COMPLEXITY SCIENCE AND SYNERGETICS SUMMARY				
Description	**Creation**	**Organisation**	**Interaction**	**Other**
Entropy: maximal Hamiltonian (total energy) of an a priori (from theory) phase space distribution minus logarithm of number of phase space up to constant coefficient of Boltzmann's constant	*Computational Complexity:* minimal number of computational resources (time and memory) to solve a given class of problem taken up to constant	*Metric Entropy*: asymptotic limit on entropy of the intersection of a measurable partition with all n endomorphisms (metric isomorphisms) of itself divided by the number of endomorphisms.	*Conditional Information*: amount of information a message reveals about something given someone who already knows something else	*Long Range Order:* remote samples exhibit correlated behaviour. Contrast with quenched (supercool) disorder that is complex with rapid evolution in time. Annealed (slow cool) disorder has evolution in time.
Fisher Information: expected value of observed information. Inverse of Fisher information is lower bound of variance of unbiased estimator of unknown parameter	*Thermodynamic Depth:* relation between entropy of a system to the number of historical paths that led it to observed state.	*Topological epsilon machine size* number of states of a unique minimal representation of stationary stochastic processes whose states are equivalence classes of infinite histories with the same probability distribution over all futures	*Partition function:* sum of all exponents damped with product of total energy and inverse temperature over all possible partitions of the systems into different energy state	*Asymptotic equipartition property:* the typical outcome is part of a large set of outcomes with equal probability despite certain individual outcomes having higher probability than those in this set.
Chernoff Information: symmetric measure of dissimilarity between two probability measures/upper bound of probability of error of misclassification from Bayesian hypothesis testing	*Crypticity:* measure the difference in a process's hidden state and observed information	*True Measure Complexity:* amount of information contained in given part of a sequence to predict the next symbol.	*Temperature:* the higher the temperature, the lower the potential for interactions to order the systems since all states are closer towards uniform probability.	*Critical Point*: point with all derivatives of free energy becomes infinite
Code Length (prefix-free, Huffman, Shannon-Fano, error-correcting, Hamming): number of symbols assigned to a message for various objectives to reduce noise	*Information-Based Complexity:* measure of intrinsic difficulty of problem given partial information.	*Effective measure complexity* measures the relative information required to calculate the probability of the next symbol of the sequence	*Conditional Algorithmic Information Content*: information in symbols given by length of shortest computer program given existing computer programs	*Renormalisation group:* behaviour of system is aggregate of ensemble of subsystems defined at a critical point, which itself behaves as an ensemble of critical sub-sub systems and so forth.
Chaoticity: states of perturbed system have minimal overlap with unperturbed systems.	*Cost (of energy, money):* amount of resources of next best opportunity forgone to create something	*Schema Length:* total number of nodes in a subset of strings with similarity at certain string position.	*Hierarchical Complexity:* difference from decomposability to simple behaviour.	*Complex Adaptive Systems*: self-similar collective of interacting adaptive agents
Rényi divergence: $D_\alpha(P\|\|Q) = \frac{1}{\alpha-1}\log\left(\frac{\sum p^\alpha}{q^{\alpha-1}}\right) > 0$ except at equal distributions.	*Logical Depth:* time of shortest program to generate string or pattern.	*Grammatical Complexity:* level of type of grammar with certain language class, automaton interpretability, and rule forms (Chomsky)	*Percolation model:* at criticality, small, disconnected clusters becoming significantly large well-connected clusters when nodes and links are added.	
Fractal Dimension: limit of the logarithmic number of intervals at a n-th stage construction divided by the logarithmic magnification	*Computational irreducibility:* computations that cannot be sped up by any shortcut algorithmically	*Sophistication:* measures in bits the structural algorithmic information of a string, the minimum complexity is the best model for a string.		
Lempel-Ziv Complexity: least possible steps a sequence can be generated via the number and length of repeated sections		*Excess entropy:* measures how much more information one must know to determine the actual uncertainty		
Dimension: number of independent points needed to define a point on it.				