

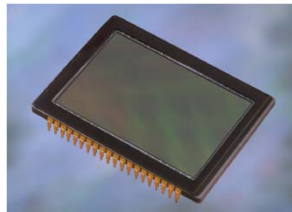


Contents

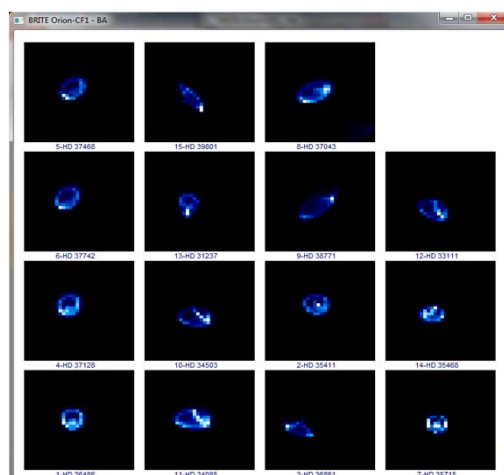
- Introduction
- Scientific goals of BRITE Constellation
- BRITE Characteristics
- Scientific Results
- Summary and Outlook

Scientific Goals

- Measurement of brightness and temperature variations of massive luminous stars (brighter than visual magnitude 4)
- Observations: 6 months typ.
- High duty cycle
- 2-colour (blue and red): satellites operate in pairs
- 24° field of view

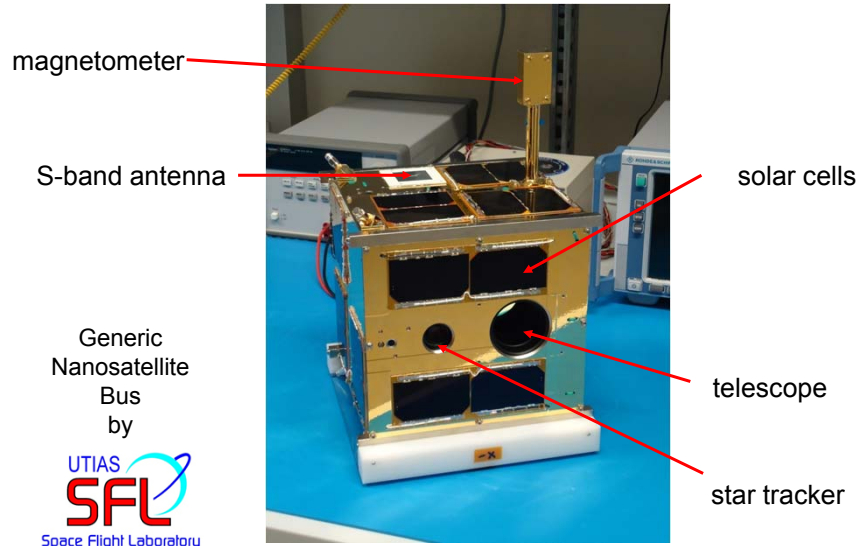


Raster Photometry



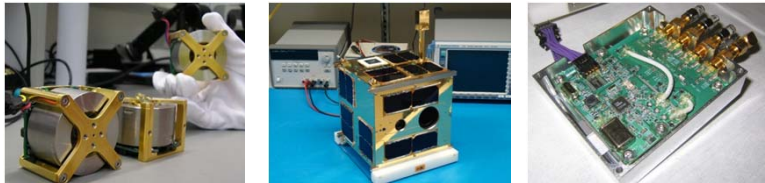
High pointing accuracy required: 1 arcminute

TUGSAT-1/BRITE-Austria Flight Model



BRITE Characteristics

- Nanosatellite: 20 x 20 x 20 cm
- Mass: 7 kg
- Electrical power: 6...11 W
- Transmit power: 0.5 W
- Frequency bands: S-band downlink / UHF uplink
- Data rates: 32...256 kbit/s downlink, 9.6 kbit/s uplink
- Pointing accuracy: 1 arcmin.
- Science data volume: 18...40 MB / day per satellite

