Introduction

Bengt Strömgren was born in 1908 and died in 1987. At an age of 13 he began regular observations with a transit instrument and took part in computations of the orbit of comet Baade. His first publication appeared when he was 17 years old and the last one shortly before his death. Throughout his long scientific life he made fundamental contributions to many different fields in astronomy and astrophysics, his research being characterized by the systematic development of methods and always directed towards important scientific problems, which he solved by combining observational data with physical theories through a careful numerical analysis. His work contributed significantly to making astrophysics an exact and recognized science in this century.

With references to the following bibliography of Bengt Strömgren a brief sketch of his main scientific contributions will be presented here. His first publications concerned celestial mechanics and meridian astronomy, including a pioneering work on photoelectric registrations of star transits [2]. Around 1930 he shifted to the field of astrophysics and on the basis of quantum mechanical calculations of the opacity of stellar matter he showed that hydrogen is the main constituent of stars [9]. In continuation of this work he interpreted the distribution of stars in the Hertzsprung-Russell diagram in terms of stellar evolution caused by the transformation of hydrogen into more complex elements [11] and determined the relative content of helium and hydrogen in stellar interiors [23]. In the late thirties he became interested in interstellar matter and in a classical paper [24] he showed that the transition zone between fully ionized and neutral hydrogen in a gas cloud around a hot star is rather thin, and thus explained the structure of HII-regions. Around 1940 he was the first to construct a realistic model of the solar atmosphere with the newly discovered H^- absorption taken into account [25]. The model was used to determine abundances of sodium, magnesium, potassium and calcium that agreed remarkably well with the composition of meteorites. Later on he also made a pioneering study of the physical state and chemical composition of the cold interstellar gas [31].

From about 1950 Bengt Strömgren's work was centered around a grand investigation of the structure, composition, dynamics and evolution of the Galaxy. The foundation was the *uvby*-β photometric system [59], and the very extensive and accurate photoelectric observations in this system, which he organized and actively took part in for more than 20 years, e.g. [54] and [66]. This work includes determination of ages of field stars [46, 57, 58], computation of orbits and birthplaces of stars [53, 62], three-dimensional mapping of interstellar reddening [64], determination of metal abundances of F-type stars [49, 63], discovery of possible helium abundance differences among young stars and clusters [71], and studies of the kinematics of different populations of stars [51, 74].

In his last paper [77] Bengt Strömgren reviewed the results of the very extensive

investigation of F stars within 100 parsec which he carried out in collaboration with younger Danish astronomers. Interesting relations between stellar ages, metal abundances and velocity dispersions were presented. These relations are statistically much more significant than corresponding relations from other investigations and are of fundamental importance for the understanding of the evolution of the Galaxy. Yet it is characteristic of Bengt Strömgren that a large part of the paper is used for a discussion of potential errors and in pointing out a number of areas in which the analysis could be improved.

Bengt Strömgren's influence on 20th century astronomy and astrophysics goes far beyond what is documented in his own publications. He initiated and directed a number of large projects in the fields of astrometry, photoelectric photometry, stellar atmospheres, stellar interiors and galactic dynamics. He very seldom wanted to be a co-author on publications resulting from these investigations and as a result future generations will only be able to trace his influence through the acknowledgements in these publications.

Bengt Strömgren also undertook to serve on many expert commissions and carry out many administrative duties. He made important contributions to worldwide collaboration in astronomy as General Secretary (1948-52) and later President (1970-73) of the International Astronomical Union. During his years in the United States, first as director of the Yerkes and McDonald Observatories (1951-57) and later on as a faculty member at the Institute for Advanced Study at Princeton (1957-67), he played an important role in establishing Kitt Peak National Observatory and in defining NASA's astronomy program. After his return to Denmark in 1967 he became deeply involved in the European Southern Observatory and a very influential president of the ESO Council (1975-77). In his later years Bengt Strömgren substantially promoted collaboration in astrophysics and physics in the Nordic countries as professor and director at NORDITA.

When Bengt Strömgren was approached concerning a meeting on the occasion of his 80th birthday in 1988 he suggested that such a meeting should cover a broad field of contemporary astrophysics and emphasize recent progress and future possibilities rather than past developments. The main purpose of the meeting should be to stimulate the interest of young astronomers and physicists in astrophysical problems. In close consultation with Bengt Strömgren leading scientists were invited to speak on a number of fundamental subjects in astrophysics. In spite of the sad fact that Bengt Strömgren died before the meeting we think that it fulfilled its goals and we hope that these proceedings can serve as further inspiration for new, interesting work in the field of astrophysics.

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