# SUPERSYMMETRY FOR BEGINNERS

I. **Introduction:**

II. **WESS ZUMINO MODEL**
- A.) The Action & SYMMETRY OPERATIONS (Ryder's 2nd Ed.)
- B.) Auxillary Fields close the algebra
- C.) Algebra of SUSY charges $Q$

III. **N=1 RIGID SUPERSPACE**
- A.) POINCAIRE $\longrightarrow$ SUPER POINCAIRE
- B.) General SUSY; what $N=1$ means.
- C.) Grassman variables
- D.) $N=1$ RIGID SUPERSPACE defined
- E.) SUSY Generators realization as Diff. Operators on Superspace.
- F.) COVARIANT DERIVATIVES $D_\alpha$ & $\bar{D}_{\dot{\alpha}}$

(Wess & Bagger OR Lykken)

IV. **SUPERFIELDS**
- A.) Scalar Superfield (Unconstrained)
- B.) Components & how they mix under susy.
- C.) Chiral Superfields
- D.) Vector Superfields
- E.) Supergauge Transformations of Vector S.F.
- F.) Spinor Superfield; the field strength multiplet.
- G.) Supergauge Transformations of Spinor S.F.
- H.) Non-Abelian generalization.

(Wess & Bagger OR Lykken)

V. **SUPERSYMMETRIC ACTIONS**
- A.) BEREZIN INTEGRATION: $d\Theta, d\bar{\Theta}, d\Theta d\bar{\Theta}$.
- B.) CHIRAL ACTIONS: WESS ZUMINO rediscovered
- C.) PURE GAUGE ACTIONS
- D.) HOW TO GAUGE THE CHIRAL ACTION ($\partial_\mu \longrightarrow D_\mu$)
- E.) Review of the Standard Model's field content.
- F.) MINIMAL SUPERSYMMETRIC STANDARD MODEL (MSSM)
- G.) SUSY Breaking & Experimental Detection, when & how.

VI. **CONCLUSION: WHAT WE HAVE NOT DONE...**