

- i.) *Basic Ideas*
 - a.) Near Equilibrium
 - 1.) Phase Transition Theory
 - 2.) Plasma Fluctuations
 - 3.) Mean Field Theory → Lenard-Balescu Equation
 - b.) Strongly Excited Self-Similar Systems
 - 1.) Scale: 3D Hydro Turbulence: Dissipation, Karman-Howarth Theorem, 4/5 Law, K41, β -model of Intermittency
 - 2.) Scale: Colloidal Aggregation, Ballistic Agglomeration, 2D Fluids, Dual Cascade ↔ Conservation Constraints, Non-local effects
 - 3.) Space: Spreading of the Turbulent Spot or Blob; Loitsyansky Integral Spin-Down and Spreading, Macro-Evolution
 - 4.) Pipe Flow Turbulence: Spatial Mixing, Mixing Length Theory, Law of the Wall, Vorticity Dynamics, Beyond Prandtl

- ii.) *Transport Mean Field Theory*
 - a.) Review of Quasilinear Theory and its Limitations: Spectral Autocorrelation, Kubo number, Origin of Irreversibility, Relation to Fokker-Planck Theory, Energetics
 - b.) Off-Diagonal Quasilinear Fluxes: Pinch, Residual Stress, Relation to Wave Transport
 - c.) Heat Transport in Stochastic Fields: Kinetic, Fluid
 - d.) Percolative Transport, Taylor problem

- iii.) *Transport – Beyond Mean Field Theory*
 - a.) Foundations of Fokker-Planck Theory
 - b.) Fokker-Planck → Levy Flights, Fractional Kinetics, Transport Anomalies
 - c.) Sandpile Model of Self-Organized Criticality, Burgers Model of Avalanching
 - d.) From Diffusion Eqn. → Telegraph Eqn., Traffic Analogies
 - e.) Non-local Flux Models, Non-locality Phenomena in Tokamaks

- iv.) *Secondary Modes and Feedback: Quasi-Particles and Envelopes*
 - a.) Prototype of Non-Local Interaction: Langmuir Turbulence via Wave Kinetics and Envelope Theory
 - b.) Zonal Flows, Anisotropy, Inhomogeneous PV Mixing
 - c.) Charney-Drazin Momentum Theorems
 - d.) Scales, Structures, Staircases
 - e.) Kinetics and Envelope Theory of Drift Wave – Zonal Flow Turbulence

- v.) *OV of Perturbative Models of Wave-Particle and Wave-Wave Interaction*
 - a.) Higher Order Wave-Particle Interaction
 - b.) Resonance Broadening Theory and Renormalized Kinetics
 - c.) Wave-Wave Interactions
 - d.) Non-Local Interactions in Scale
 - e.) Breaking

- vi.) *Mesoscale Dynamics*
 - a.) Reduced Models on Mesoscales
 - b.) Shear Flow Feedback, Transport Bifurcations, Profile Formation
 - c.) 1st and 2nd Order Transition Fronts: Fisher and Fitzhugh-Nagumo and Their Plasma Counterparts
 - d.) Transport Bifurcations and Non-locality Phenomena

- vii.) *Phase Space Turbulence*
 - a.) Basics Ideas of Vlasov Turbulence
 - b.) Coherent and Stochastic Phase Space Structures
 - c.) Statistical Theory of Granulations
 - d.) Granulations in Drift Wave Turbulence
 - e.) Coupling to Zonal Modes
 - f.) Subcritical Growth

- viii.) *Theory Meets Some Tokamak Phenomena*
 - a.) L \rightarrow H Transition
 - b.) ELM
 - c.) Intrinsic Rotation
 - g.) Non-local Transport
 - h.) Density Pinch