atomic power or lasers, it will, however, interest readers who enjoy the personal and historical sides of science. The reader may also find this lesser-known area of physics interesting in its own right. As Mark Wolverton writes, "Cosmic rays remain one of the most intractable scientific puzzles of all time." — Paul Simeon.

At the Crossroads of Astrophysics and Cosmology: Period–Luminosity Relations in the 2020s, edited by Richard de Grijs, Patricia A. Whitelock & Márcio Catelan (Cambridge University Press), 2024. Pp. 333, 25·5 × 18 cm. Price £120/$155 (hardbound; ISBN 978 1 009 35304 5).

The best-known period–luminosity (P–L) relation in astronomy is undoubtedly that for Cepheid variables, discovered (as several of the chapters in this volume tell us) by Henrietta Swan Leavitt, though the powers-that-be have not (yet?) persuaded most practitioners to call it the Leavitt Law. Actually there are many such laws for many kinds of Cepheid variable stars and many other categories. The volume and the symposium it reports address only stellar sources (including binaries), though reverberation mapping of active galaxies (AGN) has a bit of the same flavour.

Did the SOC manage to corral a presentation touching on every known variable category? Not quite. Only the editors' preface mentions ZZ Ceti, V777 Herculis, and GW Virginis, pulsating white dwarfs of spectral types DA, DB, and DOther, which have their own instability strips, but were presumably declared not relevant to cosmology. I am not quite sure this is true, given potential implications for the ages of various stellar populations. But beta Cep, roAp, delta Sct, and gamma Dor do appear among the less-famous classes, not to mention BL Her and SX Phe. And yes, binaries, because the Roche geometry forces a period-separation–stellar-size limit that leads to a correlation of period and absolute brightness.

The front matter lists names of 126 participants, with no affiliations or countries of residence given (those appear only for first authors of the 27 articles). The conference photo, in glorious black and white like all the rest of the volume, is compressed onto a standard single page in portrait format and probably includes a comparable number of people, about whom it can be said that most paid the registration fee (name badges displayed) and at least those in the front row appear to have two legs each and shoes.

Wendy Freedman and Barry Madore are given the first word, on past, present, and future of the Cepheid extragalactic distance scale, and several other papers look specifically at Cepheids (including Type II's and anomalous Cepheids). Stars at the tip of the red-giant branch also get a fair amount of attention. In comparison to earlier studies of variable stars, the dominant impression here is MORE. Data on very many variables have recently come — or are coming — from the *Kepler* mission, OGLE, and *Gaia*. *JWST* is proving its worth both by extending P–Ls into the infrared and also by angular resolution much improved from *HST*. Cepheids in double-lined eclipsing binaries and in open clusters have become routine sources of extra information, though they were, once upon a time, thought not to exist.

Several things left me puzzled. There is a map of Japan (p. 164) showing the location of four 20-metre antennae spread somehow across the country, but the outline is an oval, and no islands are shown. The array is being used to measure parallaxes and circumstellar masers of massive AGB stars. The first author is A. Nakagawa of Kagoshima University, who undoubtedly knows where the antennae are.

Second, one paper discusses the variability (at the level of millimagnitudes) of red supergiants. I had thought of such stars as displaying just a few really big rising and falling convective blobs, which I would not have described as "granulations". Seeking enlightenment from our friend Google, I lit first on a reference to this book chapter and second to the journal article reporting roughly the same information from the same authors.

My third puzzlement concerned a paper dealing with the Period–Wesenheit relations for anomalous Cepheids (though with brightnesses between the two normal types of Pop I and Pop II). Who, I wondered, was Wesenheit? No references with that author's name cited in the paper carrying that title (or any of the others). Could it possibly be a word, not a name? Sounds German. Dust off German–English dictionary from grad school. Well, 'heit' is a particle that turns an adjective into a feminine noun. But Wesen is already a noun (spirit, essence, or some such). Back to the target paper. Lots of light-curves and an expression defining W, but no explanation of the name. Google to a paper by Barry Madore in 1982, which blames or credits our good friend Sidney van den Bergh 1975. Oops. His chapter in Vol. 9 (the last of the eight published) in the Kuiper Compendium, Stars and Stellar Systems. Not on ADS. Query a native speaker of German about the word, which he said is something like essence, but not obvious why it is part of a period–luminosity relation. Back to Madore; well, it is a combination of colours that will remove the effects of reddening if you have the good luck already to know that ratio of total to selective absorption in the colour system you are using, for instance, $A_v = 3{\cdot}1 \times E(B-V)$. And a visiting colleague has just suggested that perhaps Wesenheit is more informative in Dutch. — Virginia Trimble.

Early Disk-Galaxy Formation from JWST to the Milky Way, edited by Fatemeh Tabatabaei, Beatriz Barbuy & Yuan-Sen Ting (Cambridge University Press), 2024. Pp. 133, 25 × 18 cm. Price £110/$145 (hardbound; ISBN 978 1 009 39875 6).

This slim volume is the proceedings of IAU Symposium 377, held in Kuala Lumpur, Malaysia, in 2023. According to the preface the meeting was the first in South-east Asia since 1990 and was intended as a vehicle for raising the profile of astronomical research in Malaysia. There are 20 papers in two sections, 'Galaxies and Cosmic Dawn' and 'Milky Way and M31' plus a single paper on 'Astronomy in Malaysia' (which concerns the possibility that the creation of an ancient inscription was inspired by the AD 760 apparition of Comet Halley). The first section covers a range of topics, most of which have been, or could be, addressed by *JWST* observations, particularly at very high redshifts. The second section is more focussed, with several papers on chemical abundances in early Milky Way stars. Many of the papers are individually very interesting, but the volume as a whole is no more, arguably rather less, than the sum of its parts. Most contributions have already been published elsewhere, where the reader will actually be able to see the magenta crosses, orange dotted lines, *etc.*, alluded to in one figure caption, unlike in the entirely monochrome figure reproduction here. It is also noticeable that since the IAU Symposium volume which I reviewed last year (No. 374), the price has risen by 12%, despite No. 377 being only 40% of the length. It is hard to imagine there being any individual buyers at more than £5 per article, though libraries with long-term CUP/IAU contracts will presumably receive it, even if it never subsequently leaves their shelves. — Steve Phillipps.