

A Radio Astronomical Star Party for those “On The Verge”

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Summary

Here we describe the Onsala Stjärnträff (Onsala Star Party), an unconventional outreach event that was held during Sweden’s inaugural Day and Night of Astronomy in October 2012. The target group consisted of individuals who are “on the verge” of discovering astronomy; individuals who have a spark of enthusiasm for astronomy, but who have not yet taken this passive interest to the next level. For the event, we adapted the concept of a star party to provide insight, inspiration, hands-on experience and networking opportunities for the participants. Furthermore, the Onsala Space Observatory’s radio telescopes allowed us to compensate for poor weather and to fulfil our role in communicating radio astronomy to a wider public.

Introduction

Groups of visitors are welcomed several times a week to the Onsala Space Observatory, the Swedish national facility for radio astronomy. Typically, they consist of school classes, organisations for the retired and workplace outings. A couple of times a year we are open to the general public on a weekend day, mostly attracting families from the local area.

During a typical two-hour tour, visitors are given a presentation about astronomy and the facility and then guided to see the two large radio telescopes and the exhibition area. The purpose of the guided tours is threefold: to show that the work done at the observatory is not secretive, to encourage interest in science and research, and to provide a forum for the public to ask questions.

On 13 October 2012, the Swedish Day and Night of Astronomy (or Astronomins Dag och Natt (ADON) in Swedish), was celebrated for

the first time, with astronomy events taking place all over the country. The initiative for ADON came from the Swedish Astronomical Society (Svenska Astronomiska Sällskapet). It was intended to build on the enthusiasm for astronomy outreach and the wide range of events organised at many astronomical institutions and amateur organisations during the International Year of Astronomy 2009. If the first ADON was a success, then it would become an annual event. As one of the largest Swedish astronomical institutions, Onsala Space Observatory was keen to participate¹ in the event.

The idea

ADON gave us an opportunity to do something special for a small group of enthusiasts. We decided to try to attract a group of individuals who are enthusiastic about space and astronomy, but who have not yet found a way to develop their interest. Our vision was to create an event to feed

and nurture the enthusiasm of such individuals and inspire them to develop their passive interest and take it to the next level by joining, for example, an astronomy class or amateur astronomy society, or purchasing a telescope. Furthermore, it was a priority for the event to reach underrepresented sections of the astronomy community (women, young adults and minorities).

A star party was chosen as the format for the event. Star parties are traditionally focussed on optical night-time observations, but combined optical and radio star parties are not unheard of: the Green Bank Star Quest, for example, has been arranged in collaboration between amateur astronomer organisations and the National Radio Astronomy Observatory (NRAO) at the Robert C. Byrd Green Bank Telescope (GBT) in West Virginia every year since 2004². While these multiple-day events for hundreds of people mainly attract amateur astronomers, the vision for the Onsala Star Party was to reach a more diverse group of people.

The planned format of the Onsala Stjärnträff:

- Hands-on observations using the large radio telescopes, the smaller student radio antennas, SALSA (Such A Lovely Small Antenna), and optical telescopes would be offered.
- To promote the social aspect of a classic star party, participants would spend the night at the Observatory and observe throughout the night (weather permitting). The number of beds at the Observatory limits the number of participants to 15. A minimum age of 16 years was set for participants, and parental consent was required for participants younger than 18.
- To invite two external guest speakers from outside the research community who have expertise in astronomy, such as astrophotographers and science writers.
- To invite one of our local scientists to present astronomical research in an accessible way.
- The event would be free of charge and funded by the Observatory's budget for outreach. Participants would pay their own transport costs.
- Direct interaction between participants and professional astronomers would be a vital component of the Onsala Stjärnträff.

Finding participants

The slogan for marketing the event was chosen in an attempt to appeal to a wider audience than the usual star-party goers: "Are you fascinated by the Universe?" Furthermore, the language in the advertising was carefully chosen so that it was clear that no prior knowledge of astronomy was needed to participate; all that was required was an interest in, curiosity and enthusiasm for astronomy.

Reaching out to the public at large on a limited marketing budget was challenging. To keep costs down, the event was marketed online, on the Observatory's home page³, on social media accounts (Facebook and Twitter) and by direct email to contacts in the science media, academia, the amateur astronomy community, and high school teachers. The email actively encouraged recipients to spread the word about the event to friends, relatives, colleagues and students. These efforts led to

a few items in astronomy blogs, a blog entry at Chalmers University of Technology in Gothenburg, but there was no pick-up by the mainstream media.

