Amateur astronomers in support of observing campaigns

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The Pro-Am Collaborative Astronomy (PACA) project evolved from the observational campaign of C/2012 S1 or C/ISON. The success of the paradigm shift in scientific research is now implemented in other comet observing campaigns. While PACA identifies a consistent collaborative approach to pro-am collaborations, given the volume of data generated for each campaign, new ways of rapid data analysis, mining access, and storage are needed. Several interesting results emerged from the synergistic inclusion of both social media and amateur astronomers:

1. the establishment of a network of astronomers and related professionals that can be galvanized into action on short notice to support observing campaigns;
2. assist in various science investigations pertinent to the campaign;
3. provide an alert-sounding mechanism should the need arise;
4. immediate outreach and dissemination of results via our media/blogger members;
5. provide a forum for discussions between the imagers and modelers to help strategize the observing campaign for maximum benefit.

In 2014, two new comet observing campaigns involving pro-am collaborations have been identified: (1) C/2013 A1 (C/Siding Spring) and (2) 67P/Churyumov-Gerasimenko (CG). The evolving need for individual customized observing campaigns has been incorporated into the evolution of PACA (Pro-Am Collaborative Astronomy) portal that currently is focused on comets: from supporting observing campaigns for current comets, legacy data, historical comets; interconnected with social media and a set of shareable documents addressing observational strategies; consistent standards for data; data access, use, and storage, to align with the needs of professional observers. The integration of science, observations by professional and amateur astronomers, and various social media provides a dynamic and evolving collaborative partnership between professional and amateur astronomers. The recent observation of comet 67P, at a magnitude of 21.2, from Siding Spring, Australia, via robotic telescope ! network, also detected several asteroids in a crowded star field (SSI, Press Release, May 2014). These may be useful in support of the ESA/Gaia mission, which will characterize asteroids and comets to a magnitude of 20. While its network of amateur astronomers has already been established (Thuillot, 2005, ESASP, 576), such observations by robotic telescope networks can provide both astrometry and subsequent science analysis of the data acquired. An additional benefit of amateur network will be to unequivocally recognize asteroids and comets via complementary imaging that is not possible for the mission itself.