Meeting of the Asteroids and Remote Planets Section

held at Wash Common, Newbury, Berkshire on 2007 June 2

The third ARPS Section meeting was hosted by Newbury Astronomical Society, and was held in St Frances de Sales Parish Church Hall, Warren Road, Wash Common, Newbury, Berkshire on 2007 June 2.

The Section Director, Roger Dymock, opened the meeting by welcoming the attendees and outlining the day's programme. He noted that Bob Mizon was present with his Campaign for Dark Skies stand, and that books, surplus to the Section's requirements, were being offered for sale. Non-members present were encouraged to join the Section. Joining details for both the Section and the BAA could be had from the Association's stand run by Ann Davies.

The presentations are available for viewing on the Section's website at **http://homepage.ntlworld.com/roger.dymock/index.htm**

The first speaker was Eamonn Ansbro, who is currently developing a range of telescope facilities at Kingsland Observatory in County Roscommon, Ireland. The focus of his current research, and the subject of his talk, 'An outer solar system high-ecliptic-latitude survey of Edgworth–Kuiper Belt objects', is Edgworth–Kuiper Belt objects (EKBOs).

EKBOs orbit beyond Neptune and offer important clues about the formation of our solar system. Far from resembling an accretion disc leftover, the discovery of some EKBOs with inclinations as high as 40° demonstrates that the full latitudinal extent of the EK belt must be large. Ascertaining the true extent of the inclination distribution of Trans-Neptunian Objects (TNOs) is important for planning TNO surveys. It is vital for determining the total number of TNOs and the past and present mass contained in the EK belt. It will also provide data that may confirm or alter our understanding of solar system formation.

Past surveys of TNOs are probably a poor representation of the true distribution of EKBO inclinations because most were found in surveys centred on the ecliptic. Such surveys were biased towards finding low inclination objects which spend the majority of their orbit close to the ecliptic.

A 0.9 metre telescope at Kingsland Observatory, Co. Roscommon, Ireland is carrying out a two year statistical survey by imaging a range of ecliptic latitudes that are equidistant from each other and measuring the density of EKBOs found at each latitude. Imaging sets of fields spaced uniformly north of the ecliptic will also determine the resonance structure imposed on the belt by the gravitational effects of Neptune. At each longitude, fields at several ecliptic latitudes will map the inclination distribution of the belt, testing competing theories for the formation and orbital evolution of the giant planets.

The survey also includes a search for a hypothetical ninth planet beyond the EKB as a follow-up survey of some 'suspected planets'. The follow-up survey this year will try to detect whether or not this planet exists, based on targets located by prior research.

The second of the morning's speakers was Dr Alan Harris, Senior Research Scientist at the Space Science Institute in Colorado, who spoke on 'Lightcurves and binary asteroids'.

Only slightly more than a decade after the discovery of the first binary asteroid, more than a hundred have now been found by a variety of techniques. Over the same period of time, the number of asteroids with known rotation properties has more than tripled. This has been largely due to the advent of robotic CCD telescope systems, many of them owned by amateur astronomers. Not only have these observers taken the lead in lightcurve observing, they are now the leading discoverers of binary asteroids, through lightcurve observations of eclipses. This explosion in data has gone hand in hand with theoretical work on radiation pressure alteration of asteroid spins (YORP effect) to revolutionise our picture of the physical state and evolution of the small bodies in the solar system.

The 'Photometric Survey for Asynchronous Binary Asteroids' is a collaborative effort between professional and amateur observers, led by Petr Pravec of Ondrejov Observatory, Czech Republic. The first phase of the project, a carefully controlled survey of 200 small asteroids to determine the fraction that are binary, and correct for discovery selection effects, has been completed. The next phase, ongoing, is to re-observe confirmed or suspected binaries at further apparitions to determine pole/orbit orientations of binaries and look for eclipse events at other geometries than previously observed. Further details, along with a listing of participating observers, can be found at **http://www.asu.cas.cz/~asteroid/binastphotsurvey.htm.**

An excellent buffet lunch was provided by Ann Davies assisted by Monica Balstone and Colin Stevens. The afternoon sessions opened with Andrew Elliott, Assistant Director (Occultations), giving an update on 'Techniques of cccultation timing'. The presentation covered the basic techniques of observing, timing, and recording planetary, (+dwarf planetary!), asteroid, and planetary satellite occultations. The 'new order' in equipment and techniques available to the modern well-equipped amateur was discussed. These included telescopes, 'impersonal' timing and recording equipment, accurate time sources and site coordinates, predictions, reduction software, mobile observing, and collaboration in European and worldwide pro-am networks via the internet.

