telescope built at Dwingeloo; and in 1970 his work was crowned by the aperture-synthesis-radio telescope of Westerbork. From the data produced by these telescopes Oort was able to prove that the galaxy consists of several rotating spiral arms. As a sideline Oort also did research on comets and concluded that comets originate in a cloud of comets (actually a reservoir of debris that has its origin in the birth of

the solar system) that lies almost halfway to the nearest stars. This reservoir is usually called the 'Oort Cloud'.

Oort's organizing power was also demonstrated outside the Netherlands. Until 1948 he was general secretary of the IAU and he was instrumental in the rapid re-admission of German astronomers. From 1958 to 1961 Oort was president of the IAU, in a turbulent time when the Chinese were in conflict with the Russians. Oort's diplomatic skills were also decisive in the foundation of the European Southern Observatory in Chili (1964). His international standing was expressed in a great number of honorary degrees bestowed on him, beginning shortly after the war.

In 1970 Oort resigned as professor at Leiden, but he continued his research for many more years. Even at this age, he did not have the slightest inclination to look back on what had been achieved, always remaining more interested in what lay ahead. When, in 1987, he received the very prestigious Kyoto Prize, he did not lecture on events of the past, but rather on a new subject that interested him very much, namely super clusters. Oort died on 5 November 1992.

Primary works

Poggendorff, vol. 6, 1911; vol. 7B, 3733-3737. J. Katgert-Merkelijn, *The Letters and Papers of Jan Hendrik Oort as archived in the University Library, Leiden* (Dordrecht, 1997). This inventory also contains a complete list of Oort's publications.

Secondary sources

H. van Woerden et al., eds, *Oort and the universe: Liber amicorum presented to Jan Hendrik Oort on the occasion of his 80th birthday* (Dordrecht and Boston: Reidel, 1980); G. van Herk et al., *De Leidse Sterrewacht. Vier eeuwen wacht bij dag en nacht* (Zwolle, 1983) 95-115; T. Verheul, 'Het heelal van Jan Hendrik Oort', in *idem*, *De profs. Vijf fameuze Nederlandse wetenschappers* (Bloemendaal, 1988) 63-82; A. Blaauw, *ESO's early history* (Munich, 1991); A. Blaauw, in: *Zenit* 20 (1993) 196-210; A. Blaauw and M. Schmidt, in: *Publications of the Astronomical Society of the Pacific* 105 (1993) 681-685; H.C. van de Hulst, 'Jan Hendrik Oort (28 April 1900—5 November 1992)', *Proceedings of the American Philosophical*

Society 138 (1994) 449-455, and *Biographical Memoirs of Fellows of the Royal Society* 40 (1994) 321-26; J. Katgert-Merkelijn, 'A short biography of Jan Hendrik Oort', in *idem*, *The Letters and Papers of Jan Hendrik Oort* (see above), xv-xxx.

[K.v.B.]