PRINCETON UNIVERSITY
APPLIED MATH COLLOQUIUM
Peyton Hall Auditorium
FRIDAY, MAY 29, 1981 2:30 p.m.

SPAKER:

PHILIP J. MORRISON
Plasma Physics Lab

TOPIC:

"Hidden Hamiltonian Structure
in Classical Field Equations —
Applications from fluid Mechanics
and Plasma Physics"

If I could just come up with a
clever idea, I'd draw the most
terrific cartoon!

Philip Morrison's names have no rhyme
Though I looked for an awfully long time
If I'd found even one
I'd have surely begun
On a limerick simply sublime!

Abstract: Canonical transformations
preserve the form of Hamilton's
equations; other transformations
obscure this form. Since the
physical variables of a dynamical
system may not be canonical, it is
important to know the conditions
necessary to obtain Hamilton's
equations. We will discuss the
connection between Hamilton's
equations and the Lie Algebraic
properties of the Poisson bracket.
This connection will be extended
to field equations. Poisson
brackets, in terms of the
usually encountered physical
variables, will be presented
for the equations which describe
a perfect fluid (including the
magnetic body force) and the
Maxwell-Vlasov equations.

Refreshments Afterwards
Everyone Welcome