Hubble’s Nobel Prize

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Abstract

Astronomy is not in the list of natural sciences aimed at by the Nobel awards. In spite of that, there were, throughout the 1930s until the early 1950s, effective moves by important scientists to distinguish Hubble with the Prize. A short report on these attempts is made as well as speculation on what would be the citation for the prize in view of the broad range of Hubble’s scientific achievements. Within this context, the opportunity is also taken for publicizing the Crafoord Prize which does consider astronomy.

1 Introduction

The astronomer Edwin Powell Hubble never won the Nobel Prize because he died unexpectedly, at the age of almost 64, on September 28, 1953, due to a cerebral thrombosis. His long time family physician assured (!) his wife, Grace Hubble, that the death had been “instantaneous and without pain” (Christianson 1995 — hereafter CHR).

Is there a Nobel Prize for Astronomy? No, there is not! Hubble would have been the first one to brake the old tradition and to change the statutes of the award, as I show below. In the light of this possibility, one might
also wonder what Hubble would win the Prize for, given his many scientific achievements.

But before that, in the next section, I describe another first rank award series, also under the auspices of the Royal Swedish Academy of Sciences, namely, the Crafoord Prize. This Prize includes astronomy in the list of awards. In the final section, I comment on the story behind the Nobel award to Hubble and speculate on the choice that would be made by the Nobel Committee, from among his many fundamental investigations in astronomy, as the Prize statement.

2 The Crafoord Prize

The Anna-Greta Holger Crafoord Fund was established in 1980 to promote basic scientific research through yearly donations to the Royal Swedish Academy of Sciences. Holger Crafoord (1908-1982) was very active in Swedish industry. From 1964 and on, he developed and manufactured the artificial kidney, a sort of biological dialyzer that would become of vital importance in the world. His company also developed a series of medical instruments that contributed to earn him an enormous fortune.

In 1976 he became an honorary doctor of medicine at the University of Lund, followed by his wife, Anna-Greta Crafoord (1914-1994), in 1987.

Specifically, the purpose of the Fund is to promote and award research in the fields not covered by the Nobel Prizes in natural sciences, namely, mathematics, geosciences, biosciences (with special emphasis in ecology and rheumatoid arthritis), and astronomy. The awards follow a closed cycle based on the annual sequence:

1. mathematics,
2. geosciences,
3. biosciences,
4. astronomy,
5. geosciences,
6. biosciences,
7. mathematics.

The first Crafoord Prize was awarded in 1982 to V.I. Arnold, from Moscow State University, for his contribution to the theory of non-linear differential equations. The Prize amounts to $500,000 US, a gold medal, and a diploma.

The Crafford Prize is thus every six years assigned to astronomy. The first recipient was Lyman Spitzer, Jr. (1985), then Allan R. Sandage (1991) and in 1997 there were two winners, Fred Hoyle and Edwin E. Salpeter.

More information on the Crafoord and Nobel Prizes are found in the electronic pages of the Royal Swedish Academy of Sciences at the address www.kva.se/eng/pg/prizes/index.asp.

3 Hubble’s Nobel

As early as the 1930s (CHR), Fred Hoyle, a frequent guest of the Hubbles at Pasadena, informed Hubble that there was a move, known of in England, by the Nobel Prize Committee in the direction of a legal amendment to the award statutes to make it possible for Hubble to be honoured with this major distinction in natural sciences. The very same rumor was also heard from Nobel laureate Robert Millikan, Caltech’s celebrated physicist.

Of course, Hubble had already been awarded many distinctive prizes, the highest being the Barnard medal, a charge of the National Academy of Sciences, which was granted to him in 1935 at Columbia University. The medal was established in 1895 and is awarded once every five years. All of Hubble’s predecessors were Nobel laureates, among them Roentgen, Rutherford, Einstein, Bohr and Heisenberg (CHR). In this case Hubble was also distinguished by being both the first American and the first astronomer to win the medal. The citation in his award was for his “important studies of nebulae, particularly of the extragalactic nebulae which provide the greatest contribution that has been made in recent years to our observational knowledge of the large-scale behavior of the Universe”.

By 1949 nothing had yet happened, but with the support of the 5-metre Palomar telescope, already in operation, Hubble’s work had gained much publicity, which could have triggered a decision by the Nobel Committee (CHR). The final word was soon given when Enrico Fermi and Subrahmanyan Chandrasekhar joined their colleagues in the Committee unanimously voting Hubble the 1953 Prize in physics (CHR). But it was too late, Hubble’s death
came first. Incidentally, one should recall that the Nobel prize is not awarded posthumously.

These are the facts. Let us now speculate on an alternate universe, one in which Hubble did survive that unfortunate September afternoon.

The immediate question is what Hubble would be cited for in the Nobel award. The conservative approach usually adopted by the Nobel Committee is well known. The classical example is Einstein’s. Awarded the 1921 prize, he was specially cited for his discovery of the law of the photoelectric effect. It is needless to say that both the Special and General Relativity Theories, which had already been put forward, were not explicitly mentioned.

Allan Sandage, a Crafford laureate and the greatest of Hubble’s followers, in a paper celebrating the centennial of the birth of Hubble (Sandage 1989), enumerates Hubble’s four central accomplishments undertaken from 1922 to 1936. Sandage adds that any one of them guarantees Hubble a place in the history of modern science. They are:

(a) the morphological sequence of galaxy types,

(b) the discovery of Cepheids in NGC6822, with parallel work in M31 and M33, settling decisively the question of the nature of galaxies,

(c) the determination of the homogeneity of the distribution of galaxies, averaged over many solid angles, and

(d) the linear velocity-distance relation.

All of the four but one may be blurred with controversies, not only in modern times but also, and certainly, in Hubble’s time. Nowadays it is recognized that the so-called Hubble “tuning-fork” scheme in (a) applies mainly to close and bright galaxies, that the homogeneity in (c) is broken by the presence of enormous structures like “walls”, “streams” and “voids” of galaxies, and, finally, even Hubble himself never clearly advocated the idea of a velocity-distance relation in (d); rather he usually put it as a relation between spectral shift and distance, as is evident throughout the classical book *The Realm of the Nebulae* (Hubble 1936). In short, these three otherwise fundamental advances in modern astronomy seem to collide with the spirit of Nobel citations, i.e., they are not solid statements about nature.

This shortcoming is not the case, by any means, with item (b) above. Hubble’s work here is the end point of the great debate about the nature
of the nebulae. With the unambiguous determination of the distances to the “spiral nebulae” to be much larger than the dimensions of our stellar system, Hubble proved definitely that they are extragalactic, and as a result laid down the foundations of a new branch of research, namely, extragalactic astronomy. The other three points mentioned by Sandage are immediate consequences of this major realization, which were soon recognized as such by the genius of Hubble.

Thus, the Nobel prize to Edwin Powell Hubble goes for his contribution to the definitive understanding of the nature of the nebulae and for the creation of a new era of scientific investigation.

4 References

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