Michigan Institute for Plasma Science and Engineering Seminar

High-Resolution and Adaptive Methods for Plasma Physics

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Room 1005 EECS Building
Joint Seminar with AOSS and NERS

Abstract

In this talk, we will describe a collection of methods developed over the last few years for using ideas from computational fluid dynamics to numerical simulations of plasmas. These include new methods for fluid models of plasmas, corresponding to the methods used very successfully for low-Mach number fluid flows; high-order finite-volume methods for gyrokinetic models of tokamak plasmas; and remapping methods for eliminating noise in PIC simulations.

About the Speaker: **Dr. Phillip Colella received his A.B. (1974), M.A. (1976) and Ph.D. (1979) degrees from the University of California at Berkeley, all in applied mathematics. He is currently a Senior Staff Scientist and Group Leader for the Applied Numerical Algorithms Group in the Computing Sciences Directorate at the Lawrence Berkeley National Laboratory. His research has been in the area of high-resolution and adaptive methods for partial differential equations. He has also applied numerical methods in a variety of scientific and engineering fields, including shock dynamics, low-Mach number and incompressible flows, combustion, porous media flows, and astrophysical flows. Honors and awards include the IEEE Sidney Fernbach Award for high-performance computing in 1998, the SIAM/ACM prize (with John Bell) for computational science and engineering in 2003, and election to the US National Academy of Sciences in 2004.**