

NEWSLETTER
Vol. N° 1
March 2026

Stellar Observations Network Group



This is the 2nd newsletter sent to the SONG community to inform on the project status, development and results. The aim is to send out a SONG newsletter a few times per year.

We had first light at the SONG node at the Apache Point Observatory. Big congrats to the US team on the development of the fourth SONG node.



1. General information and news

1.1. New SONG policies

The policies for being part of the SONG community have been updated and the new policies can be found here: soda.phys.au.dk/info/policies.php

Please be sure to read the new policies.

Additionally, the Executive Board of Directors has decided on a minor adjustment to the working group (WG) structure of SONG. Rather than having WG leads compile prioritised target lists for the Science Coordinators (SCs) to consolidate, the SCs will henceforth take the lead in setting target priorities, consulting WG leads for input and clarification as needed. WG leads are of course encouraged to continue engaging actively with their members to identify projects and targets of common interest, and to channel this input to the SCs. The process for proposing new projects remains unchanged, and the information on how to submit proposals to the SCs is specified on SODA.

1.2. First light at the Apache Point SONG node

The fourth SONG node is in development at the Apache Point Observatory and the team announced first light in autumn last year.

1.3. SONG workshop 2026 – SAVE THE DATES.

The bi-yearly SONG science workshop will be held as an add-on to the asteroseismic KASC/TASC workshop in Aarhus, Denmark 3rd to 10th of July 2026. We plan to use the 3rd for dedicated SONG activities and the 4th for informal get-together. We have a 3 hour splinter session dedicated on the 9th of July during the KASC/TASC workshop for SONG talks.

We would like to know if you would like to attend, so please fill out this poll before 13th of March: <https://poll-maker.com/poll5718982x07234Aff-167>

1.4. SONG granted funding by the Carlsberg Foundation

SONG has been granted €68.000 to upgrade the installation at some of the nodes. The funding covers purchase of new equipment such as guide cameras, new detector, weather station units etc.



2. Node's Reports

2.1. Aarhus University – AU (central node)

The central SONG node consists of the operational setup for distributing the observational programs to the nodes and data access for the community. The data storage and access are still in the process of migrating from an old system to a more robust setup. The operational part of the node are also planned to be moved to a new system which will most likely happen in 2026 but should have minimal or no effect on the operations of the SONG network.

2.2. Teide Observatory – OT

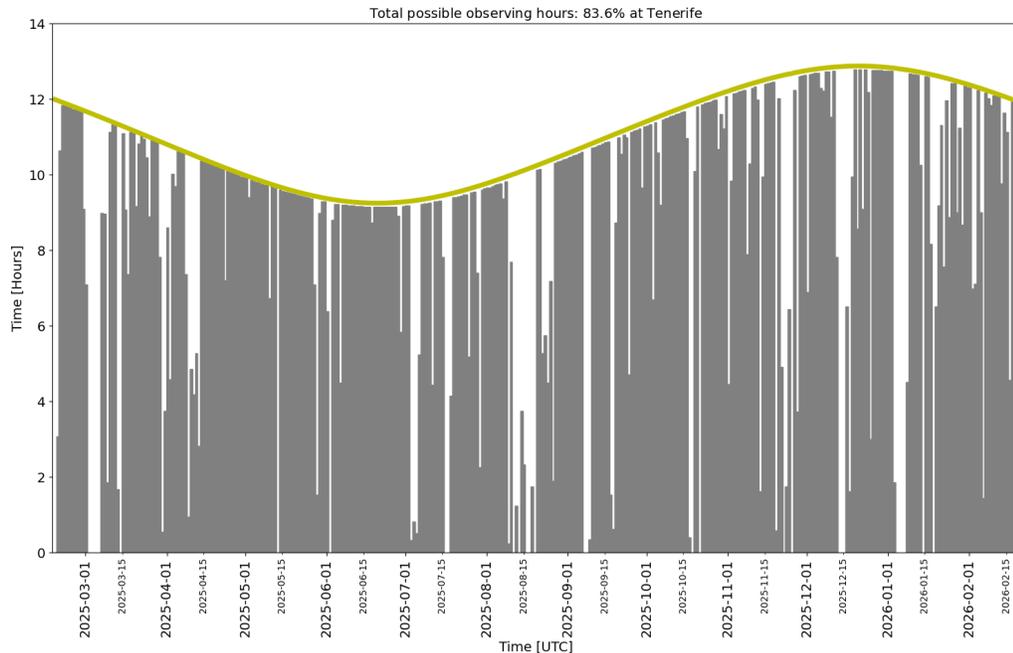
A few minor issues have influenced the observational program at OT. The motor slide bearings for bringing calibration light into the spectrograph broke. The local team including Pere Pallé, Antonio Pimienta and Héctor Quintero Arocha did the replacement and restored the operational status of the node to resume observations.

