H. Rickman (ed.), Reports on Astronomy, Vol. XXVA, 265–267.

DIVISION V: VARIABLE STARS
(ETOILES VARIABLES)

Commission 27: Variable Stars
Commission 42: Close Binary Stars

1. Division V

Division V currently has about 850 members whose primary common interest is the variability of single and binary stars and its astrophysical ramifications. These include stellar pulsation and intrinsic instabilities, solar oscillations (helioseismology) and solar like variability, asteroseismology, eruptive stars (flare stars, novae, and supernovae), variability produced by rotation and magnetic activity (e.g., RS CVn, BY Dra stars and pulsars), and variability arising from dust clouds, circumstellar disks and ejecta (e.g., R CrB, T Tauri and some Be stars etc.). Light variations in close binaries arise from a variety of causes – such as eclipses, proximity effects (tidal distortions and irradiation) and also from the effects of gas streams and circumstellar disks.

Close binary stars include systems with non-degenerate members – such as the very numerous W UMa contact systems, semi-detached Algol-type systems, and *detached* binaries in which both stars are located inside of their respective Roche lobes. When eclipses occur, these systems can be used as *astrophysical laboratories* to investigate stellar and binary star evolution and also they provide the fundamental properties of stars that include masses, radii, luminosities, ages etc. Some detached eclipsing binaries are turning out to be important as *distance indicators.* Eclipsing binaries also can be used to "map" stellar surfaces, stellar atmospheres, and accretion disks. Close binaries containing at least one degenerate component – such as Cataclysmic Variables, Novae, Symbiotic Variables, Low and High Mass X-Ray binaries, and Type Ia Supernovae – are very important for understanding the physical properties of white dwarfs, neutron stars, and black holes as well as the energetic accretion processes that frequently occur in binaries with compact components. As is well known, SN Ia stars serve as bright *standard candles* for determining the distances of very distant galaxies.

Moreover, there are some close binaries that are of interest to both the variable star and close binary communities. In addition to symbiotic stars (which frequently contain pulsating Mira variables), a growing number of eclipsing binaries containing pulsating star components – Cepheids, RR Lyrae stars, β Cephei stars and δ Scuti variables – are being discovered. These systems are particularly important for studying and modeling pulsation mechanisms because the masses and radii of the pulsating components can be found from their light and radial velocity curves.

We live in a very exciting time for the study of variable and close binary stars. Over the last decade, concerted ground-based photometric programs have discovered tens of thousands of new variable stars in our Galaxy and in the Local Group. In the near future ground-based and orbiting telescopes will discover tens (or hundreds) of thousands more variable stars. With planned space missions such as Kepler, which can measure stellar brightness with a precision of better than 0.1 millimag, it may turn out that most of the stars in the sky will be variable stars. The variability of stars is not confined to the

optical wavelengths but includes gamma rays, X-rays, UV, IR, and radio wavelengths. Also, variations in the spectra and polarization of stars are important for understanding the physical nature of the stars. More recently (and into the near future), light variations from the eclipses and proximity effects of close exosolar planet-star binary systems are being vigorously investigated. More detailed discussions of recent developments in variable and close binary star research can be found in the reports from C27 and C42, which are included in this volume.

Additionally, Division V supports or sponsors three IAU Working Groups. More information can be found about their activities by contacting the working group chairs listed below. These working groups and contact persons are:

Working Group on Spectroscopic Data Archiving, Elizabeth Griffin <remg@astro.ox.ac.uk>,

Working Group on Active B Stars (with D IV), Stanislav Stefl <sstefl@sunstel.asu.cas.cz>,

Accretion Physics in Interacting Binaries (C42), Paula Szkody <szkody@alicar.astro.washington.edu>.

2. Recent Division V Activities

Currently, the Division V Board is composed of a total of 7 representatives from C27 and C42. The past and current Presidents of C27 and C42 serve and two additional board members are elected from each Commission and the board. During May 2002, the IAU Executive Committee met in St. Petersburg, Russia. This was first time the IAU Division Presidents were invited to participate in a non-General Assembly meeting. One of the major results of this meeting was the selection of IAU Symposia, Colloquia, and Joint Discussions to be held during 2003. All of the Joint Discussions and Symposia will take place during the IAU XXVth General Assembly that will be held in Sydney, Australia during 13-26 July, 2003. In particular, a very interesting and attractive program for the General Assembly has been approved. Importantly for Division V members (and others interested in stellar variability), a large number of these meetings and Joint Discussions have been organized, sponsored or endorsed by Division V. These meetings should be of great interest to many Division V members. A short list of the meetings (along with venues and organizers) that are supported or organized by Division V is given below.

3. Symposia & Colloquia Supported by Division V

Colloquium 191: *Environment and Evolution of Binary Stars*, February 03-07, 2003: Merida (Yucatan), Mexico. Contact Address: C.D. Scarfe, E-mail: scarfe@uvic.ca

Colloquium 193: *Variable Stars in the Local Group of Galaxies*, July 06-11, 2003, Christchurch, New Zealand. Contact Address: D.W. Kurtz, E-mail: dwkurtz@uclan.ac.uk

Colloquium 194: *Compact Binaries in the Galaxy and Beyond*, November 17-21, 2003, La Paz, Mexico. Contact Address: G. Tovmassian, E-mail: gag@sciences.sdsu.edu or gag@astrosen.unam.mx

4. Meetings supported or organized by Division V at the the XXVth General Assembly

Symposium 219: *Stars as Suns: Activity, Evolution, and Planets*, July 21-25, Contact Address: A.O. Benz, E-mail: benz@astro.phys.ethz.ch

Joint Discussion 05: *White Dwarfs: Galactic and Cosmological Probes*, July 16 & 17, Contact Address: H. Shipman, E-mail: harry@straus.udel.edu

Joint Discussion 09: *Astrotomography*, July 17, Contact Address: S. Isaacs, née Vrielmann, E-mail: stch307@hs.uni-hamburg.de

Joint Discussion 12: *Solar-like Oscillations: Insights and Challenges for the Sun and Stars*, July 18 & 19, T.R.Bedding, E-mail: bedding@physics.usyd.edu.au

Joint Discussion 14: *Extragalactic Binaries*, July 18 & 19, Contact Address: I. Ribas, E-mail: iribas@am.ub.es

Joint Discussion 20: *Frontiers of High Resolution Spectroscopy*, July 23, Contact: J.L. Linsky, E-mail: jlinsky@jila.colorado.edu

5. Plans for the General Assembly

Division V will request time during the General Assembly for a business meeting and two science sessions. These sessions are being organized to bring the members of C42 and C27 together (all interested IAU members are invited to attend) to discuss recent results and developments in the study of variable stars and close binary systems. For information and suggestions please contact me at <edward.guinan@villanova.edu>. In addition to the meetings listed above, there are a number of other very interesting Symposia, Joint Discussions, and Special Sessions scheduled in Sydney that will be worth attending. We hope that you can come to Sydney and attend the XXVth General Assembly, meet old friends and make new ones, and enjoy all of the exciting talks, discussions, and activities that are being planned.

Edward F. Guinan
President of the Division

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