Dublin days: the 2003 NAM

Mark E Bailey and Tom Ray give an overview of the National Astronomy Meeting in Dublin, where record numbers of astronomers went to talk, listen and network.

The Dublin National Astronomy Meeting and UK Solar Physics Meeting 2003 was the largest astronomy meeting ever held in Ireland (with the exception of the IAU General Assembly in 1955). A record number of participants – more than 550 – attended some 65 formal and less formal sessions from 7–11 April 2003. The meeting was noteworthy not only for the quality of the presentations but also for the strong interaction between participants. In part this was no doubt due to the excellent venue, Dublin Castle, at which the meeting was held. Not only was it a lot of science communicated, but opportunities to network, exchange ideas and collaborate were maximized.

The suggestion to host a National Astronomy Meeting in Dublin was first made by David Williams, then President of the RAS, to one of us during the highly successful “Solar eclipse NAM” in August 1999. The Astronomical Science Group of Ireland (ASGI) wholeheartedly welcomed the idea and promptly issued an invitation that was warmly accepted by the RAS Council. The organization of the meeting was delegated to a small Local Organizing Committee (LOC) from five universities and research institutes throughout the island of Ireland. Detailed arrangements for formal and informal sessions were devolved to over 40 individual session organizers, who did such a good job that the LOC was hardly involved. Not only did this encourage the delivery of a world-class scientific programme in areas where members of this community, including solar-system astronomers, have interests of the whole UK and Irish astronomical community, but it also ensured that many more people were actively involved in arrangements for the NAM, and so took “ownership” of the meeting.

Covering the community

We made a conscious effort to encompass the interests of the whole UK and Irish astronomical communities, including solar-system astronomy, star and planet formation, space science, stellar astrophysics, solar physics and the solar-terrestrial relationships, the interstellar medium, galaxies, active galactic nuclei, gamma-ray bursts, particle physics and cosmology. In addition, the NAM provided a forum for an excellent history-of-astronomy session as well as sessions on astronomy education, archaeoastronomy and the usual, and some not-so-usual, lunchtime and evening events.

The proceedings got under way on 7 April with a welcome reception in Trinity College Dublin at which John Hegarty, the Provost of Trinity, spoke. He emphasized the important role played by astronomy in attracting young people to science. This role has become even more important in recent years with the declining number of physics students in British and Irish universities. Like Britain, Ireland is going through the process whereby many physics departments become physics-and-astronomy departments, partly to attract students.

At the opening ceremony, Minister Michael Ahern, from the Irish Department of Enterprise, Trade and Employment, focused on the long-term effects of the Sun on the Earth’s climate as we strive to understand our wonderful universe. He also emphasized the importance of international collaboration as we enter the 21st century.

The following evening the British Council also sponsored a novel event, “Science in the Gravity Bar” for NAM/UKSP delegates. The venue, on top of the Guinness Hop Store in Dublin Castle, was described by astronomy. He also emphasized the importance of international collaboration as we strive to understand our wonderful universe.

Nigel Carson, representing the Northern Ireland Minister for Culture, Arts and Leisure, spoke about the role astronomy plays in culture and the attraction of the subject to the general public. He also stated how proud they are to support and work with Armagh Observatory. Like its sister observatory in the south, Dunsink Observatory, Armagh has a rich astronomical tradition stretching back over 200 years.

Dervilla Donnelly, from the Dublin Institute for Advanced Studies (DIAS), said that she welcomed the major investment being made by the Irish government in university research infrastructure. She noted that astronomers in Ireland have their focus firmly set on becoming partners, with Britain and other European states, in the European Southern Observatory.

Astronomy not useless

After the opening ceremony, delegates were treated to an excellent plenary lecture on the long-term effects of the Sun on the Earth’s climate by Judith Lean (Naval Research Laboratories, Washington). Her talk immediately put lie to the statement, made tongue-in-cheek the night before by the Provost of Trinity, that “astronomy is a useless subject”. Then Jocelyn Bell-Burnell, as President of the RAS, opened an exhibition of David Malin photography, funded by the British Council, at the entrance to the state apartments in Dublin Castle.

The following evening the British Council also sponsored a novel event, “Science in the Gravity Bar” for NAM/UKSP delegates. The venue, on top of the Guinness Hop Store and with panoramic views of Dublin, proved to be the ideal place for Duncan Steel (University of Salford) and Mark Bailey to discuss the “asteroid threat”. Master of ceremony for the evening was the Irish media presenter Eanna Ni Lamhda. The intricacies of the debate were, of course, washed down with large quantities of the local “dark matter”.

This year the NAM public lecture, in association with the Royal Irish Academy, was delivered by Steve Beckwith, Director of the Space Telescope Science Institute. His talk, entitled “The beginning of time, looking back with the Hubble Space Telescope”, attracted a capacity audience of 450 people to Trinity College. Only a few tickets were made available to delegates because the LOC wished to emphasize the true public nature of the event.

At the closing Gala Night Dinner, the RAS President reiterated what was said at the ordinary meeting of the RAS that day, i.e. how
much everyone had enjoyed their stay in Ireland and hoped to come back soon. She also thanked the organizers for their hard work. Several delegates then attempted Irish dancing. We felt, however, that many of them had a long way to go before achieving Riverdance status.