Selecting participants

People who were interested in participating were asked to complete an online registration form, which asked about their age, gender and education, as well as some open-ended questions, such as "Introduce yourself in a couple of sentences!" and "Why do you want to participate in the Onsala Stjärnträff?".

By the application deadline more than 50 people had applied for the 15 available positions. However, six applications did not match the terms and conditions attached to the application and were disregarded. Of the 44 valid applications, 15 were submitted by women and 29 by men, with ages ranging from 16 to 73 years old. All applications were read by three astronomers at the Observatory and rated independently based on the perceived level of enthusiasm.

Figure 1 shows a comparison between the age profile and gender ratio of the applicants and the participants. This information was used in combination with the answers to the application questions to select participants in accordance with the goal of reaching underrepresented groups within the astronomy community: women and young adults.

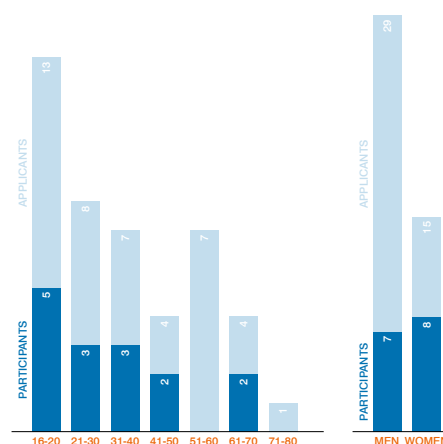


Figure 1. Age and gender distribution of the Onsala Stjärnträff's applicants and participants. Credit: Robert Cumming

The event

The Onsala Stjärnträff took place from 13:00 on Saturday, 13 October 2012, until 10:00 the following day. The schedule was built around three presentations and activities at four observational instruments. However, since the purpose of the event was to engage the participants, there was flexibility in the schedule to allow for discussions.

Astronomer and author Marie Rådbo⁴ kicked off the programme with a presentation about her work in communicating science and astronomy to the general public, followed by a question and answer session. Dr Carina Persson, the local radio astronomy expert, talked about scientific methods used in astronomy research in her presentation, "Spies in Space". Questions from the participants directed the focus of the talk towards what is known about the Universe in general, evolving into a group discussion that included the previous speaker.

Participants were then given a taste for the beauty of the night sky with a presentation by astrophotographer P.-M. Hedén⁵. Tips about lenses, camera settings and software were offered, as well as examples of photos and a stunning time-lapse movie that he had put together of his favourite astrophotography sessions.

Hands-on observations

The Onsala 20-metre radio telescope was not being used that evening for research, so it was made available for use by the star-party participants. Participants were introduced to the concept of spectral line radio observations by Dr. Henrik Olofsson. For short demonstrations, each group observed water masers in Galactic massive star-forming regions. A longer observing project, which stretched over the entire star party, involved water megamasers near the centre of the galaxy NGC 4258.

Unfortunately the skies were covered by cloud throughout the star party, so the evening optical observing session was cancelled. In case of poor observing conditions, an alternative activity had been prepared. For this, Dr Peter Forkman introduced participants to the free open source planetarium software Stellarium⁶. In parallel to this activity, a few participants were introduced to SALSA⁷.

This pair of 2.3-metre radio telescopes was specifically built at Onsala Space Observatory to introduce students and teachers to radio astronomy by observing galactic HI 21-centimetre emission.

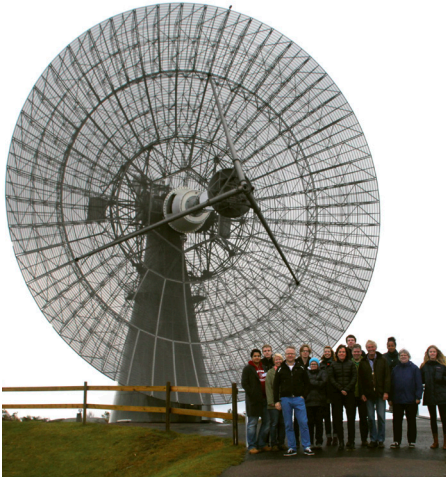


Figure 2. The 15 participants and coordinator Eva Wirström (third from left) in front of the 25-metre radio telescope at Onsala Space Observatory, enjoying one of the few rain-free moments during the star party. Credit: Klara Rättegård and James Dresch

