

including those associated with solar variability and its long-term evolution, the effects of a supernova or gamma-ray burst close to the Solar System, a rare stellar passage through the Oort cloud, and even the ultimate fate of the Universe. Life's end poses questions as deep as those of its origin, and it would have been interesting to have seen a summary of key points arising from the contributions missing from these proceedings and the round-table discussions.

The book, conceived before the COVID health emergency but occurring (perhaps ironically) during health restrictions associated with the pandemic, unfortunately does not achieve its promise. Instead, most sections focus on different aspects of the near-Earth asteroid (NEA) impact hazard. While that might be a significant long-term threat to life on Earth (the threat to humanity is much greater), it is only one of many possible astronomical influences facing the evolution of life, whether on Earth or elsewhere.

Still, there are interesting papers. The editor's introduction gives a useful summary of various astronomical hazards that might occasionally affect life on Earth; several contributions show how different aspects of the impact hazard are now part of the corpus of 'normal' astronomical research, demonstrating how far the modern subject has advanced from its origin forty years ago in the weeds of the 'giggle' factor. There is a nice discussion of lunar impact events, and of possible fireballs that might be linked to the c. 370-m-diameter Apophis, which will pass within an astronomical whisker of Earth on 2029 April 13. Other papers discuss the relatively short (several Myr) time-scale for overturn of the observed NEA population, and how all-sky observational surveys will soon revolutionize our knowledge especially of small members of the population, presumably fragments of larger bodies.

In summary, this book will appeal to NEA specialists but probably not to the wider community of researchers suggested by its broad title. The cost, at nearly a pound a page, is disappointing. — MARK E. BAILEY.

Astronomy and Satellite Constellations: Pathways Forward (IAUS 385), edited by Peter Grimley, John Barentine, David Galadi-Enriquez & Constance Walker (Cambridge University Press), 2026. Pp. 264, 25 × 18 cm. Price £98 (hardbound; ISBN 978 1 009 39922 7).

This is a review of the printed proceedings of IAU Symposium 385 (IAUS 385) held on 2023 October 2 in La Palma, Canary Islands, Spain.

This is only the second IAU symposium I've attended in-person; the first was IAUS 90^{1*}. Curiously, CUP's on-line portal, Cambridge Core, has an information panel showing a date of 2024 December but published on 2026 January 19.

Given the rapidly moving subject of satellite launches and megaconstellations, the publication delay relegates the excellent papers published here to being an historical collection rather than a timely, useful work feeding promptly back into the community[†] — a point equally bemoaned by Helbig in his review² of the proceedings of IAUS 368.

The symposium was organized by the IAU Centre for the Protection of the Dark and Quiet Sky (IAU CPS) and partitioned according to the four 'hubs' within CPS: Community Engagement Hub, SatHub, Policy Hub, and Industry & Technology Hub. The total of forty-five papers in these proceedings are organized mostly in the order of the presentations in the programme, with about ten of those being separately contributed and poster-related papers following the others.

*For context, there was no 'on-line version' in 1979 as the internet really didn't take off until about four years later and the world wide web came about six years after that!

†The rapid growth of satellite megaconstellations is an *existential* problem for terrestrial astronomical observations and a growing challenge for orbiting observatories; astronomical research is under threat from fast-moving, politically unconstrained commercial interests and academic publication timescales are too slow!

Unfortunately there are about 35 presentations not present in the proceedings and no detailed report on the public session with UN Delegates & Observers held on the last day. Also, unlike the IAUS 90 proceedings, there is no inclusion of any Q&A discussion following each presentation though I certainly recall many such discussions. As such, these proceedings are not a complete representation of the symposium; perhaps there should have been more incentive for symposium contributors to submit papers for publication in the proceedings?

I agree with Helbig²: I find the paper used to be too thin with some text and dark/shaded diagrams showing through the paper.

There is a list of symposium participants but it doesn't distinguish between those who attended in-person and those who were on-line. Perhaps either an additional column for that list denoting in-person/on-line attendance or simply italicizing the names of those who were on-line would have made it clear. Also, it would have been a useful courtesy to include a key to the faces shown in the group photographs as was done for IAUS 90¹.

There is no use of colour in the book at all, maintaining a grey-scale for all of the figures. However, the on-line version uses colour for all submitted papers that included colour (including the symposium group photographs). Both Helbig² and Phillipps³ mentioned the lack of colour in their respective reviews of IAU symposium proceedings (both published by CUP) with Helbig commenting that the printed version is more likely to be purchased by libraries and Phillipps suggesting that the lack of colour may be unimportant since the on-line version is likely to be more accessible to researchers (depending on the type of access).

That may also be true for other submitted papers but, comparing the source material of my own submission to these proceedings (p. 113) with what has been published, I noticed that the pie-chart figures have been significantly re-organized to optimize the use of space. Unfortunately, the associated pie-chart legends, kept with the relevant text, often became overly separated from their pie charts, necessitating a lot of page-flipping to match the legends to the pie slices.

In summary: for the price I would have expected a more complete record of the symposium, better-quality paper, and more use of colour. This is, however, a fair collection of papers covering a reasonably wide range of topics but, sadly, with about half of the presentations not appearing as papers and no post-presentation Q&A discussions included. For a topic of such importance to astronomy and its practitioners, the delay between the symposium and the publication is unhelpful. — PAUL A. DANIELS.

References

- (1) I. Halliday & B. A. McIntosh (eds.), *Solid Particles in the Solar System (IAUS 90)* (D. Riedel Publishing Company), 1980.
- (2) P. Helbig, *The Observatory*, **146**, 96, 2026.
- (3) S. Phillipps, *The Observatory*, **146**, 97, 2026.

Grubb Dublin and Grubb Parsons, by Ian S. Glass (Centre for Astronomical Heritage), 2026. Pp. 340, 29.7 × 21 cm. Price £0 (open access) (on-line PDF file; ISBN 0 7503 0454 5 (previous edition)).

[This book is an expanded and updated edition of *Victorian Telescope Makers: The Lives and Letters of Thomas and Howard Grubb* (Institute of Physics Publishing Ltd), 1997, original ISBN 0 7503 0454 5. The copyright was ceded to the author in 2008. With many photos, traditional paper publication would be prohibitively expensive. It is freely available as a PDF file (formatted like a traditional book, and with both a fancy on-screen-reading interface and a link to the plain PDF file) at <https://cfah.org.za/resources/grubb-glass> and, with the permission of the author and in the interest of