

PREFACE

Stellar flares represent one of the most challenging problems of contemporary astrophysics. Both solar and stellar observations have shown the flare phenomenon to be very complex, and in recent years important progress has been made from simultaneous observations over wide wavelength ranges. Some similarities exist between solar and stellar flares, but important differences have also been established. Such topics, as well as theoretical aspects, were discussed in detail at the Palo Alto IAU Colloquium No. 104, *Solar and Stellar Flares*, in 1988.

Another approach to the study of stellar flares is through observations of flare stars in physical systems. The possibility of detecting flare stars in star clusters and associations with wide angle telescopes have allowed observations of systems with quite different ages. The classical works of G. Haro and V. A. Ambartsumian demonstrated the evolutionary nature of the flare phenomenon. Flares occur at the earliest stages of dwarf star evolution. The photographic observations of flare stars in systems of different ages turned out to be significant not only for the evolutionary study of flare stars, but also for the study of their physical nature. This observational fact was conditioned by very large diversity of flare star luminosities, i.e. of scales of flares produced by them and by peculiarities of stellar flares observed in star clusters and associations.

The IAU Symposium No. 137, *Flare Stars in Star Clusters, Associations and Solar Vicinity* in Armenia was the first IAU conference to bring together the scientists working in both fields: on the UV Ceti stars in the solar vicinity, and on the flare stars in the star clusters and associations.

In fact, it was the fourth Symposium held at Byurakan devoted to flare stars. The first three were held in: 1976 – *Flare Stars*, 1979 – *Flare Stars, Fuors and Herbig-Haro Objects* and 1984 – *Flare Stars and Related Objects*.

The decision of the IAU Executive Committee to hold this Symposium in Byurakan can be considered as a sign of recognition for the significant contribution by the Byurakan Observatory to the study of stellar physics and evolution, particularly, the study of flare stars.

This IAU Symposium was sponsored by the Armenian Academy of Sciences and by the Byurakan Observatory, who paid all expenses for the foreign participants inside the Soviet Union. Additional travel grants were provided by the IAU.

The present Symposium was planned for May, 1989 but because of the tragic earthquake in Armenia it was postponed to October, 1989. It was held on October, 23-27, 1989 at the Byurakan Astrophysical Observatory. There were 93 participants from 19 countries. Unfortunately, some of the USA scientists who were invited could not come to Byurakan because of the earthquake in San-Francisco.

The official opening of the symposium took place in Conference-Hall of the Byurakan Observatory, where all sessions were held. The participants were welcomed by academician V. A. Ambartsumian, the President of Armenian Academy of Sciences, Miss G. V. Danielian, the Representative of the Local Government and Dr. E. E. Khatchikian, the

Director of the Observatory. Dr. B. R. Pettersen presented the congratulating telegram on behalf of IAU General Secretary Dr. D. McNally.

The Scientific Organizing Committee for the Symposium was chaired by V. A. Ambartsumian. The members of the SOC were P. F. Chugainov (USSR), D. S. Evans (USA), G. Haro (Mexico), I. Jankovics (Hungary), K. Kodaira (Japan), L. V. Mirzoyan (USSR), B. R. Pettersen (Norway), L. Rosino (Italy) and M. K. Tsvetkov (Bulgaria). During 6 sections of the Symposium 8 invited and 42 oral papers were presented including 20 poster presentations.

In addition to different aspects of flare stars several papers were devoted to the study of related objects (T Tauri stars, Fuors (objects like FU Ori), Herbig-Haro objects etc.). They suggest a similarity in physical nature among several non-stable phenomena – flares, fuor-like changes, irregular variations etc. It is most likely that the different manifestations of stellar activity are the results of release of some unknown kind of energy in outer layers of young stars. Further study of flare stars and related objects will contribute to a better understanding of stellar activity, in particular to stellar flares.

The main achievement of the Symposium, perhaps, was the presentation of the flare star problem from both a physical and an evolutionary aspect. The discussion showed that the interaction between investigators working on flare stars in star clusters and associations, and on the UV Ceti stars in solar vicinity, can be significant for the understanding of the physics and evolution of red dwarf stars.

The weather, as is usual for this time of the year in Armenia, was sunny and warm. The participants of the Symposium enjoyed many social events and received lasting impressions of more than 3000 years of Armenian history and contemporary Armenia. They could visit many interesting museums, ancient citadels and temples (Garni I - III Cent. B.C.), Matenadaran-Institute of ancient manuscripts, cathedral church (IV cent. A.D.) in Echmiadzin where they were received by Vasgen I - the Katolikos of all Armenians as well as the the memorial of the world-wide known genocide of 1915. The concert of the Armenian State Dance assembly directed by V. Khanamirian in the Aram Khachaturian Concert-Hall in Yerevan was impressive.

At the time of the Symposium conditions in Armenia were very difficult: a blockade of all railway and auto roads connecting Armenia with the world was in effect. In despite of such unfavorable environment, excellent conditions of work were provided to all participants, helped by the warm hospitality of the Armenian astronomers.

To all of them we would like to express our heartiest thanks.

LUDVIG V. MIRZOYAN, BJORN R. PETERSEN
and MILCHO K. TSVETKOV

February 1990