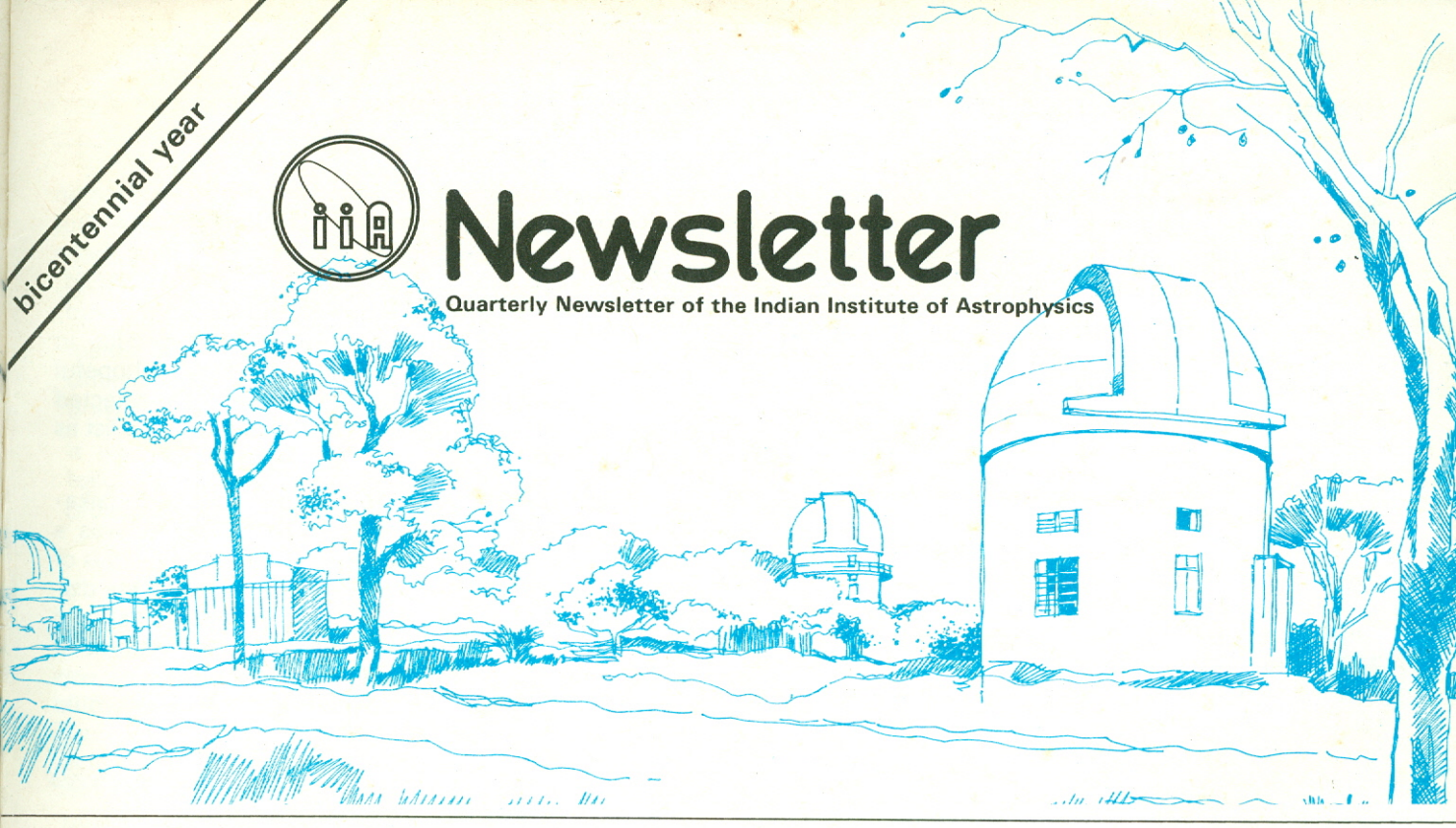