The spectrograph slit motor has had some issues during an extended period of time and it was decided to fixate it to position 8 (R ~ 120.000).

On the 17th of June 2025 the dome azimuth reference sensor got stuck and had to be manually loosened which was handled by Antonio.

A reoccurring issue with the telescope control software reporting an error with the hexapod system is present. Astelco is helping us to address this issue. A workaround for now is to keep the telescope powered on all the time.

The weather station units (WXT520 and Boltwood II) show signs of age and new units have been ordered and paid for by the new Carlsberg grant.



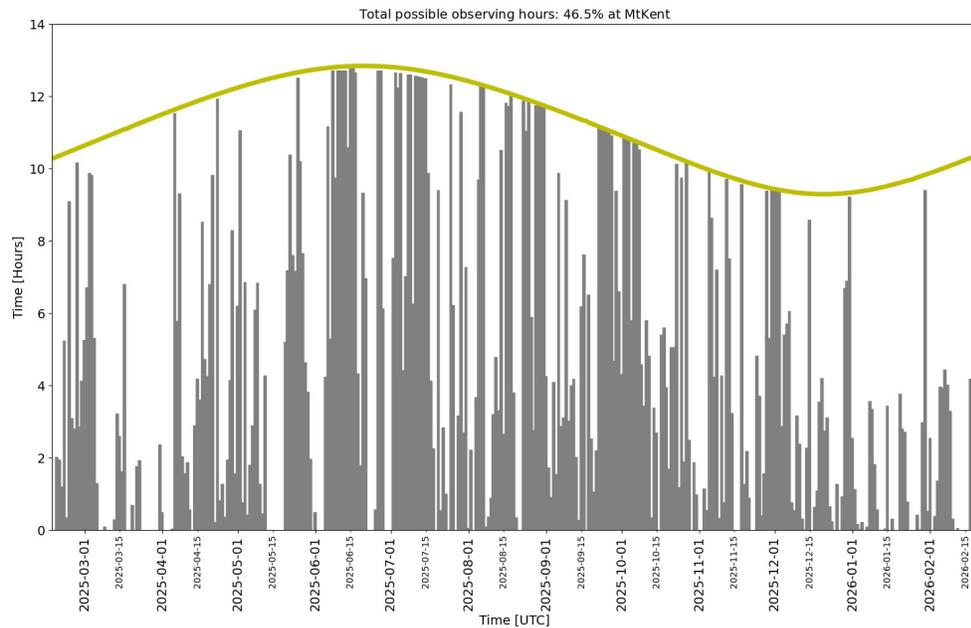
Weather statistics for the last year at OT in Tenerife. Gray shows the daily possible observing hours. The yellow line is the length of each night.

2.3. Mt. Kent Observatory - MKO

The second (old) 70cm CDK700 telescope at MKO has issues in the power system and was out of operation in autumn 2025. A proper cleaning of the encoder ring performed by Duncan Wright solved the issue and it is now back in operation.

