Possible Topics for Math 868 Seminars

This is a list of *possible* topics for seminar talks. You are encouraged to find others on your own. These topics are not listed in any special order. After the first several weeks of class you will have enough background for most of these topics.

Real and complex projective spaces	Lee pages 7, 20, 29.
The Grassmann manifold	Lee pages 22-24.
Manifolds with boundary	Lee pgs 25-27, Guillemin & Pollack §2.1.
Proof of the Inverse Function Theorem	Lee pgs 159-162, W. Rudin *Principles of Real Analysis*.
The Whitney embedding theorem	Lee pgs 246-251, Guillemin & Pollack §1.8.
Quaternions and the Hopf map	Lee pg 203 and Exercise 9-22 pg 240.
Finite group actions and Lens spaces	Hatcher, *Algebraic Topology* pgs 70-75, 144-5 (online).
Sard's Theorem	Lee pgs 242-246, Guillemin & Pollack Appendix.
The Morse Lemma	Guillemin & Pollack §2.7, J. Milnor *Morse Theory*.
Lie groups	Lee pgs 37-39 and 194-197.
Lie algebras	Lee pgs 93-100 and 197-199.
Transversality	Guillemin & Pollack §2.3.
Symplectic manifolds	Lee pgs 314-319.
The Darboux Theorem	Lee pgs 481-484.
Hamiltonian flows	Lee pgs 484-490.
The Cartan Formula $\mathcal{L}_X = d\iota_X + \iota_X d$	Lee pgs 473-477.
Cauchy Integral Formula via forms	Guillemin & Pollack pgs 192-3.