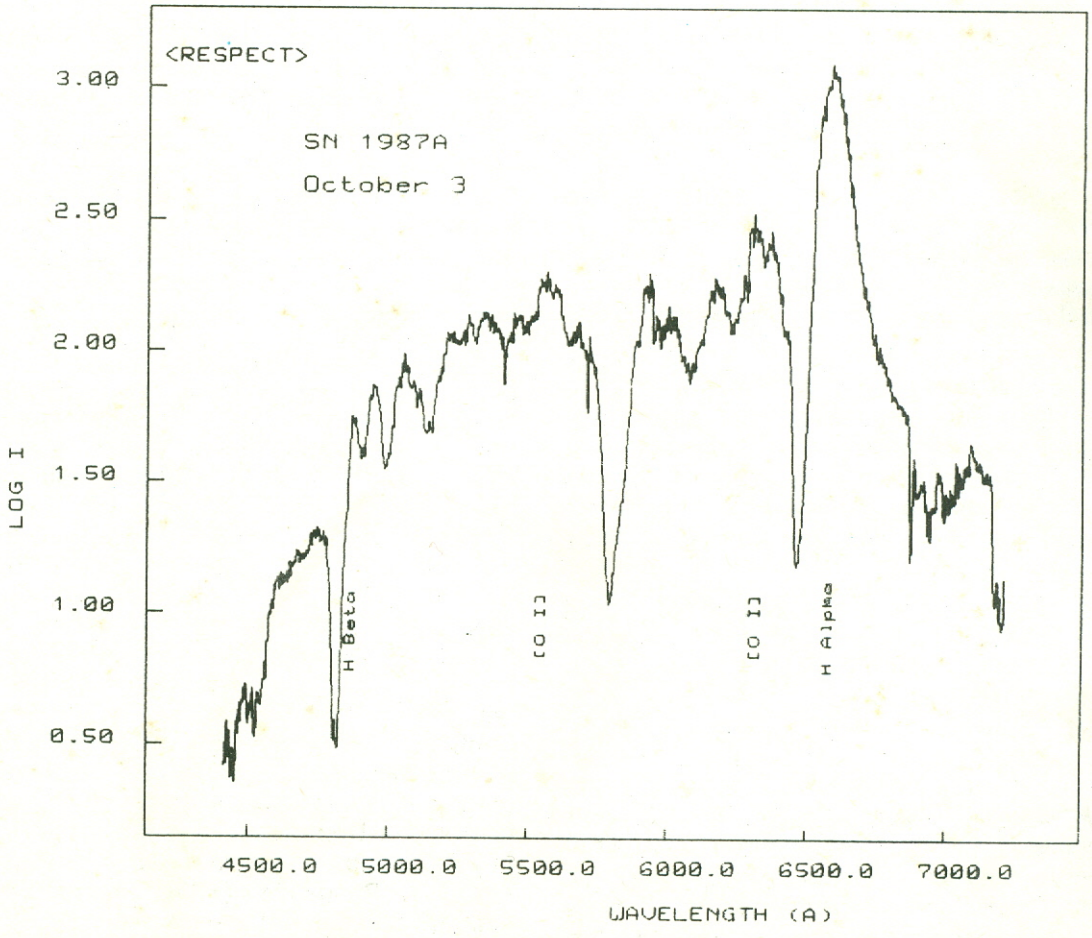
bicentennial year

