PI: Peter H. Yoon

As a result of support from DOE, I have published 10 journal articles. These are

- [1] P. H. Yoon, Generalized weak turbulence theory, Phys. Plasmas, 7, 4858 (2000)**
- [2] P. H. Yoon, L. F. Ziebell, and C. S. Wu, Excitation of Langmuir waves in interplanetary space, J. Geophys. Res., 105, 27369 (2000)**
- [3] L. F. Ziebell, P. H. Yoon, and C. S. Wu, Maser-beam instability of Bernstein waves, Phys. Plasmas, 7, 4720 (2000)**
- [4] L. F. Ziebell, R. Gaelzer, and P. H. Yoon, Nonlinear development of weak beam-plasma instability, Phys. Plasmas, 8, 3982 (2001)**
- [5] P. H. Yoon and R. Gaelzer, Nonlinear frequency shifts of plasma eigemodes, Phys. Plasmas, 9, 4166 (2002)**
- [6] P. H. Yoon and R. Gaelzer, Effects of nonlinear frequency shifts on certain induced scattering processes, Phys. Plasmas, 9, 4520 (2002)**
- [7] R. Gaelzer, L. F. Ziebell, and P. H. Yoon, Generation of harmonic Langmuir mode by beam-plasma instability, Phys. Plasmas, 9, 96 (2002)**
- [8] P. H. Yoon, R. Gaelzer, T. Umeda, Y. Omura, and H. Matsumoto, Harmonic Langmuir waves. I. Nonlinear dispersion relation, Phys. Plasmas, 10, 364 (2003)**
- [9] R. Gaelzer, P. H. Yoon, T. Umeda, Y. Omura, and H. Matsumoto, Harmonic Langmuir waves. II. Turbulence spectrum, Phys. Plasmas, 10, 373 (2003)**
- [10] T. Umeda, Y. Omura, R. Gaelzer, P. H. Yoon, and H. Matsumoto, Harmonic Langmuir waves. III. Vlasov simulation, Phys. Plasmas, 10, 382 (2003)**

The major thrust of the research supported by DOE was to develop a fundamental theory of plasma turbulence from first principle, and to apply the formalism on the well-known beam-plasma interaction and Langmuir turbulence problem. Plasma turbulence may be a key process responsible for the as yet not fully understood charged particle acceleration and turbulent transport.

The plasma turbulence theory was developed by the former Soviet scientists starting

from the 1960s throughou the 1980s, but since then the activity largely subsided. I have picked up where the earlier pioneers left off and extended the plasma turbulence.