In September 2025 a drop in flux was noticed and turned out to be an issue with the positioning of the iodine cell that was not centered correctly in the beam. This was fixed and the flux level returned to normal.

There have been some minor issues with the QHY detector at MKO and the Carlsberg grant covers a replacement unit. The grant also covers a new guide camera for T2 which is not performing perfectly.



Weather statistics for the last year at MKO, Australia. Gray shows the possible daily observing hours. The yellow line is the length of each night.

2.4. Lenghu Observatory - LO

A new server system will be set up at LO. The new setup will be more robust and flexible and rely on a cloud-based environment (OpenNebula) with virtual machines. It will be a prototype setup intended to be implemented in a similar way at all nodes if the performance is as expected.

The infrastructure of the nearby Tintin telescope has finished, so a proper cleaning of the main mirror of SONG will be performed soon.

2.5. Apache Point Observatory - APO

The APO node has been fully set up at the observatory and is currently undergoing commissioning which so far looks good. There are still some optimization required for the node to perform in an optimal way, but it is ready to take part in the coordinated network observations.

The first observations selected by the automated Conductor package in Aarhus was executed end January 2026.



*First light spectrum from the APO SONG node.
The target is the well-known μ Herculis*



3. Observational programs in SONG

The SONG network has conducted an extensive observing campaign on the O-type star λ Ori A (Meissa), from November 2025 until mid-February 2026, complementing observations taken in 2024. Observations have primarily been taken from the OT and MKO sites, but several weeks of successful test observations have also been acquired from the APO node. The analysis of the variability of λ Ori based on SONG data will be carried out by Alejandro Cabellero Almagro and Sergio Simon-Diaz.

At the MKO node high-cadence observations have in late 2025 focused on β Hyi, and we have in start Feb. 2026 switched to observations of α Cen – these observations are expected to continue until mid-2026 and are overlapping with contemporaneous observations by TESS.

At the OT node we have now switched to high-cadence observations of τ UMa, augmenting the observations made of this seismic subgiant in 2024. Together with τ UMa, we will in late Feb. start test-observations on λ Ser. Depending on the quality of these observations, we might continue to follow this star until fall 2026, together with observations of β Aql and/or μ Her. We expect a larger campaign on λ Ser in 2027, including also the APO node and one month of observations overlapping with TESS.

A small campaign (June-August of 2025) of OT observations was also dedicated to the binary system Spica – these observations will be combined with interferometric constraints from the MAGIC collaboration.

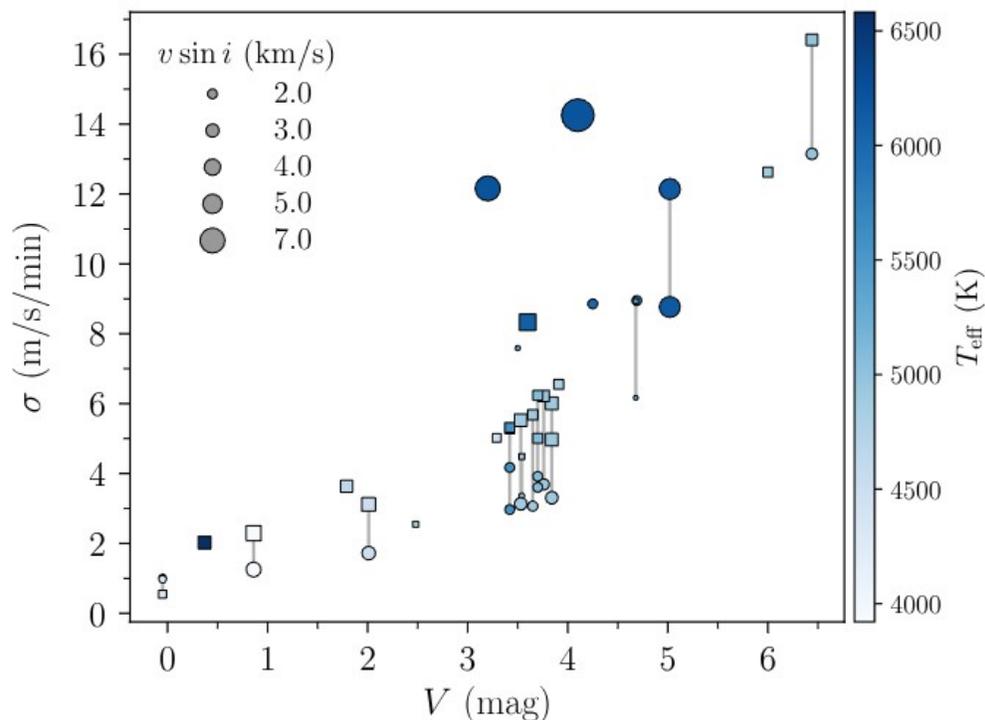
At the APO site, we have in addition to λ Ori started observations on the Hyades giant ϵ Tau.