Newsletter

Quarterly Newsletter of the Indian Institute of Astrophysics



Volume 2 Number 4 October 1987



Spectrum of SN 1987 A obtained on 1987 October 3. The spectrum was not corrected for instrumental response. Hα, Hβ, and [O I] 5577, 6300, 6363 Å are clearly seen.

Forbidden lines in SN 1987 A

Supernova 1987A is once again visible from Vainu Bappu Observatory, Kavalur, after a period of nearly five months. Regular spectroscopic observations have been resumed since 1987 August 30.

The spectrum has considerably changed since it was seen last. The emission components of lines have narrowed down. The infrared triplet of Ca II was seen as a single broad emission complex till 1987 April 1; now it is split into two components. The lines of Fe II which were characteristic of the earlier spectra have become very weak.

The forbidden emission lines are becoming stronger continuously. Striking examples are [Ca II] 7323 Å, [O I] 5577, 6300 and 6363 Å. The line of [Ca II] 7291 Å, which is expected to be 1.5 times stronger than the 7323 Å line has been eaten away by the atmospheric absorption band due to water vapor. The appearance of [O I] lines shows that the density of the envelope is now lower than about 10^8 atoms cm^{-3}.

The P-Cygni absorptions of Balmer Hα and Hβ lines of hydrogen have once again become strong; these lines are now excited collisionally.

The Obsevations of SN 1987 A would continue from V B O until the supernova would set with Sun in 1988 April.

from the director

In the project Kalki, 30 asteroids have been detected on the Schmidt plates taken during 1987 March–June. Out of these, four appeared to be new and have been assigned temporary designations 1987 FY1, 1987 FZ1, 1987 HQ2 and 1987 HR2 by the International Astronomical Union. More observations will be needed to compute their precise orbital elements. We are hopeful that some of these, as well as new objects to be detected during future observing runs will be added to the list as new discoveries.

Two national scientific meetings were held at Kodaikanal during 1987 August–September. The first was a workshop on instrumentation where the possibilities of new observational experiments in astronomy were discussed in detail. The other was the second national workshop in solar physics, where the present status of our efforts in solving problems in solar physics was reviewed. Proceedings of both the workshops would appear in print in near future.

J. C. Bhattacharyya

National Workshop on
Astronomical Instrumentation in India: Past, Present and Future

As a part of its bicentennial programme, Indian Institute of Astrophysics organized this workshop at Carlton Hotel, Kodaikanal, during 1987 August 10–12. The workshop was dedicated to the memory of late Professor M. K. Vainu Bappu, who would have been sixty on 1987 August 10.

The Workshop was inaugurated by Professor M. G. K. Menon, and began with a brief résumé of the Growth of Modern Astronomical Instrumentation in India (R. K. Kochhar, IIA), History of the Discovery of Speckle Phenomenon in India (S. Ramaseshan, Raman Research Institute), and Pre-telescope Instrumentation in India (K. D. Abhyankar, Osmania University).

The subject was guided into the present through a summary of Current Astronomical Instrumentation—A Global view (T. P. Prabhu, IIA). The existing facilities at various centres in India were then summarized by N. B. Sanwal and R. Swaminathan (Japal-Rangapur Observatory), T. N. Rengarajan (Tata Institute of Fundamental Research—Far-infrared Astronomy), V. R. Venugopal (TIFR-Radio Astronomy Centre), P. V. Kulkarni, J. N. Desai and U. C. Joshi (Physical Research Laboratory), Arvind Bhatnagar (Udaipur Solar Observatory), M. C. Pande (U. P. State Observatory), Ashok Bhatnagar (Positional Astronomy Centre), Jagdev Singh and J. C. Bhattacharyya (IIA).

The last day of the workshop was highlighted by the panel discussion on future plans on instrumentation at various astronomical centres. Professor R. R. Daniel chaired the session. Several proposals were critically discussed during the session.

