

## Preface

IAU Colloquium 184, *AGN Surveys*, was hosted by the Byurakan Astrophysical Observatory on 18-22 June, 2001. It was dedicated to the memory of Benjamin Markarian. He was a world-recognized pioneer in systematic surveying for UV-excess galaxies. His vision, physical insight, consummate skill as an observer, and exacting standards served as an example to his colleagues and a model for subsequent major survey enterprises.

The Byurakan Astrophysical Observatory was founded in 1946 through the initiative and vision of its first director, Academician of the National Academy of Sciences of Armenia, Victor Ambartsumian. Ambartsumian was Markarian's thesis supervisor and invited him at that time to join the scientific staff as a Senior Research Associate. In 1950, Ambartsumian and Markarian were awarded the USSR State Prize for their study of stellar associations, and related work on star formation and distribution of interstellar dust. Markarian served as the project scientist for the 1-m Schmidt telescope, put into operation in 1960.

The Byurakan Schmidt telescope was built because of its potential for systematic pursuit of two related phenomena in galaxies: nuclear activity and powerful star formation. Ambartsumian charged Markarian with the responsibility for carrying out a slitless spectroscopic survey for galaxies with UV excess and/or strong emission lines. The First Byurakan Survey demonstrated beyond doubt the effectiveness of the thin objective prism over a wide field of view for isolating such galaxies. In 1968, Khachikian and Weedman made the first spectroscopic observations from Markarian's lists, generating tremendous excitement with the rich return of active objects and effectively doubling the number of known Seyfert galaxies. They were subsequently able to use their spectral studies to develop the initial classification system for Seyfert galaxies.

The scientific realization of Markarian's efforts came in the First and Second Byurakan Surveys. It is widely known that these surveys covered large, contiguous areas, and pushed the limits of photographic sensitivity to generate large, statistically significant samples of active galaxies in the local universe. The First Byurakan Survey was carried out from 1965-1980 by Markarian, together with the late Valentin Lipovetsky and Jivan Stepanian. The Second Byurakan Survey used Kodak fine-grained emulsions for greater depth, and was completed over the period 1974-1991 at first by Markarian and J. Stepanian and then with V. Lipovetsky, L. Erastova, V. Chavushian and S. Balayan. A major contribution of the SAO 6-m telescope was the spectroscopic investigation of Markarian galaxies.

Markarian clearly commanded the respect of his observatory colleagues and professional peers. Excerpts from contributed reminiscences reflect that view:

"We can truly credit Markarian and his galaxies with providing the link between AGN and quasars, now such a crucial part of our 'unified schemes' for

understanding objects throughout the Universe...His credentials as a brilliant astronomical observer are well known, but I also want to attest that he was a kind and gentle person, with a very broad range of interests outside of astronomy.”

– Dan Weedman

“He developed a new very effective way of searching of active extragalactic objects, but this is not just a realization of a successful idea, it is a titanic manual job, a tremendous volume of which is even hard to imagine, and also an inexplicable paradoxical intuition of a researcher behind it.” – Anatoly Zasov.

This IAU Colloquium was a fitting tribute to the heritage of AGN surveying at the Byurakan Observatory. It brought together those working on major surveys for AGN, now expanded to scales only dreamed of in the days of photographic plates and visual inspections. Full confrontation of the AGN phenomenon and related starburst activity requires samples collected from radio, IR, optical, and X-ray surveys. The excitement of the meeting is reflected in the reviews and contributions, with early looks at the implications of 2MASS, SDSS, and hard X-ray surveys.

Large-scale surveys of AGN broadly address the accretion history of the Universe. These data are uniquely valuable to a range of key current questions in astrophysics: To what degree have AGNs produced the diffuse radiation backgrounds from X-ray through far-IR? To what extent are heavily obscured AGNs major constituents of the total population, and how does that fraction change with cosmic time? How much of the range of observed AGN phenomena arises from changes in viewing angle vs. genuine diversity in circum-nuclear structure? How are the formation and evolution of supermassive black holes and their activity related to the formation and evolution of their host galaxies? What is the nature and formation of double and multiple nuclei in active galaxies?

The volume is organized, for convenience, by the primary energy band of the investigations reported. The deep inter-relationship of the sections testifies to the inherently multi-wavelength nature of the exploration of the AGN phenomenon. This topic continues to attract vigorous intellectual attention, a tribute both to its challenge and to its heritage.

We are grateful to the Scientific and Local Organizing Committees for their generous efforts in making the Colloquium a success and a pleasure.

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