1033-52-59 **David Forge**, LRI, Université Paris-Sud, Orsay, France, and **Thomas Zaslavsky***
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On the division of space by topological hyperplanes.

A topological hyperplane (a 'topoplane') is a subspace H of R^d which is topologically like a true hyperplane. An arrangement of topoplanes is a finite set $\mathcal{A}$ of topoplanes such that, for each pair H, H' that intersect, $H \cap H'$ is a topoplane in H and in H' and similarly for more than two topoplanes. Intersecting topoplanes may cross or not. Main examples: An arrangement of affine hyperplanes or pseudohyperplanes (representing an affine oriented matroid); here, intersecting topoplanes always cross.

Topoplane arrangements are essentially more general than pseudohyperplane arrangements, in several ways. Given some nice property, we may ask whether every $\mathcal{A}$ can be 'rearranged' into an $\mathcal{A}'$ such that $\bigcup \mathcal{A} = \bigcup \mathcal{A}'$ (that is, they have the same regions) and $\mathcal{A}'$ has the nice property. For instance, consider the property that every intersecting pair of topoplanes crosses. Then the answer is: Yes in the plane, no in higher dimensions, but yes in all dimensions if there are no multiple intersections. (Received August 31, 2007)