K. R. Sivaraman (IIA) and M. C. Pande (UPSO) proposed setting up solar vacuum telescopes at their respective observatories. K. S. Balasubramaniam (IIA) proposed fabrication of a vector magnetograph, whereas Arvind Bhatnagar (USO) proposed a video magnetograph. M. C. Pande described the UPSO 4-m telescope project. Ashok Pati (IIA) proposed a multiple application system for faint objects (MASFO), and N. Kameswara Rao (IIA) proposed a coudé high-resolution spectrograph, both for the 2.3-m Vainu Bappu Telescope. J. N. Desai described a high-resolution differential F-P interferometer under development at PRL which will be able to eliminate the effect of atmospheric scintillation. R. Swaminathan described the plans at OU for an echelle spectrograph. U. C. Joshi described the plans at PRL for an IR polarimeter. P. V. Kulkarni (PRL) proposed a Doppler imaging system. K. V. K. Iyengar (TIFR) proposed sub-millimetre interferometry from Leh. T. N. Rengarajan (TIFR) stressed the need for a national data centre for astronomy.

H. S. Mahra described the efforts of UPSO towards the survey for an astronomical site for the 4-m telescope. Several participants, particularly R. K. Kochhar (IIA), stressed the need for a broad-based national survey for the best astronomical sites in the country.

S. M. R. Ansari (Aligarh Muslim University) spoke on promoting astronomy at the universities, and V. R. Venugopal spoke on astronomical manpower requirements and training. A. G. Kulkarni (Jaipur Planetarium) offered his services to promote astronomy in selected universities.

It was agreed that the ideas and proposals will be followed up, particularly with a view to helping their promotion by funding agencies.

The proceedings of the workshop are planned to be published.

Professor M. G. K. Menon also inaugurated an exhibition on 1987 August 10. The exhibition depicted the chequered history of Madras and Kodaikanal observatories through pictures collected by R. K. Kochhar, some of which were displayed for the first time.

Professor J. C. Bhattacharyya planted a sapling of *Brachychiton Acerifolia* at Kodaikanal observatory, to commemorate the occasion.

The participants of the workshop were also taken around the observatory and its museum.

Advent of Solar Physics in India

Although spectroscopic and photographic techniques had been used in India at the 1868 and 1871 solar eclipses, it was the 1874 December 9 transit of Venus over the solar disc that led to the beginning of solar physics—or physical astronomy as it was then called—in India.

On 1872 March 21 the Astronomer Royal, Sir George Biddell Airy, wrote to Col. James Francis Tennant of the Royal Engineers—and not to the Madras Astronomer Norman Robert Pogson—asking him to observe and photograph the transit. Tennant was an accomplished astronomer and had been in 1859–1860 the director of Madras Observatory and would have continued if the Government had permitted him to draw his Major's salary.

The British Association for the Advancement of Science also passed a resolution urging the Indian Government to make arrangements for the observation of the transit.

A photoheliograph was eventually ordered from Mr John Henry Dallmeyer (1830–1883). Since there was not enough time to make an entirely new one, Dr Warren de la Rue was persuaded to give up the one he had commissioned for his own use.

The photoheliograph had a 4 inches aperture lens and gave a 4 inches diameter image of the sun on 6 inches square plates. Precisely similar to the five instruments made by Dallmeyer for the British transit of Venus expeditions, it was set up at Roorkee by Tennant, and used by Captain J. Waterhouse, superintendent of mathematical instrumentation department, Survey of India, Calcutta, who took over 100 photographs of the solar disc while the planet was on it, besides five showing the egress of the planet from the sun.

The photographs were sent to Greenwich and reduced—along with others—by Captain G. L. Tupman who wrote (*MNRAS* **38**, 1878, 509)

> 'There is only one really sharp image in the whole collection, including the Indian and Australian contingents, and that is one of Captain Waterhouse's wet plates taken at Roorkee . . .

Tennant suggested setting up of a solar observatory at Simla with the transit of Venus instruments, but the suggestion was turned down and the instruments were asked to be returned to England.

Where Tennant failed, Joseph Norman Lockyer succeeded.

Solar Photography

In 1870 a Royal Commission on Scientific Instruction and Advancement of Science had been set up in England with Duke of Devonshire as the chairman and Joseph Norman Lockyer as the secretary. In its eighth and final report submitted in 1875 the commission recommended—largely due to persuasion by Lockyer and Sir George Airy—the setting up of solar physics observatories not only in England but also in various parts of the empire, especially in India.

