



Guidelines for Proposals for observations with the BRITE-Constellation nano-satellites

Observations with the BRITE-Constellation

The five BRITE-Constellation nano-satellites – *UniBRITE (UBr)* and *BRITE-Austria (BAb)* launched in 2013; *BRITE-Lem (BLb)*, *BRITE-Heweliusz (BHR)* and *BRITE-Toronto (BTr)* launched in 2014 – are measuring light variations in stars brighter than typically $V=5$ mag, although in some cases observations down to about $V=7$ mag can be conducted as well. Three satellites (*UBr*, *BHR* and *BTr*) carry a red filter (550 -700 nm), two satellites (*BAb* and *BLb*) a blue filter (390 – 460 nm).

Observations require at least 3 stars brighter than $V=3$ mag in the unvignetted BRITE field-of-view of ~ 24 square degrees to ensure safe operations of the nano-satellites. The strategy of the BRITE Constellation is thus to observe **large fields** with typically **15 to 20 targets brighter than $V=6$ mag, including at least 3 stars brighter than $V=3$ mag**. Each field is observed **at least 15 minutes per satellite per orbit (~ 100 min)** and **for up to half a year**. All nano-satellites can be pointed together at a single field or a subset of them can be used.

With the five BRITE-Constellation nano-satellites being operational for a few years already, we understand the instrumental capabilities and limitations. In particular, we use chopping to reduce the impact of high energy particle hits on the detectors on the scientific data, very bright stars ($V<2$) can undergo non-linear effects, and the Photometry Tiger Team (PHOTT) developed sophisticated methods for data reduction and analysis. See [Pablo et al. 2016](#) for more details.

- Observations in the **blue filter** using the **BAb and BLb satellites** can be conducted in good quality for stars brighter than $V=4$ mag if the stars are of spectral types **O to mid B**. Bright red stars of, e.g. G and K spectral types appear 2-3 mag fainter in the BRITE blue filter at a fixed exposure time. For a hot 4th magnitude star observed in the blue filter, the point-to-point scatter (rms noise) of the collected photometric data during that 15 minutes collection time is about 0.001-0.005 mag depending on FOV position and environmental conditions (see Figure 1).
- Observations in the **red filter** using the **UBr satellite**, can be conducted in good quality for stars brighter than $V=4$ mag of **any spectral type!** The point-to-point scatter (rms noise) of the collected photometric data during that 15 minutes collection time is about 0.001-0.005 mag depending on the field-of-view (FOV) position and environmental conditions (see Figure 1).
- Observations in the **red filter** using the **BHR and BTr satellites** can be conducted in good quality for stars as bright as $V=4$ mag with a rms noise of typically 0.001-0.003 mag (see Figure 1). With longer exposure times (up to 5 sec) applicable for those two satellites **only**, stars even as faint as 6.5 - 7 mag can be observed. For those the point-to-point scatter (rms noise) of the collected photometric data during that 15 minutes collection time can then be expected in the range 0.005-0.010mag depending on FOV position and environmental conditions.

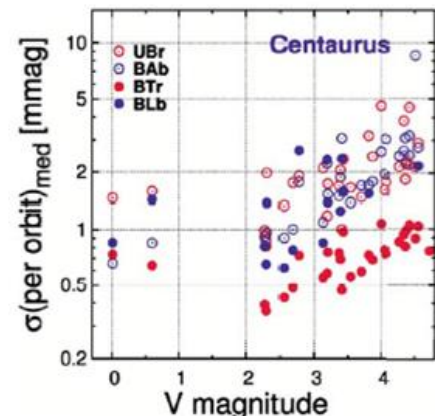


Figure 1: Quality of the BRITE photometry.

We offer the opportunity to the international scientific community to raise new topics or targets that can be studied with the BRITE-Constellation of nano-satellites, under the prerequisites described above.



Who can submit a Proposal?

Proposals can be submitted by **anyone** interested to work on photometric time series observable by the BRITE-Constellation, irrespective of the location of the PI's scientific affiliation.