Attendees at the ARPS meeting. *(Photo: Hazel McGee)*

Speakers at the ARP Section meeting. *Left to right, back row*: Roger Dymock, Andrew Elliott, Dr Richard Miles, Peter Birtwhistle; *front row:* Dr Mark Kidger, Dr Alan Harris, Eamonn Ansbro. *(Photo: Hazel McGee)*

The next speaker, on 'Aspects of asteroid photometry: Observing campaigns' was BAA President and Assistant Director (Photometry), Dr Richard Miles. Amateurs equipped with CCD cameras can help push back the scientific frontiers in asteroid research. To do this effectively requires them to unite with others or, at the very least, coordinate their observations with those of others, e.g: Brian Warner's Collaborative Asteroid Lightcurve Link (CALL), Raoul Behrend's CdR-CdL and Petr Pravec's Binary Asteroid Group. This talk recalled how observing campaigns have developed over the years and set out the various options now open to interested observers. BAA activities were highlighted and future observing campaigns suggested, based on the data in the 2007 and 2008 BAA *Handbooks*.

Before the afternoon break Dr Mark Kidger, Community Support Scientist to the Herschel Space Observatory, working at the Herschel Science Centre of ESA's Villafranca del Castillo Satellite Tracking Station in Madrid, gave the first of his two talks, titled 'Catalogues for asteroid photometry – facts and myth'.

The magnitude scale was developed by Ptolemy – a difference of 5 magnitudes being equal to a change in brightness by a factor of 100. Originally 6 orders of magnitude were defined whereas today the range is approximately 55, from the Sun (–26.7) to the faintest objects detected by the Hubble Space Telescope (approximately +29). Amateur astronomers need to be able to calibrate their photometry down to at least mag 18 and preferably fainter. Badly calibrated data is useless, and misleading if published. The aim should be to quote a magnitude in a known system or one that can be converted to same.

Mark emphasised the 'photometrist's commandments' – be systematic, and understand your limitations. The limit to accuracy, no matter how well you calibrate and how good the seeing conditions, is about 3% or 0.03 magnitudes. Even if the error is known to be large it should be quoted. A good signal to noise ratio (SNR) is vital for accurate measurement of magnitude.

Since 1990 Mark has worked with a group of astronomers in Tenerife with the objective of obtaining high precision photometric calibration of stars, using Landolt stars as a reference. The Tycho 2 catalogue shows reasonably good correlation with Landolt stars down to magnitude 10. For best results he recommended using Tycho calibration stars with a V magnitude brighter than 9, a small colour index and within 1 degree of the object being imaged. Calibration stars should be imaged frequently, say every 10 minutes or so and imaging should be not lower than 30° altitude. Results should be transformed to the Johnson V scale. Ideally Landolt stars should be used but there may not be many near to the field of interest. In an ideal world one would use reference stars in the same field of view/image as the asteroid/variable object. Unfortunately such stars are not well calibrated. For example the USNO A2 catalogue is accurate to only 0.17 magnitudes in V, 0.20 in B and 0.15 in R.

Mark's second talk, after the break, was 'The asteroid impact risk reviewed: has it been greatly overestimated?'

Hollywood has done a good job in bringing the impact hazard to public notice but the science in the movies often leaves something to be desired. The extinction of the dinosaurs can be linked to the Yucatan impact but the Deccan Traps volcanic eruption may also have played a part. Although the impact rate is much lower than it was, the danger is still there. 2008 is the centenary of the Tunguska event and it is expected that this will bring the subject to the fore once again. In 2004 December a conference, organised by the International Council of Science and attended by a multi-disciplinary group of 50 scientists, was held at the Tenerife Science Museum. Its aim was to discuss all aspects of the asteroid threat. Just three weeks afterwards the Asian tsunami struck causing significant loss of life and considerable damage, indicating just what an ocean impact might do.

The potential threat is indicated by the 138 asteroids on the JPL Current Impact Hazard List of which only five have been observed recently. The combined impact probability of all these objects gives a 1% chance of an asteroid hitting the Earth in the next century. However 70% of that probability can be assigned to just two objects, both of which are small and may not penetrate the atmosphere to reach the Earth's surface.