Several programs are running long-term in filler mode at the different sites, mainly focusing on the monitoring of binary and exoplanet systems.

4. Operations, Instrument and Data processing and archive

4.1. As part of a coming SONG status update paper, focusing on the status of the network and the data available via SODA, we have prepared the following plot of the relation between the RV uncertainty and the stellar visual magnitude (based on stars observed at OT). Circular markers indicate measurements made with the current QHY detector, while square markers indicate measurements made with the previous ANDOR detector. Lines connecting markers indicate observations made of the same target.

The general trend from the QHY vs. ANDOR comparison suggests that the RV precision for the QHY is significantly better. This is mainly due to the much (factor 3.6) better sampling for the QHY. We are now using slit 8 only, and the increased sampling improves the *pyodine* modelling and fully samples the intrinsic resolution of the spectrograph. The ANDOR detector barely managed 2-pixel sampling of the instrumental profile.



5. Scientific highlights

- 5.1.** Since the last newsletter Hans Kjeldsen et al. have published the asteroseismic analysis of β Aql: “Asteroseismology of the G8 subgiant β Aquilae with SONG-Tenerife, SONG-Australia and TESS” ([link to ADS](#))
- 5.2.** Gupta et al. studied the He glitch in μ Her based on SONG data in the paper entitled: 'Glitch analysis and asteroseismic modelling of subgiant μ Herculis: confirming and interpreting the Γ 1 peak as the helium glitch' ([link to ADS](#))
- 5.3.** An analysis of the binarity of the prime SONG target μ Her, by Marcus L. Marcussen et al., is currently in review at A&A. This analysis, including a significant contribution from SONG observations, solves the full quadruple system of μ Her and provides an independent mass for the primary star – this makes μ Her a key benchmark system for asteroseismology.



6. SONG Policies

6.1. Data policies

SONG data are made openly available to the SONG community through the SONG Data Archive (SODA) webpage – soda.phys.au.dk.

SONG provides three data products:

1. Raw uncalibrated 2d spectra
2. Calibrated and extracted spectra
3. Radial-velocity time-series

Within a few days of the observations raw and extracted spectra are made available on SODA.

Radial-velocity time-series on specific targets can be requested by e-mail to the Instrument Scientist.

Proprietary period:

A proprietary period of up to one year can be requested in special circumstances, for example if the data are part of a PhD or Master thesis project. Requests for a proprietary period are sent to the Science Coordinators and the Executive Director of Operations.

6.2. Publication policies

It is highly recommended that any publication is discussed within the relevant working group and as a minimum communicated with the working group chairs.

It, is in the interest of the SONG network as a whole as well as for each individual research scientists within the SONG community that publications are accurate, that credit is fair to the authors and other contributors and that the data and the science results should be provided to the scientific community and the public in a timely fashion.



