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of the Society for Astronomical Sciences**



Symposium on Telescope Science

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Galileo's Legacy

Small Telescope Science—1609 and 2009

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* International conference 31 December 2008 – 5 January 2009
See www.GalileosLegacy.org for conference details

* Conference will be held at the Makaha Resort, Waianae, Oahu, Hawaii
See www.MakahaResort.net for resort details

Special Focus Sessions

Galileo and his telescopes and discoveries
SCTs and other commercial telescopes
Design and construction of small telescopes
Telescope control systems
Remotely accessed/robotic observatories
CCD cameras today
Spectrographs and aperture photometers
Surveys producing new objects to study
Data mining for amateurs and students
Undergraduate (and high school) astronomical research
Pro-am cooperation in astronomy
Intrinsically variable stars
Eclipsing binaries
Cataclysmic variables
Supernova searches
Asteroid astrometry
Asteroid photometry
Planetary transits
Microlensing

Tutorial sessions

Introduction to CCD cameras
Photometry essentials
Intrinsically variable stars
Eclipsing binary primer

Galileo's Legacy

Today's small telescope science is Galileo's Legacy. Not able to purchase a telescope or even a how-to book, Galileo designed and built his own 1.5-inch aperture telescope, thereby launching the honorable tradition of do-it-yourself telescope-making. In 1609, Galileo turned his newly-made telescope toward the heavens and, in rapid succession, discovered

the mountains on the Moon, a multitude of previously invisible stars, and four moons orbiting Jupiter. Not wishing to be scooped, Galileo wasted no time in describing his discoveries in *Sidereus Nuncius*. Many of Galileo's observations were made from his backyard—his only observatory while under house arrest.

Four centuries after Galileo's 1609 observations—thanks to the revolutionary trio of affordable CCD cameras, small go-to Schmidt-Cassegrain and home-brew telescopes, and personal computers—thousands of backyard Galileos around the planet are now probing cosmic mysteries every clear night. They conduct scientific research across a broad spectrum: tumbling asteroids, pulsating stars, eclipsing binaries, transiting planets, and sputtering matter as it spirals onto white dwarfs and neutron stars.

To commemorate Galileo and celebrate his legacy, 2009 has been designated the International Year of Astronomy (IYA). As midnight on New Year's Eve approaches, fireworks will light up the night sky at the Makaha Resort in Hawaii, launching the IYA with a five-day celebratory conference that will not only honor Galileo and his telescope, but also the many current builders and researchers—amateurs, students, and professionals—who are successfully using small telescopes, CCD cameras, and even spectrographs to advance astronomical science.

How do small telescopes in 2009 compare with Galileo's 1609 telescope? Today's backyard and campus telescopes have apertures around 15 inches (and beyond). With, typically, 10 times the aperture of Galileo's telescope, they have 100 times the light gathering power. Equipped with CCD cameras, they can accumulate photons for an hour, compared with $1/10^{\text{th}}$ of a second (or less) for Galileo's eye—some 36,000 times longer. Considering both photon gathering area and integration time, today's small telescopes and CCD cameras can accumulate an amazing 3,600,000 times more photons than Galileo's telescope and eye—not to mention the advantages inherent in today's greater resolution, computerized go-to, and image processing capabilities. No wonder these small telescopes with their CCD "eyes" are such powerful scientific research tools!

We invite you to join an eclectic gathering of amateur, student, and professional small-telescope researchers—not to mention home builders and commercial manufacturers—as, together, we celebrate Galileo's telescope and discoveries and, four centuries later, Galileo's legacy: the remarkable resurgence of small telescope science.