PREFACE

This Conference was inspired by the original idea of having an IAU meeting on Cataclysmic Variables. Although CV meetings occur steadily and cyclically as outbursts in the Dwarf Novae, the previous to this IAU sponsored meeting of such kind was back in 1995. However during discussions among members of Scientific Organizing Committee we came to the conclusion that simultaneous discussion of broader phenomenon, known as close, interactive binaries is needed in the era when exciting data streaming from new modern telescopes and over wide range of wavelengths starts to appear. Thus, the title of the conference and accordingly topics were enhanced to embrace all kinds of interactive compact binary objects.

Close Binaries comprise a compact and easily distinguishable group of objects. They are also a perfect laboratory for the study of a wide variety of exciting astrophysical processes, such as the following: Roche lobe overflow, the effects of irradiation on the rate of mass transfer and possible feedback effects, orbital evolution by magnetic braking and by emission of gravitational waves, dynamics of inter–object streams, impact and overflow of streams on accretion disks, turbulent and magnetohydrodynamic transfer of angular momentum within disks, local and global instabilities in disks, including tidal stresses, the growth of eccentric and tilted modes in disks, disk chromospheres and coronae, the dynamics and magnetodynamics of winds from disks, the thermal structure of winds, boundary layers between disks and stars, the effect of accretion heating, angular momentum transfer and deposition of accretion energy and accreted gas of different chemical compositions into the envelope of a rotating white dwarf, nonequilibrium nuclear reactions during thermonuclear runaways, the possibility of some cataclysmic variables being supernova progenitors, the hydrodynamics of asymmetrical explosive ejections, the interaction between ejecta and a companion star, the desynchronization of polars during nova explosions, the contribution of novae ejecta to the composition of interstellar medium, novae as gamma-ray line sources, the interaction between plasma and magnetospheres, the structure of magnetic fields in white dwarfs, the dynamics of the interaction of the magnetic moments of two stars, the effects of mass loss on the thermal equilibrium of a donor star, etc. The presence of X-Ray binaries and cataclysmic variables in globular clusters, the compact binaries as the likely progenitors of the cosmologically critical Type Ia supernovae, the rate of nova explosions, and the rate and chararcteristics of extragalactic novae underscore the role of compact binaries in probing stellar systems and galactic structure in the galaxy and beyond.

The Compact Binaries (CBs) are a well defined group of objects, but they are divided into a dozen types and classes depending upon the masses of the components, mass transfer rates, magnetic field strengths, etc. Some stand out by their observational characteristics but are still pending appropriate explanation. In recent years, the zoo of CBs were enriched by new classes of objects (X-ray transients, supersoft X-ray sources and others), some of them luminous enough to be found in neighboring galaxies. The study of common characteristics and the reasons for the differences between different types of objects leads to a better understanding of the nature of these interesting species.

The introduction of a number of large optical telescopes in recent years and of UV and X-ray telescopes in orbit with unprecedented high resolution and sensitivity is providing new impetus for the study of CBs. Lots of new results from these facilities have started to appear in the literature that may lead to a qualitative breakthrough.

Better knowledge of close binaries facilitates our understanding of a broader range of astrophysical objects, from disks and angular momentum loss in protostars to instabilities in the disks of active galactic nuclei.

Finally, the evolution of these objects is closely associated with such important topics as the age of the

Galaxy, hidden mass, and other cosmological problems.

We hope you will find the proceedings of this conference useful and timely.

The Scientific Organizing Committee of the IAU Colloquium 194 was comprised of Gaghik Tovmassian (Mexico, chair), Jorge Casares (Spain), Phil Charles (UK), Jochen Greiner (Germany), Manabu Ishida (Japan), Andrew King (UK), Mario Livio (USA), Edward Sion (USA), Paula Szkody (USA), Brian Warner (South Africa), Dayal Wickramansinghe (Australia) and Lev Yungelson (Russia)

And the Local Organizing Committee: Sergei Zharikov, Maite Rozas, Urania Ceseña and Raul Michel.

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G. Tovmassian & E. Sion
Editors of the proceedings