*896-51-94 **Robert A. Liebler**, Colorado State University, Fort Collins Colorado 80524. *On Finite Flag Transitive Projective Planes.* Preliminary report.

Results of Kantor (1987) and Feit (1990) imply that a finite projective plane of order n that admits a collineation group G acting sharply transitively on the incident point, line pairs is either Desarguesian (and $n = 2, 8$) or $n > 14(10)^6$. A new plane of this type would have non prime power order and possess a cyclic perfect difference set with numerical multiplier of maximal possible size. This talk will describe recent progress to remove the numerical restriction and show nonexistence by means a nonsymmetric commutative association scheme and its arithmetic representations. (Received July 21, 1994)

52 ▶ Convex Sets and Related Geometric Topics

*896-52-102 A.R. Calderbank, AT&T Bell Laboratories, Murray Hill, NJ 07974.
Codes over the integers modulo 4 and exponential sums.

We report on recent results obtained in collaboration with Kumar (Univ. S. California) and Helleseth (Univ. Bergen, Norway) and with McGuire (Caltech). These results connect linear codes defined over the integers modulo 4 and exponential sums involving Galois rings. (Received July 28, 1994)

*896-52-103 J.H. Conway, Princeton University, Princeton, NJ 08544 and N.J.A. Sloane, AT&T Bell Laboratories, Murray Hill, NJ 07974.
The antipode construction for sphere packings.

A construction for sphere packings is introduced that is parallel to the "anticode" construction for codes. This provides a simple way to view Alexander Vardy's remarkable new 20-dimensional sphere packing, and also produces packings in dimensions 22, 44-47 that are denser than any previously known. (Received July 28, 1994)

54 ▶ General Topology

896-54-14 Robert E. Buck, Slippery Rock University, Slippery Rock, PA 16057.
Some Weaker Monotone Separation and local basis properties.

Ito showed that stratifiable spaces in which there is a closure preserving local base at each point are M_1. That local version of M_1 is called m_1, while m_2 and m_3 are analogously defined. We look at some of the properties of these spaces. Monotone normality can also be generalized to monotonically T_2: There is a function g assigning to each ordered pair (x, y) of distinct points in X a neighborhood, $g(x, y)$, of x such that $g(x, y) \cap g(y, x) = \phi$ and $x \in \cup\{g(x, y) \mid y \in M\} \Rightarrow x \in \overline{M}$. The monotone T_2 property has some advantages over monotone normality. We show, for example, that it is preserved under arbitrary box products. We also examine weaker analogues of acyclic and strong monotone normality. There is a strong relationship between the m_i-spaces and the monotone T_2 property, and in some circumstances they are equivalent. (Received June 27, 1994)

*896-54-134 **Alan Dow**, York University, North York, Ontario, Canada M3J 1P3, and **J. Donald Monk**, University of Colorado, Boulder, Colorado 80309. *Compact scattered spaces, tightness, depth, and π-character..*

The depth of a Boolean algebra (Stone space) is the supremum of the lengths well-ordered chains (of clopen subsets). We discuss the relationship between depth and π-character and between depth and tightness. Specifically how large can we make the tightness or π-character while keeping the depth small? In general, there is no bound – the Cantor cube 2^κ has countable depth. We report on the relationships in the class of compact scattered spaces (dually superatomic Boolean algebras). (Received August 2, 1994)