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Foreword: The Magellanic System

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The Magellanic System, observable only from the southern hemisphere, has traditionally been a niche for Australian telescopes, particularly since the discovery of Magellanic neutral hydrogen in 1953. Now, more than fifty years later, this is no longer the case. Extensive instrumentation is available at other southern sites and there is a variety of powerful space-based instruments. This has opened up the Magellanic system to a dedicated network of researchers all around the world. The diversity of analysis underway, and the scope of astrophysical data available for detailed study is now truly staggering.

The Elizabeth and Frederick White (E&FW) conference on the Magellanic System, funded by the Australian Academy of Science, was held with the purpose of disseminating outcomes of recent Magellanic-oriented research, strengthening existing collaborations and establishing new research directions. The conference took place at the Australia Telescope National Facility headquarters in Sydney, Australia, from 16 to 17 June, 2007 and was attended by around 60 delegates from 11 countries. This meeting was the first Magellanic-focused meeting in Australia, and indeed the world, for more than a decade.

The principal research fields which formed the basis for the conference were:

1. The simulated evolution of the Magellanic System.
2. The development of the stellar component of the Magellanic System and the influence of a metal-weak environment.
3. The distribution of the molecular material in the Magellanic System and its relationship to the stellar population.
4. The properties of the Magellanic interstellar medium.

The new generation of space-based instrumentation, such as the Hubble telescope, the Spitzer IR telescope and AKARI FIR telescope are among those that are now generating enormous quantities of data, involve large collaborations to undertake dedicated analyses. These large projects are able to produce deep surveys of the Magellanic System, detailed proper motion analyses and fully sampled maps of the dust and chemical components. In the following articles, data obtained from space-based instrumentation is analysed in combination with information gained at other wavelengths, including those made with ground-based telescopes, in both the optical and near-IR (e.g. VLT, VISTA, SWOPE and WHAM) and in the radio (e.g. the NANTEN, Mopra and ATCA telescopes). It is through correlation, comparison and analysis of the data produced by these programmes that modern research programmes are able to provide some of the most comprehensive understanding of the current state of the Magellanic system, as well as its likely evolution. At the same time, these programmes expand our understand of forming, poorly enriched and dwarf galaxy systems in general.

Of key importance to understanding the evolution of the Magellanic System is the application of observational data to detailed numerical simulations. Numerical simulations are one of the most powerful tools available for sifting through innumerable evolutionary scenarios. The E&FW conference drew together both observational and theoretical researchers, strengthening what is a crucial relationship. The meeting focused on matters such as the evolution of the system, making use of proper motion measurements from the Hubble telescope, as well as exploring evolutionary scenarios via hydrodynamic simulations, with the intent of converging towards a clearer picture of the extent of interaction of the Magellanic System with our Galaxy.

The new observational findings brought about by the array of new observational facilities, along with the constant improvement in computational hardware and software, have brought about a renaissance of Magellanic cloud research. Such attention is richly deserved — the Clouds are the closest, and most clearly interacting, system to the Milky Way. Nowhere else are we able to get a better chance to observe the evolution of galaxies, or to study the interplay of the interstellar medium and star-formation, than in the Magellanic Clouds.

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