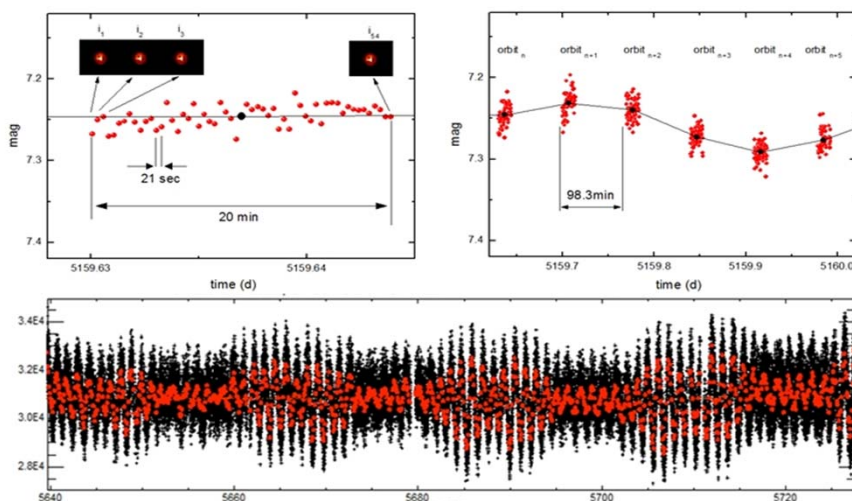


Mission Operations

- 14 orbits per day , 6-7 passes per station
- Operations:
 - Graz: BRITE-Austria and UniBRITE
 - Toronto: BRITE-Toronto
 - Warsaw: BRITE-Lem and BRITE-Heweliusz

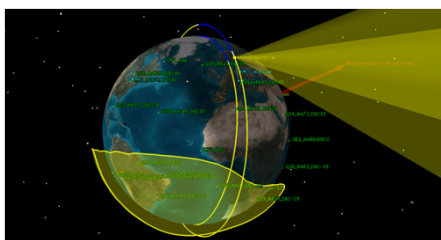


BRITE-Constellation: Data Sampling



Target Selection

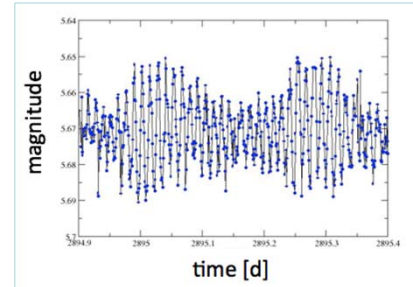
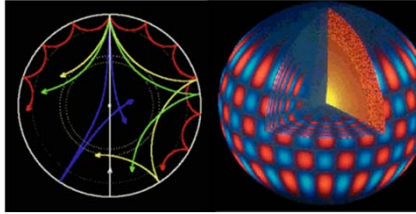
- BRITE Executive Science Team (BEST)
- Scientists from Austria, Canada, Poland, Germany, France
- BEST defines targets
- Commands for spacecraft prepared and uploaded by the operations teams



The world's smallest astronomical space satellites discovered the biggest stellar heartbeat



