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THE SHOEMAKER NEO GRANT PROGRAM: MAKING A DIFFERENCE

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Background

For more than 17 years, The Planetary Society's Gene Shoemaker NEO Grant program has been a resource for amateur observers, observers in developing countries, and under-funded professional observers in contributing to vital NEO research, and grant winners have made significant contributions to asteroid discovery, tracking, and characterization. The program honors pioneering planetary geologist Gene Shoemaker, who did so much to help us understand the process of impact cratering on the planets and the nature of the NEO population.

History and Current Foci of the Program

The Planetary Society has awarded 49 Shoemaker NEO grants (to 39 awardees) totaling about $323,000 to observers from 16 different countries on 5 continents.

Originally, the focus of the program was on discovery, but in an era of professional surveys, the foci have shifted toward astrometric follow-up and to valuable physical studies that help better characterize the physical nature of NEOs, including phase curves and the determination of binary systems. Many of the most productive observatories focused on astrometric follow-up and characterization utilize hardware obtained through the Shoemaker NEO Grant program.

Grants typically go to hardware upgrades to take already productive observatories to the next level, for example through sensitive cameras or equipment to robotically control an observatory. Previous grants have also been used for activities such as re-aluminizing mirrors, or paying for other components of existing or newly developed telescopes.

The worldwide distribution of the past winners also has allowed collaboration on discoveries and follow-up with groups in one country contacting groups in other countries to provide rapid follow-up of discoveries.

Distribution of Shoemaker NEO Grant Winners over the Program's History

The program gives priority to aiding observers with telescopes with apertures larger than about 24 inches, or 60 centimeters, or effectively larger telescopes at superior observing sites. The program also aids those seeking to automate observing facilities and equipment. Large telescopes at sites with dark, clear skies allow for observation of NEOs fainter than magnitude V = 20.5-21 (where the professional surveys are discovering many new small objects) and automation of observing facilities allows observers with 'day jobs' to utilize their facilities more nearly full time and much more efficiently. Priority is also given to programs that can leverage Shoemaker grant funds through matching contributions from other sources.


Italian 2013 Shoemaker NEO Grant winner Albino Carbognani with the 0.81m telescope at the Astronomical Observatory of the Autonomous Region of the Aosta Valley (OAVdA)

Shoemaker NEO Grant Winners 2015

The program currently follows a 2 year proposal cycle. Winners of 2015 Shoemaker NEO Grants were announced at the 2015 IAA Planetary Defense Conference public event. There were 19 proposals. $53,250 was awarded to 6 winners as follows:

Luca Buzzi, operates the G. V. Schiaparelli observatory near Varese in northern Italy. This system is one of the most productive NEO astrometric (sky position) follow-up facilities in the world. They have recently procured a large 0.84-meter diameter f/4 telescope. His grant of $9,995 will enable the purchase of a CCD camera for this telescope. With this equipment in place, it is expected that Luca will be able to observe NEOs down to a visible magnitude (brightness) of V~ 22, on par with professional facilities around the world.

Maurice Clark, is given a grant of $8,000 to assist with moving a telescope from Texas, USA to the town of Koorda in Western Australia, and to assist with observatory construction. This is an extraordinarily good observing site that will enable observations of dimmer objects and also provide good geographic latitude and longitude coverage for lightcurve (brightness versus time) research, important for determining spin rate and other asteroid information. From this location, Dr. Clark will continue his successful work determining asteroid rotation periods, and surely add to his 18 published papers in the Minor Planet Bulletin.

Daniel Coley, specializes in determining rotation periods for NEOs, Hungarias, and Jupiter Trojan minor planets. His grant of $8,065 will purchase a new CCD camera to replace a failing instrument at his observing facility in at the Center for Solar System Studies (CS3) in Landers, California. This new CCD will allow Daniel to concentrate on year-round observing of NEOs, and publishing the results in the Minor Planet Bulletin and providing raw lightcurve (brightness versus time) data to the database hosted at the Minor Planet Center (MPC).

Robert Holmes at the Astronomical Research Institute (ARI) in Westfield, Illinois, is among the most prolific follow-up observers of NEOs in the world. His facility in northern Illinois operates several telescopes year-round. Robert recently completed construction of a 1.3 meter diameter telescope. He will be granted $5,500 for a new more sensitive CCD for this telescope (the CCD currently on that telescope will be moved to a 0.6 meter telescope). The addition of the new camera on the 1.3m telescope will allow Robert to continue his efficient and productive NEO follow-up program, and provide even fainter follow-up on NEOs fainter than visible magnitude (brightness) of V = 22.

Julian Oey, is the director of Blue Mountains Observatory in New South Wales in Australia. The facility specializes in lightcurve observations as well as astrometry for NEOs and comets. The facility houses no less than five telescopes, observing dozens of NEOs per year photometrically (brightness measurements) and over 200 NEOs per year astrometrically (position measurements). His grant of $15,000 will allow to Julian to obtain a CCD for the largest telescope (24 inches diameter) in the observatory. This camera and telescope combination will provide essential follow-up observations of NEOs from southern skies to magnitudes (brightnesses) fainter than V = 21, as well as determine lightcurves for NEOs at much fainter magnitudes than before.

Donald Pray, specializes in determining lightcurves for binary asteroids. His research, conducted from Sugarloaf Mountain Observatory in Massachusetts, USA also concentrates on determining physical parameters such as orbital period and pole position for these objects. Donald will be granted $6,690 to purchase a new CCD camera to replace an old and failing camera; this will allow research to continue uninterrupted and more efficiently than it is currently being done.

More information on the Shoemaker NEO grants and grant winners can be found at: http://planetary.org/neogrants

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