About "Resources and Solutions"

for

Astrophysics Processes (AP)

Hale Bradt

(CUP 2008)

(www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521846561)

Resource – Relevant chapter or section of AP

Erratum: Sunyaev-Zeldovich effect – Section 9.5

Liouville's theorem – Section 3.3

Planck blackbody function – Chapter 6

Radiative transfer – Chapter 2

Saha equation – Section 4.2

Tidal_distortions: Earth tides and Roche lobes – Section 4.5

Material that supplements that in the textbook is posted on this site. Items may be downloaded without charge and distributed freely to others in this same format with the copyright notices intact.

The topics here are broadly relevant in astrophysics. They include topics possibly more advanced or complex than those in the text (Planck function, Liouville's theorem), those that are less difficult but which did not make it into the text (Saha equation and and tidal distortion), a topic (Radiative transfer) that is clearly an astrophysical "process", but which was published in my earlier text, *Astronomy Methods* (CUP 2004). Finally one significant erratum has been noted (Erratum: S-Z effect).

Except for the erratum, the goal is to provide a derivation from first principles of a fundamental process for the upper-level undergrad or beginning grad student. One may wonder why Liouville's theorem is included. It describes, in effect, the transport of photons through the cosmos which is the essence of astronomy and astrophysics. Hence its development seems basic to the our objective with this text, namely to get down to fundamentals.

Each of the derivations (except for the Saha equation) includes Problems for students to work out, usually with approximate (or exact) answers. Solutions are provided for instructors on the password-protected portion of this site.

As with the text, other texts and conversations with colleagues have been helpful; acknowledgments are in the individual documents. Prof. Stanislaw Olbert of MIT joined me in preparing the Liouville and Planck presentations.

I welcome comments from readers.

Hale Bradt

bradt@mit.edu

Salem MA, August 2009.