Stellar Pulsations



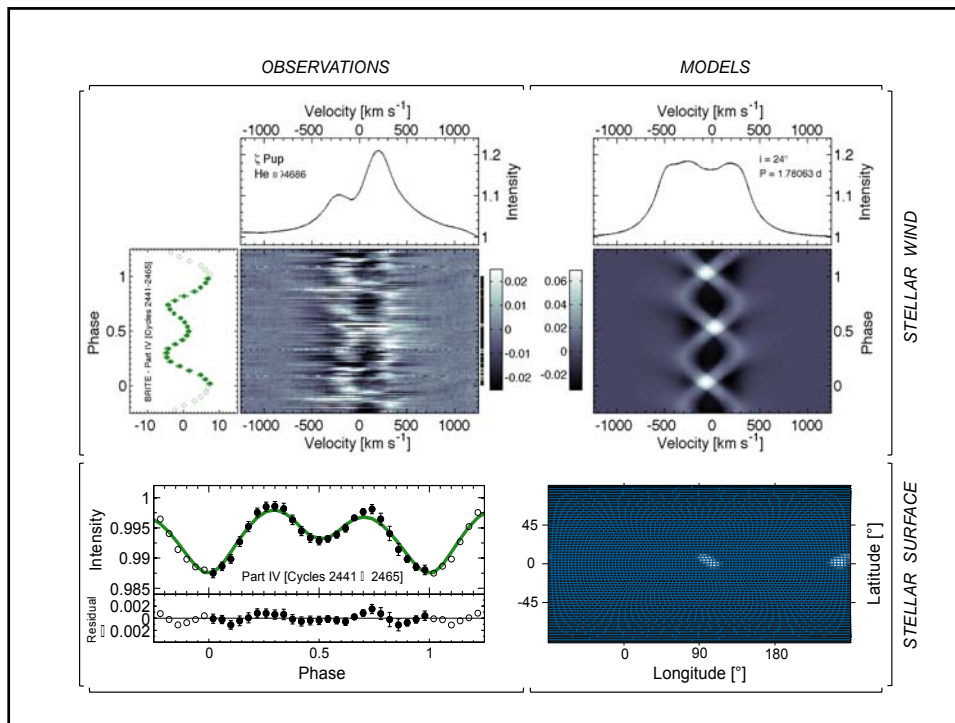
- Frequency
- Amplitude
- Phase



- Type of pulsation
- Properties of stellar interior

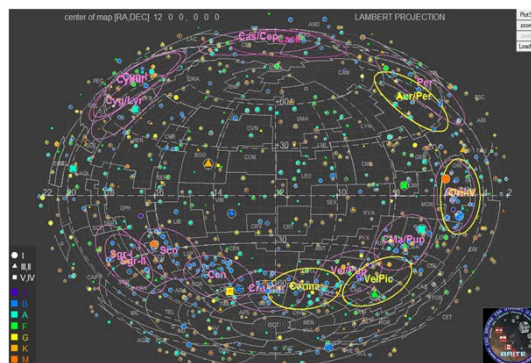
Synergies

between ground-based observations and Space-based photometry (BRITE) provide the only way to model the physics of a distant star



BRITE-Constellation: Observing Fields

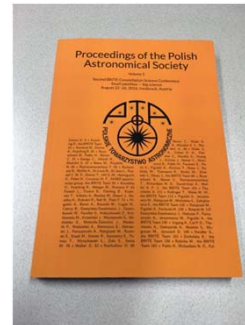
- 30 fields completed
- 5 fields ongoing



- 450 stars observed thus far
- 3.5 million measurements

Publications

- 14 peer-reviewed papers in top journals, e.g.
 - Astronomy and Astrophysics (top Europe)
 - Astrophysical Journal (top US)
- More than 60 articles in various conference proceedings
- Innsbruck proceedings (74 articles)
- Montréal proceedings in preparation



BRITE Science Conferences

- 2015: Gdansk (Poland)
- 2016: Innsbruck (Austria)
- 2017: Montréal (Canada)




- More than 60 scientists participated in each conference

The Future

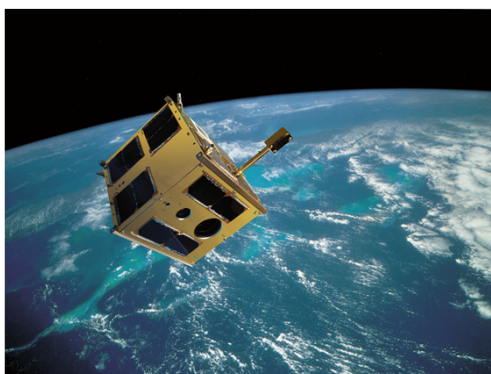
- Current performance evaluation:
BRITE can deliver scientifically relevant data beyond 2020
- BRITE Science meeting in Wroclaw (Aug.2018)
- BRITE Science Conference Vienna 2019

Conclusion

- BRITE-Constellation is operating since Feb. 2013
- 5 satellites are collecting data every day from 3 ground stations
- Small, inexpensive spacecraft can fulfill demanding scientific objectives
- Significant scientific output from BRITE Constellation



Results are based on data collected by the BRITE Constellation satellite mission, designed, built, launched, operated and supported by the Austrian Research Promotion Agency (FFG), the University of Vienna, the Graz University of Technology, the Canadian Space Agency (CSA), the University of Toronto Institute for Aerospace Studies (UTIAS), the Foundation for Polish Science & Technology (FNI TP MNiSW), and National Science Centre (NCN)



Thank you for your attention!