General Procedure:

1. It is strongly encouraged that any publication including SONG data which is ready for submission should be uploaded through SODA to the SONG Publication Review Panel. The panel will check the acknowledgments and technical description of the SONG instruments, and might provide the PI with a list of members from the SONG team to be considered for co-authorship.
2. Any SONG team member offered co-authorship on a publication has to actively accept/decline the offer by replying yes/no to the PI or first author of the given paper. If no reply is given it is regarded as a decline.

Acknowledgments:

It is expected that any publication using SONG data includes one of the following acknowledgments:

1. "Based on observations made with the SONG network of telescopes operated by Aarhus University, Instituto de Astrofísica de Canarias, the National Astronomical Observatories of China, University of Southern Queensland and New Mexico State University".
2. "This publication includes observations made with the SONG network of telescopes operated by Aarhus University, Instituto de Astrofísica de Canarias, the National Astronomical Observatories of China, University of Southern Queensland and New Mexico State University".

Including the acknowledgment ensures proper recognition of the contributions made by the SONG network and its partner institutions.

Failure to include this acknowledgment may lead to follow-up communications or affect future access to SONG data.

For proper attribution, it is also recommended to reference relevant publications that describe the SONG network, where applicable. These can be found in the "reference papers" section below.



Reference papers:

To reference the SONG instrumentation, robotic execution of the observations and reduction and extraction pipeline please cite the following publications:

- [Instrumentation and data pipeline]:
*First Results from the Hertzprung SONG Telescope:
Astroseismology of the G5 Subgiant Star μ Herculis* – [Link](#)
- [Robotic SONG observations]:
Conducting the SONG: The Robotic Nature and Efficiency of a Fully Automated Telescope – [Link](#)

Please ensure these references are included where relevant in any publication that uses SONG data to appropriately acknowledge the work and contributions of the SONG team.

General Guidelines for Authorship:

The following general guidelines are recommended to ensure fair and transparent authorship practices for SONG-related publications:

1. **Primary Author:** The individual responsible for conducting the majority of the work (the primary author) shall be listed first in the authorship list.
2. **Order of Co-Authors:** The primary author determines the order of co-authors, including SONG team members who have accepted co-authorship.
3. **Substantial Contributions:** Any individual who writes or makes substantial contributions to any part of the publication is entitled to be included in the authorship list, provided they so choose.
4. **Review and Agreement:** All authors listed in the publication are expected to read a draft version of the paper, provide timely feedback to the primary author, and indicate their agreement with the content. Suggestions for improvement, if any, should also be communicated during this review process.



Image of the SONG site at the Lenghu Observatory taken in late 2025.



Panoramic view from the SONG site at the Observatorio del Teide in Tenerife on 26-03-01. Credit: Mads Skakke Fredslund.

If you have any comments, inputs or suggestions to the future SONG newsletter(s) please feel free to send an e-mail to:

Executive Director of SONG operations:
Mads Skakke Fredslund
madsfa@phys.au.dk



Links

Official SONG project web page (needs to be updated):

song.au.dk

Unofficial technical operations web pages:

song.phys.au.dk

SONG data archive, Working Groups and user input web page:

soda.phys.au.dk

Note: The above three web pages might be merged into one in the future.

Node information web pages:

Teide Observatory common weather page: ocan.iac.es/meteo/OT/

Mt. Kent Observatory weather page: astroweb.unisq.edu.au/site/weather.php

Lenghu Observatory web page: lenghu.china-vo.org

Apache Point Observatory web page: apo.nmsu.edu

NMSU (APO) SONG project wiki page: astronomy.nmsu.edu/song-wiki/start

Institutional web pages:

Aarhus University, au.dk

Instituto de Astrofísica de Canarias, iac.es

National Astronomical Observatories China: nao.cas.cn

University of Southern Queensland, unisq.edu.au

New Mexico State University, nmsu.edu