

MAT 566: Differential Topology Fall 2006

Presentation 4: Exotic Differentiable Structures on S^7 (after the Signature Theorem)

You will need to thoroughly cover Sections 1-3 of Milnor's famous paper, including the following (and not necessarily in this order):

- (1) an invariant of 7-manifolds (that bound);
- (2) quaternions, $SO(4)$, and S^3 -bundles over S^4 ;
- (3) computation of p_1 of such manifolds;
- (4) gradient flow and a characterization of S^n , with examples.

On the other hand, do not cover what is not directly relevant to the main objective, e.g. it is not too important what π_3 and Ω_7 are.