

### **Developing an Astronomical Observatory in Paraguay**

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Background: Paraguay has some heritage from the astronomy of the Guarani Indians. Buenaventura Suarez S.J. was a pioneer astronomer in the country in the XVIII century. He built various astronomical instruments and imported others from England. He observed eclipses of Jupiter's satellites and of the Sun and Moon. He published his data in a book and through letters. The Japanese O.D.A. has collaborated in obtaining equipment and advised their government to assist Paraguay in building an astronomical observatory, constructing a moving-roof observatory and training astronomers as observatory operators. Future: An astronomical center is on the horizon and some possible fields of research are being considered. Goal: To improve education at all possible levels by not only observing sky wonders, but also showing how instruments work and teaching about data and image processing, saving data and building a data base. Students must learn how a modern scientist works.

### **Science with Small Observatory Instruments**

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Good science can be done with small instruments. Very productive research in the area of short period interacting binary systems has been conducted by the authors with PMT's and small CCD cameras attached to 0.28 m to 0.9-m instruments. A summary of important results over the past fourteen years is presented along with current work on the interesting semidetached and contact solar type systems TY UMa, V523 Cas, CN And, VZ Psc and BE Cep. Light curve asymmetries in CN And, BE Cep and possibly others indicate the presence of gas streams. This may signal that they are undergoing evolution into contact, an important but rarely observed stage in binary star evolution. Period studies are presented for each of the systems, documenting interesting orbital histories. V523 Cas and TY UMa display large period changes giving evidence of a light time effect due to a third body. This research has been largely supported at the local level and by small research grants from the American Astronomical Society.

NWG acknowledges participation in the Research Experiences for Undergraduates (REU) program at the Southeastern Association for Research in Astronomy (SARA), sponsored by the National Science Foundation (NSF grant AST9619939). (Co-authors are: M.L. Stoddard, W. van Hamme and N.W. Gothard, D.R. Faulkner and R.L. Walker, all of the U.S.A.)