PRINCETON UNIVERSITY

APPLIED MATH COLLOQUIUM

Peyton Hall Auditorium

FRIDAY, MAY 29, 1981 2:30 p.m.

SPEAKER:

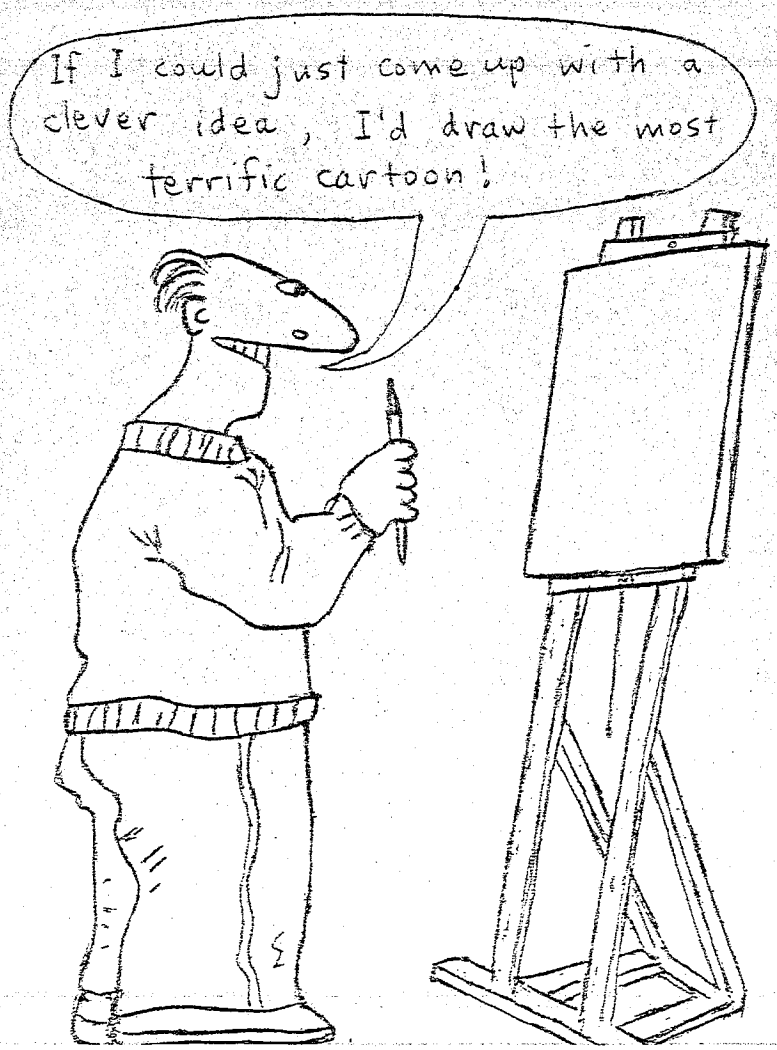
PHILIP J. MORRISON

Plasma Physics Lab

TOPIC:

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

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

M.M.

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