The Dublin NAM, as with previous NAMs, provided a great opportunity for our community to “display its wares” to the people who patiently support our work, often with little detailed understanding of what is done in their name, or why. The press office was busy throughout the meeting and there was a lot of interest from both the Irish and British media. In addition, Dublin attracted hundreds of young astronomers (half the attendees were students) to meet, hear new results first hand and, as was evident from the lively “buzz” during coffee breaks and more or less continuously around the posters, an unparalleled opportunity to network, meet old friends, discuss new ideas and forge new research collaborations.

Any success the meeting may have achieved in the long term should, we feel, be reflected straight back to the respective British and Irish astronomers who actively contributed to the meeting and embraced the warm Irish hospitality and equally (and surprisingly) warm weather. The sponsors (especially the RAS, PPARC, the Armagh Observatory, DIAS and the British Council, and their respective government funding agencies) have been thanked elsewhere; here, we merely note that without such generous support the NAM could not have taken place.

Mark E Bailey and Tom Ray, Armagh Observatory and Dublin Institute for Advanced Studies, on behalf of the LOC.

Data and debate

At a meeting as diverse as NAM, it is hard to attend all the sessions relevant to a particular research field, let alone take the opportunity to explore other areas of interest. What follows is a collection of summaries made of their sessions by the organizers, drawn together to illustrate the scope of the meeting. It is not – and is not intended to be – a complete record of the NAM, nor does it provide an exhaustive breakdown of speakers and posters presented; that information remains on the NAM 2003 website (star.arm.ac.uk/nam2003/) and should be consulted if you want to find out more. But I hope this overview will convey something of the spirit of this extraordinarily successful meeting.

The scientific sessions began with a presentation about “The present state of Cosmic Vision” by David Southwood, Director of Science at ESA. A major overhaul of the ESA space-science programme took place last year and led to a new programme “Cosmic Vision” which packaged missions tightly in a programme of work to 2012. This year it is intended to roll forward the planning to beyond 2020. The programme uses an engineering approach that packs in more missions per euro but which has the inevitable downside of reducing programme flexibility. In robust style, Southwood gave an overview of the present state of the programme, past and present approaches to forward planning, and some appreciation of the impact of the grounding of Ariane 5. The audience appreciated his blunt presentation of the strengths and weaknesses of ESA’s way of working and his assessment of the problems that member states have in undertaking timely payload development, for example. Southwood provided plenty of food for thought: I cannot have been the only person surprised to learn that the combined GNP of ESA’s member states exceeds that of the US, for example.

Topical science results were to the fore in the three consecutive sessions on observational cosmology, which included a diverse mixture of talks on three main themes: galaxy surveys, high-redshift observations, and the cosmic microwave background (CMB). All three of these areas have seen dramatic progress in recent years, culminating most recently with the stunning measurements made by the WMAP satellite of temperature and polarization anisotropy in the CMB. It is interesting to see how the character of cosmological work is changing in the light of these observational advances.

Cosmology comes of age

Observations of the CMB, galaxy clustering and high-redshift supernovae have led to the emergence of a credible standard cosmological model with a flat spatial geometry, a dominant component of cold, non-baryonic dark matter, and a non-zero vacuum energy density causing cosmic acceleration. This basic picture provides a secure framework within which observations can be interpreted and detailed ideas of how galaxy and large-scale structure formed can be developed. A standard paradigm has emerged for the formation of galaxies by the gravitational collapse of the cold matter component, but modelling the behaviour of gas and stars in this framework remains a challenge.

Only a few years ago, interest in cosmographic studies using local galaxy surveys was largely focused on their possible use in pinning down the basic parameters describing our universe. Better constraints on the value of Ω and other important numbers are now available using the WMAP data and supernovae data, so this aspect of local survey work was virtually absent from the presentations at NAM this year. But survey work is still important, as it yields important information about the clustering of galaxies of different types which, in turn, may unlock vital clues about the galaxy formation process. Wide-field observations are also being used to study the gravitational lensing of background objects by foreground mass concentrations. This field is still in its developmental stages, but has already begun to yield exciting results.

High-redshift observations enable astronomers to study the evolution of galaxies and large-scale structure, as well as the properties of the intergalactic medium. The era of 8 m telescopes is upon us and is allowing astronomers to undertake spectroscopic studies of very faint galaxies, including follow-up to observations. In particular, interpretation of the redshifts of objects detected in the submillimetre using SCUBA will lead to important clues about the interplay between dust and star formation during the galaxy formation process in the early universe. The stuff between galaxies, the intergalactic medium, is now also being exposed to detailed spectroscopic study, providing important challenges for theories of structure formation.

The Cosmic Microwave Background has entered a new phase of study owing to the recent release of WMAP data. Interest in this area in the future will not wane, however, and there are many exciting developments in the pipeline. For example, polarization has been detected and measured, but many details of the polarization pattern are not yet understood. These could yield important cosmological clues. Non-primordial sources of temperature anisotropy also promise a rich harvest, especially galaxy clusters observed through the Sunyaev-Zel’dovich effect.

Attention among theorists is likewise turning away from broad-brush phenomenological description towards more detailed understanding of the astrophysics of structure formation. Numerical simulations are set to continue their