

**Session Ai - Vortex Dynamics.**

*ORAL session, Sunday, November 23*

*309, Moscone Center*

**[Ai.01] Solitons and 2 D Vortex Dynamics**

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In inviscid, steady, two dimensional flows without body force, one general solution of the equations of motion is  $\omega = f(\psi)$ , where  $\omega$  = vorticity,  $\psi$  = stream function,  $f$  = a differentiable but otherwise arbitrary function. Recent advances in the theory of solitons and nonlinear waves will be employed to obtain new solutions in vortex dynamics. More precisely, the sine - Gordon and the sinh - Poisson equations will be treated. Known solutions in the literature can be re-derived. Both localized solitons and periodic waves will be utilized. New solutions include for example a doubly periodic array of vortices and a vortex in a box. The new concept of a 'positon' will also be examined.

**Part A of program listing**