Preparing a Proposal

Proposals should not be longer than **two pages** and should include

- a title
- the name, affiliation and contact information of the PI and (if applicable) co-Is
- a scientific justification including an explanation why the cadence of BRITE-Constellation is sufficient and the long time base is needed.
- a technical justification, in particular regarding the number of nano-satellites required (i.e. duty cycle), the need for red, blue, or both colors, the minimum required duration of the run etc.

In addition, the authors should provide

- a list of the target(s) of interest
- optionally suggestions for the possible field(s), including the target(s) of interests as well as other bright stars located nearby.

This information about targets and fields is not counted against the 2-page limit.

Data Policy

In case a proposal is accepted, reduced data will be released to the PIs as soon as possible after completion of observations. If a target has been approved for more than one PI, the BEST chair informs all proposers sharing that target and facilitates collaboration among them. The proposers must nominate one among them who acts as the Contact PI with BEST. BEST expects a first status report on the data analyses from each Contact PI within three months of their receipt of the reduced light curve(s). All PIs should be aware of the **one-year proprietary period** of BRITE-Constellation data and that BEST strives for a fast publication process. More information can be found in the [BRITE Bylaws](#).

What targets can be proposed?

Any target meeting the criteria for BRITE-Constellation observations described above can be proposed, without restriction on coordinates.

Please note that observations are more likely to be scheduled if the targets are in already selected fields which are mostly in the Galactic plane due to technical reasons. Accordingly, single targets at high Galactic latitude would require a very attractive justification.

If the target has already been observed by BRITE and you do not need new observations, you are free to contact the Contact PI of this target for collaboration (without submitting a proposal). If the target is already scheduled for observations and has been assigned to one or more different PIs, you can still submit it in a proposal. Synergies with already scheduled observations may be an asset. The rules described above will then apply, i.e., your name will be added to the pool of possible contact PIs for this star. Please address any further questions to Proposals-BRITE@uibk.ac.at.

What if I responded to a previous Announcement of Opportunity or Call?

The selected programs from previous Announcements of Opportunity (AOs) and Calls are the current basis for selection of BRITE targets, PIs and Contact-PIs. We will merge the new proposals with the inputs from previous AOs and Calls. Therefore, if you responded to a previous AO and have no new science goals or targets to propose, no action is required from you. You can, however, submit a new or updated proposal if you wish to bring new information, science objectives, or targets to the attention of BEST.



Neither is any action required from colleagues with previously selected BRITE AOs who have already agreed to withdraw from their PI-ship and pass it on to others.

Submission of the Proposal

Please send your proposal as a **single pdf file** via email to Proposals-BRITE@uibk.ac.at

Review of proposals and selection

All proposals and targets will be evaluated by BEST on the basis of their scientific merit. Accepted targets will be included in the list of possible BRITE targets. The applicants will be informed on the selection of their targets for observation as soon as the selection is made. This is typically done one year in advance of the observation to allow PIs to organize ground-based supporting observations of their targets.

Resources for Proposers

- To check all the stars and fields that have already been observed by the BRITE-Constellation since 2013 or that are currently proposed or scheduled for observations, please refer to the [BRITE photometry wiki site](#).
- Publications describing technical aspects of BRITE-Constellation
 - [Weiss et al. 2014, PASP, 126, 573](#)
 - [Pablo et al. 2016, PASP, 128, 125001](#)
 - [Pigulski et al. 2017, A&A, 605, 26](#)
 - [Pigulski et al. 2018, arXiv:1802.09021](#)
 - [Pigulski A., 2018, BRITE Cookbook 2.0](#)
 - [Pigulski, A. 2018, arXiv: 1801.08488](#)
- For general information about BRITE-Constellation, please visit the [webpage](#). On this webpage you can also find a description of opportunities to obtain (simultaneous) ground-based observations coordinated by the BRITE-Constellation Ground-Based Observing Team (GBOT).
- Rules on data handling and publication are described in the [BRITE Bylaws](#). Every BRITE PI is obliged to follow these rules.