1067-P1-1644   **Mary J. Riegel*** (`riegelmj@mso.umt.edu`), 410 N Surrey, Missoula, MT 59808. *"Fire and Ice"*. "Fire and Ice" is a variation on the classic game of Tic-Tac-Toe. Unlike Tic-Tac-Toe however, it is impossible for the game to end in a draw. The game was designed by Jens-Peter Schliemann and is produced by Pin International. The game board exploits the symmetries of the finite projective plane $PG(2,2)$, also known as the Fano Plane. The board is divided into seven islands, each containing seven points, arranged in the shape of $PG(2,2)$. Players attempt to control the board by possessing three islands in a line. Rather than placing a piece in an open position, a player moves one of his pieces to an allowed position, and then replaces the piece with an opponent's.

In this talk, we will explore several key properties of the board, which among other things prevent a draw. We will also discuss variations on the game by considering different geometries that share (or do not share) these properties. We will explore implications of the play mechanism, including an interesting consequence when used on a standard 3×3 board. We will calculate the game value for "Fire and Ice" as well as the game value for other boards, including describing situations in which Fire wins playing first. Finally, we will discuss various strategies for play. (Received September 21, 2010)