**Planetary Geology : an Introduction** (2nd Edition) by Claudio Vita-Finzi & A. Dominic Fortes, pages 206, Dunedin Academic Press Ltd, 2013, Price ~$60, ISBN: 9781780460154 **(paperback).**

*“Planetary Geology”* is an exceptionally well conceived book that should be both compulsory reading for all university-level geoscience students, and highly recommended reading for all amateur astronomers with an interest in our planetary neighbourhood. It is lucidly written by two authors whose grasp of the subject is as impressive as it is comprehensive ; their lectures must be very stimulating! In addition, it is exceptionally well illustrated with clear diagrams and high-resolution images integrated into the narrative, many of which are in colour. All of which comes at a cost : publishing constraints in order to limit price.

Accordingly, the authors have opted for a very effective strategy in composing this book. First, “*Planetary Geology”* is presented as a series of thematic chapters, ranging from planetary origins, orbits and cycles, via planetary construction, interiors and exteriors, endogenous and surface processes, to atmospheres, oceans and ice caps, and planetary biology. Each thematic topic is illustrated with tangible examples drawn from throughout the Solar System (and sometimes beyond). Second, the text is intentionally punchy and rapid-fire, locally with a smattering of wry humour (e.g. *“… contrary to some opinions, planets do not simply get in the way of real astronomy”*). The authors do not have room to explain everything, but their delightful use of prose readily achieves their intent to get their readers to grasp the question at hand and to arm them to pursue further research either in the university library (e.g. students) or via the internet (e.g. most amateur astronomers). Third, and most importantly, the authors judiciously present both argument and counter-argument in the interpretation of the available evidence, thereby adding an essential element of debate - and even controversy - that successfully brings out the dynamism and excitement of the subject matter. In places, some RASC members may get lost when some of the more technical aspects of a topic are glossed over rapidly. However, such passages are necessarily short – due to the rapid-fire writing – and in any event readers will pick up the thread again very quickly as they read on.

I was particularly impressed with how up to date this book is. The subject of planetary geology has expanded so rapidly in the past few decades that it is commonly difficult for the average amateur astronomer to remain abreast of recent developments. An amateur astronomer with a long career as a professional geologist, I consider myself reasonably well versed in planetary geology. Yet as I read this text, I was continually thinking *“I knew that, but now I understand it”* or *“That’s news to me!”.* The former referred things like comparative cratering statistics as a chronological tool, or the causative factors of the Earth’s Chandler wobble. The latter to things, among others, as diverse as the potential impact of glaciation and sea level changes on planetary rotation parameters ; recent rationales for plate tectonics in early martian and venusian history (though personally I remain dubious) ; a suggestion that the magnetic field of Uranus may be in the process of flipping, and that Europa’s flips every 330 minutes! ; current thinking on why mare basalts occur preferentially on “our” side of the Moon ; the potential role of surface water in early venusian history ; the influence of atmospheric density on wind-induced erosion and sedimentation ; and, clear statements and interpretations regarding the most recent observations of both the nature of the surface of Mercury and global models for its crustal shortening (plus others too numerous to mention here). Subjects that may induce a similar reaction among RASC members might be as specific as the various factors that appear to determine the origins of major topographic features on Venus, and climatic consequences of the dramatic ”wobbliness” of martian precession, or as broad as the chapters on magnetic fields, topography/gravity, and atmospheres in their entirety.

Occasionally I found myself wondering why the authors did not address some of my favourite topics, such as the evidence of deltas and river channels for locating the shoreline of a possible northern ocean on Mars ; but then I remembered their explicit acknowledgement of their publishing constraints, and you can’t have everything.

Nothing - of course - is perfect, and I did indeed raise my eyebrows in a few places in the tectonics chapter, which is close to my own geological field (structural geology). My picky, specialist sensibilities aside, I would upbraid the authors for uncritically presenting the (highly equivocal) model of the Vallis Marineris as a strike-slip fault, and for – even tentatively – alluding to double ridges on ice moons (other than southern Enceladus, which they do *not* mention in this context) as potential analogues of terrestrial mid-ocean ridges (where then are the requisite high-angle transform faults – not to mention the belts of unequivocal crustal shortening?). That said, I appreciated their use of the conditional tense when presenting the dogmatic interpretation of penetratively lineated terrain on Ganymede as the product of extensional tectonics. However, let me emphasise, these picky comments on my part in no way detract from the overall quality of this book.

The final chapter on planetary biology is refreshingly informative and conservative. It avoids falling into the all too common modern trap of wishful thinking bordering on fantasy. The presentation is nonetheless stimulating and broad, ranging from life’s origins and extinctions to its potential influences on planetary processes.

To summarise : *“Planetary Geology”* is not a book for beginners, nor is it beside reading. However, it will make an excellent addition to the library of any amateur astronomer with an active interest in matters planetary and geological. I learned a lot from it : I think you will too.

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