A GLOBAL FIREBALL OBSERVATORY. E. K. Sansom, H. A. R. Devillepoix, P. A. Bland, M. C. Towner, M. Cupák, Space Science & Technology Centre (SSTC), Curtin University, Australia.

Introduction: The meteorite collections contain a very rich picture of what the early solar system would have been made of, however the lack of spatial context for these samples is an issue. The asteroid population is equally as rich in surface mineralogies, hence mapping the two populations together is a major challenge for Planetary Science. Directly probing asteroids achieves this at a high cost. Observing meteorite falls and calculating their pre-atmospheric orbit on the other hand, is a cheaper approximation. This has been done for over 50 years, and the number of successes has increased significantly in the last 10/15 years.

The global collaboration: The Global Fireball Observatory (GFO) collaboration was established in 2017 and brings together 14 institutions (from Australia, USA, Canada, Morocco, Saudi Arabia, and the UK) to maximise fireball observation time and therefore meteorite recoveries. The members have a choice to operate independently, but they can also choose to work in a fully collaborative manner with other GFO partners. This efficient approach leverages the experience gained from the Desert Fireball Network (DFN) pathfinder project in Australia. The state-of-the-art technology (DFN camera systems and data reduction) and experience of the support teams is shared between all partners, freeing up time for science investigations and meteorite searching. The GFO has the objective of covering 2% of the Earth in the early 2020s, bringing new, fresh, extra-terrestrial material to the labs, and yielding new insights about the formation of the Solar System. With now close to 40 meteorites recovered with orbits, we already have several samples of less common meteorites (notably HEDs, carbonaceous chondrites, enstatite chondrite, ureilite). Although not quite a statistical anomaly yet, the recovery of an iron meteorite is overdue, and will certainly be one of the highlights in this growing field of research over the next few years.