The last speaker of the day was Peter Birtwhistle, Assistant Director (Astrometry), describing 'Tracking Near Earth Objects'. After describing his observatory Peter explained how he used the Minor Planet Center's NEO Conformation page (MPC NEOCP) to follow up recent discoveries. He explained that newly discovered asteroids can be difficult to find or lost if they are Very Fast Moving Objects (VFMOs) or there is a delay in their appearance in the NEOCP. As do many amateurs Peter uses *Astrometrica* software. This enables faint objects to be detected by stacking multiple images and outputs data in the format required by the MPC. His technique for capturing images of VFMOs is to take many short exposures of a number of fields spanning the predicted position of the object. Timing is all important for accurate astrometry particularly of VFMOs. Synchronising the PC's clock using *Dimension 4* freeware is Peter's preferred method but he noted that GPS receivers are also suitable timekeepers. He closed his presentation by mentioning that distant artificial satellites make good targets for practising VFMO imaging.

Roger Dymock closed the meeting by thanking the speakers, the attendees and those who had worked hard to make the day a success: Ann Davies, Monika Belstone and Colin Stevens, catering; David Boyd, technical support; Bob Mizon, Campaign for Dark Skies stand; Jean Dymock, reception; and Hazel McGee, photographs and assistance with the meeting report. Total attendance was 39 and feedback from the attendees indicated a high level of satisfaction with the event.

Roger Dymock, *Director*

Obituary

Frank M. Bateson OBE FRAS FRASNZ, 1909–2007

Frank Bateson was one of the world's greatest contributors to the study and science of variable stars, providing leadership to the field in the Southern Hemisphere for 78 years. The son of Charles and Alice Bateson, he was born on 1909 October 31 in Wellington, New Zealand. Frank was educated at the Hurworth Preparatory School in Wanganui, NZ and at Scots College, Sydney, Australia.

He made his first observations of meteors in 1923 (Donovan Prize, 1923) and variable stars in 1924 (Donovan Prize, 1924). In 1927 he joined the New South Wales branch of the BAA, was lent a small refractor and allowed to use the refractor at the Sydney Observatory. Bateson left school and started working in 1925 in business administration and accountancy, a career that he followed for most of his working life. He returned to New Zealand in 1927 and founded the Variable Star Section (VSS) of the NZ Astronomical Society (later the Royal Astronomical Society of New Zealand). He served continuously as Director of the Section for the next 78 years. In 1931 he married Doris McGoldrick and they had two daughters, June and Audrey. Throughout these years Bateson continued his observation of variable stars and worked tirelessly to expand the VSS with its network of observers. During the Depression, the Batesons moved first to Auckland and then in 1937 to a job in Whangarei which allowed plenty of time to devote to astronomy.

Bateson (right) with veteran observer Albert Jones at the former's retirement party on 2004 December 4. *(Photo by John Toone)*

After the end of the war in 1945, Bateson moved to the Cook Islands to manage a trading company. From the tropics he continued his own observations (now with an 8-inch refractor) while also directing the New Zealand VSS. Under his leadership, the number of active observers increased as did the number and types of variable stars covered, most notably dwarf novae. He established close working links with professional astronomers and provided them with data obtained through the extensive network of observers. He contributed at least three articles to the BAA *Journal* around 1948–1953.

In the late 1950s he began promoting his vision of a professional observatory in New Zealand in collaboration with Frank B. Wood of the University of Pennsylvania. Bateson conducted an extensive site-testing survey and recommended a site at Mount John near Tekapo. The Mount John Observatory was established with the University of Canterbury in 1965; Bateson served as Astronomer-in-Charge until his retirement in 1970.

Bateson's research in variable stars has achieved international recognition, particularly from professional astronomers who made extensive use of the results he collated. Approximately one million observations have been recorded. Over 1000 charts of southern variable stars have been published (most with Mati Morel). In addition, he has personally authored over 300 scientific papers.

Frank Bateson was elected a Fellow of the Royal Astronomical Society of New Zealand (RASNZ) in 1963 and at his death had been a member of the Society for over 80 years. He served on the RASNZ Council for many years and was a past President (1966–'67). He was also an honorary member of numerous astronomical societies both within New Zealand and around the world.

Over his long career, Bateson was honoured by many major prizes and awards. He was elected to full membership in the International Astronomical Union and served as the first NZ representative. He received the Jackson–Gwilt Medal and Gift of the (UK) Royal Astronomical Society in 1960 and an honorary doctorate from the University of Waikato in 1979. He was awarded the Order of the British Empire (OBE) in 1970 for services to astronomy, and the Amateur Achievement Award of the Astronomical Society of the Pacific in 1980. The asteroid 2434 Bateson was named in his honour. With justification, he has been widely recognised as the father of modern New Zealand astronomy. His autobiography *Paradise Beckons* was published privately in 1989.

