

independence for Australia. We have traced the development of astronomy from colonial to international modern-day science and we place Australian astronomy into a world context. We needed to understand how the influential astronomers of the day operated in holding together their research teams. We thus needed to investigate their leadership styles. It was important also to research the breadth, ie. the range of astronomy undertaken, and the depth, ie the level of specialisation, achieved by astronomers. We have also researched the role played by individuals in the politics & funding of the science. One of the most important factors in the success of Australia astronomy has been the relationship between the public, amateur astronomy groups and professional astronomers. This has been investigated in the project.

In Conclusion. The trend today is for the astronomy community to coordinate its funding and political action to obtain new observatory facilities. The day of the National Facility has arrived. The effect of this process is discussed and we outline why an interest in astronomy in university is growing rapidly again in Australia. The types of tensions that existed between university groups and CSIRO in the 1960's have entirely disappeared and creative relationship exists today.

What the project did not do. It does not document very piece of the historical jigsaw, document every action and event, or study the all the work of every individual, or record all discoveries.

Discussion

W. Orchiston : In your study do you examine the long-term impact that the International Astrographic Project had on the development of professional astronomy in Australia ?

R. Haynes : Yes. It was an important factor in the history of Sydney and Melbourne Observatories.

C.R. Chamblis : What sort of astronomical work is done on Macquaine Island ? Subantarctic islands do not have good weather for normal astronomical observations.

R. Haynes : A combination of cosmic ray and austral astronomy.

P. Brosche : The connection with meteorology seems to have played a major rôle in the earlier years (eg . G. U. Neymayer and Melbourne).

W.E. Howard : Now that astronomy has evolved from optical to radio, to X-ray, UV, space etc., it might be interesting historically to study the differences in approach to astronomy among these subdisciplines and also from country-to-country, as from continent to continent.

R. Haynes : The Australians began in strong isolation but always yearned to be included as respected members of the international community of astronomers. Some were included ; others went about their work in isolation doing their research on their own.

TWENTY-FIVE YEARS AT WESTERBORK

H.R. Butcher, *Kapteyn Astromical Institute, Groningen, NL*

In 1995 the Westerbork Synthesis Radio Telescope (WSRT) will have been in operation for a quarter century. Several events are being planned to celebration this milestone, including the preparation of a history of the facility. Dr. Ernst Raimond (NFRA) will take the lead in writing this history. Here I wish only to note our plans in this regard, and to mention aspects of the history of the facility that may be of particular interest.

As is well known the origins of the WSRT are to be found in Benelux Cross Antenna project of the early 1960's. The initial concept was a single

frequency instrument based on the Mills Cross design, but the collecting area was scaled down by a factor of ten and additional frequencies were added when the possibility of super-synthesis using earth rotation was demonstrated. This collaboration among the Benelux countries was supported by financing from the OECD, but when that collaboration fell apart the Dutch Government assumed full financial responsibility.

The telescope represented the significant step from prototype, university scale, specialist instruments elsewhere, to a well supported, rapid imager having spectral and polarization capabilities. It also pioneered the mode of operation now common for satellite observatories, in which data is taken and calibrated by technicians and provided ready for analysis to researchers.

When the Very Large Array (VLA) began operation in the early 1980's, the response of the Dutch community was to move to a "multi-spectral" mode of research, reducing the annual budget of the WSRT facility by nearly forty percent to finance access to optical, IR and mm observatories at foreign sites, and to provide for the support of research at Dutch universities making use of the available observing facilities.

Today, the telescope is being upgraded to provide frequency agile, tunable receivers, new frequencies of operation, a new broad-band correlator and major maintenance. The goal of this effort is to make the instrument fully competitive with the VLA, as well as to open up research possibilities for studying the early Universe, pulsars and dark matter around spiral galaxies. The techniques of VLBI find ideal nurturing ground in the (internationally oriented) Dutch community and with telescopes such as the WSRT. The NFRA has become host institute for the joint Institute for VLBI in Europe as part of the strategy to exploit the NSRT to its fullest in the coming years.

Discussion

Anonymous : There could be groupings in the future of radio astronomers along the lines of the optical astronomers in ESO.

A poster by **I. Pustyl'nik** (Institute of Astrophysics and Atmospheric Physics, Tartu, Estonia) was given under the title ***George Gamov's Unique Style (in Commemoration of the 90th birthday anniversary of G.Gamov)***.

RECENT WORK ON THE HISTORY OF ASTRONOMY IN INDIA

S.M. Razaullah Ansari, *Physics Department, Aligarh, India*

During the last four years, significant work has been carried out in the history of Indian astronomy. Various groups of Indian scholars (in Aligarh, Bangalore, Calcutta, Madras) and their colleagues abroad worked on various topics. These historical researches could be divided into the well-known three classical periods: The *ancient*, the *medieval* and the *modern* periods. To begin with the latter, noteworthy are the studies on the development of astrophysics (Bhattacharayya 1991) which could be traced back to the solar eclipse observations and of variable stars (1868-1920). The „Indian national renaissance“ which began with the famous work of M.N. Saha (1893-1956)