Again in 1876, a large and influential deputation from the British Association called on the Duke of Richmond and Gordon, Lord President of the Council on Education, and urged action on the 1875 recommendations.

Then again in 1877 a memorandum was presented by a large number of eminent men of science on the same subject, basing their appeal on the fact that in the opinion of a considerable number of scientists, there was a more or less intimate connection between the state of the surface of the sun and the meteorology of the earth. These memorialists called special attention to the fact that recent independent investigations by several persons (among whom was Lockyer) have led to the conclusion that there was a similarity between the sunspot period, periods of famine in India, and cyclones in in the Indian ocean.

Since all these efforts failed to produce any results in the direction of setting up of observatories outside England, Lockyer appealed directly to Lord Salisbury, then Secretary of State for India, who had visited Lockyer's laboratories at South Kensington a number of times and shown great interest in the work. *(to be continued)*

R. K. Kochhar

of human elements

Pipe-smoke Spectra

Another observer, lost in dreams of a greater instrument, sometimes lost the star as he puffed huge clouds of smoke from one of his pipes. This was Professor Heber D. Curtis, the director, who died about four years ago. Curtis' pipe was everywhere at once. He kept several of them, with cans of tobacco, scattered strategically about the observatory and the residence. If he left his pipe at the drawing board where he was designing the 96-inch reflector, he would find another one in his office. It could be laid aside when he went over to his home, for there would be another on the hall stand, and it soon would be in action. At the telescope, the clouds of smoke were so dense that some astronomers of the staff attributed any unfamiliar spectral feature to absorption through the equivalent of several atmospheres of tobacco smoke.

Sky & Telescope (1946), **5**, No. 55, p. 15.

out of context

Our solutions are unsteady, . . .

Mon. Not. R. astr. Soc. (1987) **226**, 810.

* *

. . . . champagne flows are not likely to play a major role. . . .

Ibid., 860.

* *

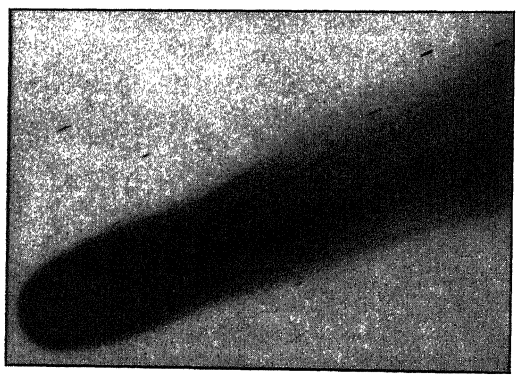
Photography, of course, was used to make pictures of the sun immediately after its discovery.

A History of Astronomy, (1961)
George Allen & Unwin Ltd, London, p. 405.

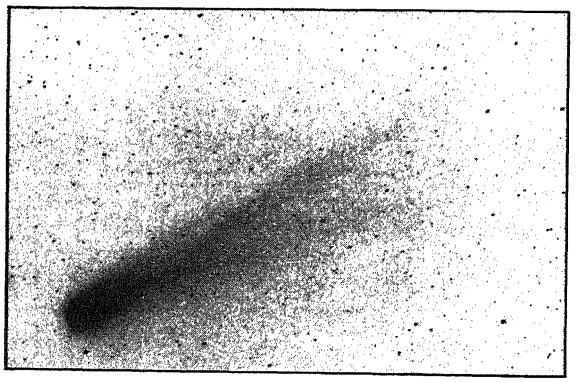
* *

. . . the nearness of the LMC provides astronomers "with a unique opportunity to study a supernova with lots of instruments. . . ."

Astronomy (1987) **15**, 95.



Comet Halley 1910
Photographed from Kodaikanal Observatory on 1910 May 13.



Comet Halley 1986
Photographed from Vainu Bappu Observatory on 1986 March 8.

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