Evaluation

Before concluding the star party in the morning, participants were asked to complete a questionnaire about their opinion of the event. The questionnaire included a number of statements regarding the expectations and outcomes for the star party, which participants were asked to mark as "I completely agree", "I partly agree" or "I don't agree". The three presentations were evaluated by choosing one or several descriptive words from a list. Furthermore, the time spent on each segment during the event was rated as "Too short", "About right" or "Too long". Finally, three open-ended questions were posed to participants: "The best things about Onsala Stjärnträff were:", "The worst things about Onsala Stjärnträff were:", and "The following changes would have improved Onsala Stjärnträff:".

Expectations and outcomes

All 15 participants completed the questionnaire. Fourteen participants "completely agreed" that they expected to get to know other space enthusiasts, learn more about astronomy research and discuss space with

experts. In addition, about two thirds of the participants "agreed completely" that they expected to learn more about the nature of the Universe, radio astronomy, observing the night sky and what it is like to be a professional astronomer.

The expectation that the participants would learn more about radio astronomy was the one that was best fulfilled: 13 participants "agreed completely" that this had been achieved, and none disagreed. Furthermore, all of the participants either "completely agreed" or "partly agreed" that they had connected with other space enthusiasts.

Other statements that at least two thirds of the participants agreed with: that they wanted to read more about space; that they planned to photograph the night sky (more often); that they planned to buy a telescope or make more frequent use of one that they already own; and that they intended to tell others about astronomy more often.

However, less than one third completely agreed that they knew more about the nature of the Universe following the star party, that they planned to join an astronomy club, or that they now planned to take astronomy classes.

Overall, the participants found the available time adequately divided between activities, but that more time should have been set aside for free discussion and questions to the experts. Three respondents wished for more time at the 20-metre telescope, to be able to get a better understanding of how it works and to learn how to operate it. Also, several concluding comments conveyed an interest in finding out more about current research at the Observatory. Naturally, the questionnaire reflected disappointment over the cancelled optical observations.

Conclusion

The unsophisticated marketing strategy could be improved in order to reach a representative group of astronomy enthusiasts. For example, the fact that all the advertisements and the application form were web-based may have excluded a significant group of potential applicants.

Feedback from the questionnaire shows that the goals of connecting a diverse group of space enthusiasts, to inspire them to

take their interest to the next level, and to promote radio astronomy, were all achieved. Furthermore, many of the participants expressed an intent to "tell others about astronomy more often" (11 people "completely agreed" with this statement), showing that the impact of the star party will reach beyond the 15 selected participants.

Weighing up the amount of work put into planning and arranging the event against the positive outcomes, we plan to organise the Onsala Stjärnträff again this year for the second ADON, which will be held on 28 September. For the next event, the questionnaire points out several things that could be improved. For example, dedicating more time to describing current research projects at the Observatory and trying to involve more local astronomers in the event in order to facilitate small group discussions.

Notes

- ¹ Also for ADON we organised another unusual outreach event, Astronomy Slam, in Gothenburg (see note 3).
- ² <http://www.greenbankstarquest.org>
- ³ <http://www.chalmers.se/rss/oso-sv/popularvetenskap/adon>
- ⁴ <http://marie.radbo.org/>
- ⁵ <http://klarhimmel.blogspot.se/>
- ⁶ <http://www.stellarium.org/>
- ⁷ <http://brage.oso.chalmers.se/salsa/>

Biographies

Eva Wirström is a Swedish astronomer interested in how interstellar chemistry influences the conditions of star and planet formation. She recently returned to Chalmers University of Technology, Onsala Space Observatory, after two years as a research associate at the NASA Goddard Center for Astrobiology. In her current position at Chalmers, she organises outreach activities at Onsala Space Observatory in parallel to her academic research.

Robert Cumming is the Communications Officer at the Onsala Space Observatory. He is also editor of the Swedish magazine *Populär Astronomi* and Sweden's representative in ESO's Science Outreach Network. He has written scientific papers on the kinematics of extreme star-forming galaxies and supernovae and their circumstellar environments.