

# GTP Visit Description: Marc Brachet

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*Geophysical Turbulence Program – 2007 NAR*

*Annick Pouquet (NCAR) Duane Rosenberg (NCAR), and Pablo D. Mininni (NCAR)*

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Dr. Brachet’s visit ends in FY2008; however, it has already seen significant progress on several research fronts through collaboration with several members of the [Turbulence Numerics Team](#). He has collaborated with Dr. Annick Pouquet, GTP Director, on the extension of the of the recently discovered quasi-dissipative behavior of the truncated Euler equations to the kinetic helical and MHD cases. In addition, in collaboration with Drs. Pablo Mininni, Duane Rosenberg and Annick Pouquet, he has developed a low-storage third- and fourth-order accurate Runge–Kutta algorithm to replace an erroneous algorithm often cited in the literature.

Dr. Brachet, in collaboration with Drs. Mininni and Rosenberg has also developed a parallel version of a symmetric FFT algorithm for use in pseudo-spectral studies of problems that have the same symmetries as the so-called Taylor–Green vortices.

Finally, together with Dr. Pouquet, Dr. Brachet has been studying the generalization to the MHD problem of the Eulerian-Lagrangian formulation of the Navier-Stokes equations in terms of Weber-Clebsch variables. This effort will lead to an application of these new formulations to the study of magnetic reconnection and dynamo.