Contributions by Citizen Scientists to Astronomy *(Abstract)*

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Abstract The AAVSO's experience in utilizing the skills, equipment, and enthusiasm of amateur astronomers towards its research is not unique in astronomy. Citizen Scientists have contributed to our understanding of asteroids, exo-planets, solar system weather, light echoes, and galactic streaming, as well as inventing new equipment and software. This talk will highlight some of the recent advances by Citizen Scientists, and suggest some areas where they can contribute in the future.

Lessons Learned During the Recent ε Aurigae Eclipse Observing Campaign *(Abstract)*

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Abstract The eighteen-month-long eclipse of the third-magnitude star, ε Aurigae, is forecast to end during May 2011, based on six eclipse events, in 2010, 1982, 1955, 1930, 1902, and 1874. In partnership with AAVSO, Hopkins Phoenix Observatory, and others, we have organized observing campaigns during the past several years in order to maximize data acquired during this rare event and to promote reporting and analysis of observations of all kinds. Hundreds of registered participants have signed up for alert notices and newsletters, and many dozens of observers have contributed photometry, spectra, and ideas to the ongoing effort—see websites: www.CitizenSky.org and www.hposoft.com/Campaign09.html. In this presentation, I will provide an update on the participation leading to extensive photometric results. Similarly, bright star spectroscopy has greatly benefited from small telescope plus spectrometer capabilities, now widely available, that complement traditional but less-frequent large telescope high dispersion work. Polarimetry provided key insights during the last eclipse, and we promoted the need for new data using this method. Finally, interferometry has come of age since the last eclipse, leading to the direct detection of the transiting dark disk causing the eclipse. Along with these traditional measurements, I will outline campaign-related efforts to promote Citizen Science opportunities among the public. Support for

these efforts derives in part from AAVSO/NSF-Informal Science Education, NSF AAG grant 10-16678, and a bequest to the University of Denver Astronomy Program by alumnus William Herschel Womble, for which I am grateful.

Ed. note: a more complete version of this paper will appear in the forthcoming epsilon Aurigae special issue, part of JAAVSO *Vol. 40, No. 2.*

Cataclysmic Variables in the Backyard *(Abstract)*

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Abstract The last decade has seen plummeting prices and significant advances in CCD-camera and smart-telescope technology, reaching all the way to the humblest of telescopes. There are now thousands of well-equipped amateur astronomers interested in using their telescopes for research, and many hundreds already doing so in coordinated campaigns. Variable star science has benefited tremendously. Since it's always dark and always clear somewhere, coordinated photometry can accumulate nearly 24-hour coverage—and since the observers own their telescopes, very long campaigns are feasible, with little worry about weather. I'll describe one network of observers, the Center for Backyard Astrophysics (CBA). The telescope apertures are 20–50 cm, enabling good signal-to-noise and time resolution down to V=18. We organize campaigns of time-series photometry of cataclysmic variables (novae, dwarf novae, magnetic variables, some X-ray binaries)—and routinely achieve thousand-hour campaigns with no significant aliasing, since the telescopes are distributed around the world. This enables sensitive searches for periodic signals, extending even to long time scales (months). We now produce most of the world's supply of accretion-disk precession periods, and keep close watch on all the other clocks in cataclysmic variables (orbit, white-dwarf rotation and pulsation, and quasiperiodic oscillations).

Planet Hunting With HATNet and HATSouth *(Abstract)*

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Abstract Transiting exoplanets (TEPs), especially those found around bright stars, are particularly important as they provide unique opportunities to study the physical properties of planetary mass objects. The Hungarian-made Automated Telescope Network (HATNet) project—one of the small telescope surveys—has been extremely successful in the field of TEPs, contributing twenty-seven published discoveries, and one independent discovery of a previously published planet. Publications on several additional planetary systems are in preparation. I will discuss how HATNet operates around the globe, and how these fully automated small (11cm diameter) telescopes produce big science. I will also mention the related HATSouth project, now in full operation, and monitoring selected southern fields round-the-clock. Finally, I will conclude on how small and big telescopes collaborate in exoplanet science.

The Z CamPaign Early Results *(Abstract)*

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Abstract The Z CamPaign is an observing project designed to acquire enough detailed, long-term data to unambiguously classify dwarf novae as bona fide members of the Z Cam sub-type or not. Because the defining characteristic of all Z Cam dwarf novae are "standstills," a temporary period of relative quiet between maximum and minimum light, we are monitoring these systems for this specific activity. Amateur astronomers are gathering all the data with backyard telescopes as part of an AAVSO Cataclysmic Variable Section observing initiative. We will discuss the organization, science goals, and present early results of the Z CamPaign.

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