

## In memoriam Jan Borgman (1929-2021)

### *Gifted instrumentalist, space research pioneer and science leader*

Jan Borgman started his career in astronomy in Groningen with a PhD Thesis entitled 'Electronic scanning for variable stars' (1956). He showed that one could successfully compare two photographic plates of the 48-inch Palomar Schmidt telescope by projecting a positive image of one plate on top of a negative image of a second plate. In this way variable stars could easily be discovered. The instrument that he built was used for the Palomar-Groningen Survey of variable stars by Lucas Plaut and allowed an accurate determination of the distance to the center of our galaxy with RR Lyrae stars by Oort and Plaut.

In 1957 Adriaan Blaauw became the new director of the Kapteyn Laboratory. Blaauw was keenly interested in so called OB Associations. At his suggestion Borgman built a photoelectric photometer with seven filters especially suited for O and B stars. He used this system first to investigate variations of the interstellar extinction throughout the Galaxy and then, together with Blaauw, for a detailed study of OB Associations.

When Blaauw came to Groningen he had secured funds for a new observatory beforehand. Jan Borgman supervised its construction and became its first director in 1965. This Kapteyn Observatory in Roden housed a 61 cm telescope to be used mainly for instrument testing and student practice and it became the home for all instrumental activities of the Kapteyn Institute.

Around 1965 Borgman also became heavily involved in the preparations for the new European Southern Observatory that was under construction on La Silla mountain in Chile. The new facilities at Roden were an obvious opportunity for the development of instrumentation for ESO. The first instrument built by Borgman's team in Roden was the photometer for the 1-meter telescope, the first telescope in regular operation on La Silla. In February 1966 Borgman hosted 70 photometrists from all over the world at the Kapteyn Observatory for a 3-day conference on photometry. This was ESO Colloquium No.1; its proceedings appeared as ESO Bulletin No.1, with Borgman as editor.

In the meantime Borgman had realized that one should really go to space to cover the ultraviolet and infrared parts of the spectrum. Already in his inaugural address in 1965 he proposed the building of a Dutch astronomical satellite for UV observations. At the time this idea was met with skepticism and even opposition because it was feared that it would absorb funds for astronomy in general. But Borgman proved to be a very effective lobbyist: he secured the interest of Fokker and Philips and even managed to convince NASA to launch such a satellite in exchange for an American X-Ray instrument on board of the satellite. The Utrecht X-Ray group also contributed an instrument. And thus the Astronomische Nederlandse Satelliet ANS was launched on August 30, 1974. The UV photometer onboard ANS proved to be a great success. It secured some 20.000 very accurate observations in five spectral passbands of 6000 objects. A duplicate of the photometer is kept at the Groningen University Museum.

For Fokker and Philips these successes were also of great value. Clearly the infrared part of the spectrum should be next. It resulted in the infrared satellite IRAS, launched in 1983, by an international consortium, also under Dutch leadership and highly successful.

By these developments Borgman's instrumentation group in Roden had grown considerably, with one part devoted to ground-based astronomy and the other specializing in space research. In the course of time the observatory in Roden became too small to house all of them and the space research group moved to Groningen in a new configuration, as the Groningen department of SRON, the organization for space research in the Netherlands. Together with Henk van de Hulst in Leiden and Kees de Jager in Utrecht, Jan Borgman was thus one of the three founding fathers of Dutch space research.

Borgman's leadership in science was recognized by his colleagues at Groningen University. He became dean of the faculty of Mathematics and Physical Sciences (1975), rector of Groningen University (1978-1981), chair of the Board of Groningen University (1981-1988). He left Groningen in 1988 to chair the newly formed Netherlands Organization for Scientific Research NWO in The Hague. From 1994 to 1997 Borgman was the first chairman of the European Science and Technology Assembly, a new body created by the European Commission.

Jan Borgman was elected member of the Royal Netherlands Academy of Arts and Sciences in 1978. He received the distinctions of Ridder in de Orde van de Nederlandse Leeuw and Commandeur in de Orde van Oranje-Nassau.

One reason for Jan's successes was no doubt his amiable personality. He could work effectively with everybody, from instrumentmakers to government officials. For students and colleagues he was an ideal mentor and friend. The Kapteyn Institute and Dutch astronomy in general owe him a great debt of gratitude.

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