Introduction to Physics of Stars
Bonus problem (September 21st 2009)

Imagine thin and flexible surface permanent magnet (a plate with north magnetic pole on one surface and south magnetic pole on the opposite surface). Assume that we can easily deform the magnet without reaching Curie temperature. Also assume that the magnet is weak enough to allow us to put two identical poles together with small effort. Our lab is also equipped with state-of-the-art device that is able to join edges of two pieces of this magnet on atomic level without disturbing magnetic domains around the junction. Therefore, assume that it is technically possible to build-up large and monolithic surface magnet from small pieces. All magnetic dipoles in our material are perfectly stable, homogeneously distributed and they are always oriented perpendicular to the surface.

Now imagine that we use this material and technology to create enclosed hollow sphere with one magnetic pole on the inner surface and the other on the outer surface. Try to describe magnetic field of such object.

To achieve a grade it is necessary to submit the solution till October 5th, 6pm (exactly) to the office (06) 03041, or send it by e-mail to the address of T.A. (gszasz@physics.muni.cz).

Solution will be shown, together with the assignment of the next bonus problem, on the Web page: http://astro.physics.muni.cz/study/courses/f3080/ , on October 5th at 6pm.