In 2004, at a meeting to honour Frank's retirement, John Toone, the BAA VSS Chart Secretary, presented Frank with a plaque of the very first observation he submitted to the BAA VSS in 1926. Altogether, Frank made approximately 150,000 observations of variable stars and historically he was the second person to achieve the 100,000 observations milestone.

Frank Bateson died peacefully in Tauranga on 2007 April 16 in the company of his family.

Grant Christie

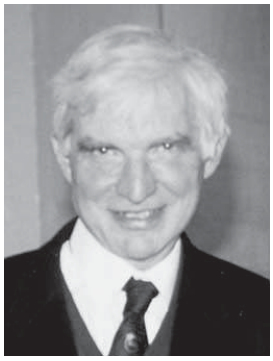
Stardome Observatory, Auckland, New Zealand
(contributed with additions by **Roger Pickard**)

Obituary

John Charles Clint Larard, 1937–2007

With the death of John Larard on 2007 May 25 at a nursing home in Camberwell, we have lost one of the great classical visual observers of our time.

John was born on 1937 April 17, his birth registered in Edmonton District with Clint adopted from his mother's maiden name. He attended Haileybury School. His interests were many, including a passion for classical music, but observational astronomy was his main hobby.



He was a long-time member of the Societé Astronomique de France, which often appeared on his headed notepaper during correspondence, and also of the Astronomical Society of India. He was elected a member of the BAA on 1957 November 27 (appropriately the year of the start of the Space Age) and as a fellow of the Royal Astronomical Society on 1967 March 10. In volume 75 (pages 294–295) of the BAA *Journal* he wrote of his double star survey. The RAS library records also show a 'celestial survey' by John was lodged with them.

He became known to the author as the first secretary of *The Casual Astronomer,* which would later become known as *The Astronomer*. The records show he attended the inaugural meeting of this group at Caxton Hall on Thursday 1964 April 2, where he and the founding editor, Jim Muirden, discussed the production of a rapid publication magazine which would provide vital feedback to active

observers. Not only did John attend to all administrative matters but he was a very active observer himself and showed great encouragement to others.

His legendary contribution to *The Astronomer* was a series of articles entitled 'From the Night Sky', which grew out of a natural love of observing the deep sky and double stars. The Fry 0.20m refractor at the University of London Observatory, Mill Hill, was at his disposal from 1960 to 1983 following arrangements made by Dr Derek McNally, and these observations provided regular material for his articles. John recounted in a letter of 1998 July 16 (to which he added the time of writing, 18h 46m UT, in his typically precise way), that these observing sessions were amongst the happiest days of his life.

This collection still serves as a reminder to all observers that there is a great deal more which can be seen in such objects as star clusters than from a mere glance in the eyepiece. His advice to everyone, including myself, was to spend long periods studying detail at all available magnifications and to attempt to convey all this on to paper. His articles had a particular effect on the reader who could share the excitement of detecting a faint nebula or splitting a close double 'through John's eyes'.

His efforts to spread the word in visual observing were extended to the Southern Astronomical Society (named after Sir James South) which issued a quarterly bulletin in the 1980s. During occasional spells in hospital John's efforts would even extend to the preparation and editing of newsletters for the staff and fellow patients! He was a great believer in the printed, or should I say typed and duplicated, word.

John Isles, well known to BAA members, recalls that John was his first mentor in astronomy and that he used to live in New Cross, South London, in the street behind his childhood home. John Isles had his first views of double stars and deep sky objects through John Larard's 3-inch refractor and made his first estimates of telescopic variable stars with it. John Larard's observing books were modelled on those of the legendary T. W. Webb, and many people adopted this format for their own observing logs.

An example of his meticulous and thought provoking writing appeared in the *Notes of the Southern Astronomical Society*'s Issue 56 in Nov–Dec 1985. John writes 'There comes a time when each person must rest and put down the tools. Stargazers, or Astronomers if you prefer, have urgent, nightly business. When they finish the night, down must be put the Star Atlas and its BD, the eyepieces (×168 among them?) and observing book. The clock is stopped on the telescope and the dome poises to be shut....'.

Observational astronomy techniques have changed since those times but the records left by John and the enthusiastic help given to others live on. We extend our sympathy to Katherine on her sad loss.

Guy M. Hurst

(Photograph of John Larard by Melvyn Taylor)