Utrecht Radiative Transfer Courses

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The Utrecht course *"The Generation and Transport of Radiation"* teaches basic radiative transfer to second-year students. It is a much-expanded version of the first chapter of Rybicki & Lightman's *"Radiative Processes in Astrophysics"*. After this course, students understand why intensity is measured per steradian, have an Eddington-Barbier feel for optically thick line formation, and know that scattering upsets LTE. The text is a computer-aided translation by Ruth Peterson of my 1992 Dutch-language course. My aim is to rewrite this course in non-computer English and make it web-available at some time. In the meantime, copies of the Peterson translation are made yearly at Uppsala – ask them, not me. Eventually it should become a textbook.

The Utrecht course *"Radiative Transfer in Stellar Atmospheres"* is a 30-hour course for third-year students. It treats NLTE line formation in plane-parallel stellar atmospheres at a level intermediate between the books by Novotny and Boehm-Vitense, and Mihalas' *"Stellar Atmospheres"*. After this course, students appreciate that epsilon is small, that radiation can heat or cool, and that computers have changed the field. This course is web-available since 1995 and is regularly improved – but remains incomplete. Eventually it should become a textbook.

The three Utrecht exercise sets *"Stellar Spectra A: Basic Line Formation"*, *"Stellar Spectra B: LTE Line Formation"*, and *"Stellar Spectra C: NLTE Line Formation"* are IDL-based computer exercises for first-year, second-year, and third-year students, respectively. They treat spectral classification, Saha-Boltzmann population statistics, the curve of growth, the FAL-C solar atmosphere model, the role of H-minus in the solar continuum, LTE formation of Fraunhofer lines, inversion tactics, the Feautrier method, classical lambda iteration, and ALI computation. The first two sets are web-available since 1998; the third will follow.

Acknowledgement. Both courses owe much to previous Utrecht courses taught by the late Kees Zwaan. The third exercise set was developed by Phil Judge, Mandy Hagenaar, and Thijs Krijger.

Reverse acknowledgement. If you are a user of this free material you might refer to this summary and so boost my citation standing. Corrections are also welcome.