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WHO ARE WE?

- The UK Fireball Network (UKFN) uses autonomous cameras to continually monitor the night sky to capture fireball events as they enter the Earth's atmosphere [1].
- This is part of a larger effort by the Desert Fireball Network (DFN), based at Curtin University, Australia, to ultimately create a Global Fireball Observatory [2].
- Primary aim: to provide accurate fall locations of any surviving meteorites, allowing for rapid recovery, and orbit calculation to find its place of origin in the solar system.
- Collaboration between Imperial College London, the University of Glasgow and Curtin University.

CAMERA SETUP

- UKFN uses DFNEXT cameras.
- Uses a 8-mm stereographic fish-eye lens.
- Takes one long exposure image every 30 seconds.
- Onboard camera performs automated event detection, and if an event is detected, neighbouring cameras are autonomously checked to see if they also observed it.
- Fireball velocities and trajectories are calculated using a de Bruijn sequence embedded in the image. This provides absolute timing data with temporal precision < 1 ms after triangulation [3].



Figure 1: Installation of the Lincolnshire (left) and Surrey (top) DFNEXT cameras.

NETWORK COVERAGE

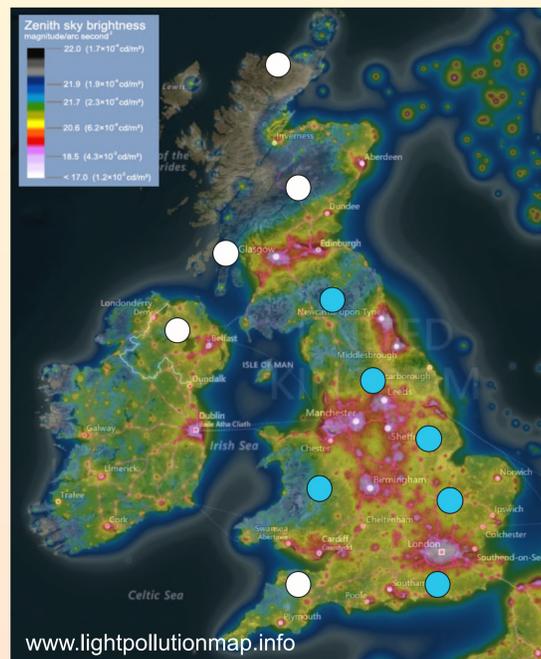


Figure 2: Zenith light pollution map of the UK with the blue dots marking the installed cameras to date, and the white dots showing planned installation locations.

- Six cameras are installed/in progress, covering the majority of the sky above England and Wales.
- Each camera has a field of view of 150 km radius.
- Five further cameras planned in the future, providing nearly double-station coverage of the skies over the UK.
- Anticipated to observe 1-2 meteorites of a searchable size per year [4].
- Light pollution is the main issue we face in the UK; anywhere 20.6 or higher (Fig. 2: yellow-black) are considered optimum locations, but this is not always possible in the UK.

CAMERA SIGHTINGS

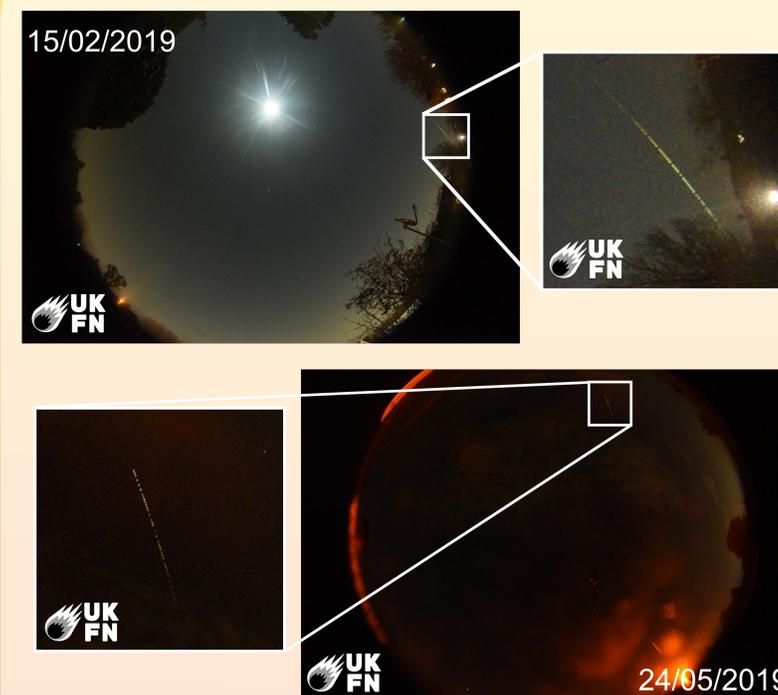


Figure 3: Fireball observations from Surrey and Lincolnshire UKFN cameras.

UKFALL: UK FIREBALL ALLIANCE

- UKFall is a collaboration between the other UK-based meteor/fireball networks, such as the UK Meteor Observation Network (UKMON), the System for Capture of Asteroid and Meteorite Paths (SCAMP), the Natural History Museum and the National Museum Cardiff.
- Protocol has been established for when a meteorite of searchable size has been observed by several fireball networks.
- A meteorite fall has not been recovered in the UK for nearly 30 years; together we plan to rectify this.



UK Fireball Alliance

FIREBALLS IN THE SKY

- DFN have developed a free app with Thoughtworks, called Fireballs in the Sky, available on iOS and Android.
- It allows members of the public to repost a sighting using their smartphones.
- Through citizen scientists using this app, fireball data sets have been greatly enhanced.



Get Involved!

Download the app using the QR code or search 'Fireballs in the Sky' in the app store.



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References: [1] P.A. Bland et al. (2012) *Aust. J. Earth Sci.* 59:2:177-187. [2] R.M. Howie et al. *Exp. Astron.* 43:3:237-266. [3] R.M. Howie et al. (2017) *Meteorit. Planet. Sci.* 52:8:1669-1682. [4] M. Zolensky et al. (2006) *Meteorites and the Early Solar System II* 869-888. [5] P.A. Bland, et al., (2014) *Elements*, 160-161.