HAO Colloquium Series

Speaker: Paul Charbonneau

Time: 10:30–11:30 am—(Note time change for this colloquium only!!)

Date: Wednesday, July 16, 2014

Location: CG1 – 2126 (also webcast at http://www.fin.ucar.edu/it/mms/cg-live.htm)

Title: Double cycles and instabilities in global MHD simulations of solar convection

Abstract:

The last major research project I began while at HAO consisted in developing global magnetohydrodynamical simulations of solar convection, in collaboration with Piotr Smolarkiewicz, then at MMM/NCAR. The idea was to extend his powerful EULAG hydrodynamical simulation code to MHD, taking advantage of the low dissipative properties of its advection algorithm. The project finally came to fruition about 5 years ago, with the production of large-scale magnetic fields undergoing regular polarity reversals in a manner solar-like in many respects.

In this talk I will first present the current status of our solar cycle modelling efforts based on EULAG-MHD, with emphasis on a recent 1600-yr long "millennium simulation". I will then focus on two ongoing research projects associated with these simulations (read: my graduate students are doing the real work), namely the existence of dual dynamo cycles, and of the possible development of MHD instabilities in the stably stratified layers underlying the convecting layers in the simulation.