

SCIENCES THEMES	ASTRONOMY	PHYSICS	CHEMISTRY	GEOLOGY	BIOLOGY	COMP SCI	MATH/STA
HIERARCHICAL SCALES OF SIZE	galaxies; stars; planets; moons; ast.; clusters	families of subatomic particles; atomic str	elements; compounds; polymers; multimers	geologic time hier; landsat to crystallog. hierarchy	organelles; cells; tiss. org.; org's; ecosystems	stepwise refinement; subprogram; sys. str.;	log scales; metrics; nested equations
MODELING REALITY: CAUSES & CHAOS	chaos in planet orbits	turbulence in flows; chaos in snowflakes & faucets		chaos in weather sys	chaos in muscle & heart-beats	how the comp helps us "see" chaos	universal quantities in chaos
SYSTEM DYNAMICS & BOUNDS	gravity as action at a distance;			effects of asteroids on planets; greenhouse effects	membranes of cells; the skin; eco-ranges; interactions	computer networking;	concepts of limits; fcn's as interaction
SELF-ORGZ ORIGINS & EMERGENCE	origins of the solar system; starbirth; cos heterogeneity		coacervates; hypercycles	volcanic isles mech.'s of orogeny;	autocatalysis of organelles; new species; macroevol;	artificial life games; pattern recognition;	
REGULATORY MECH AND FEEDBACKS	stellar feedbacks;	nuclear fission rxns;	end-product inhibition;	Gaia & bio feedbacks to geo;	hormones; embryology; eco food web	program control statements;	computation explosion;
STABILITY & EQUILIBRIUM	Hertzprung-Russell diag; stellar stabilities;	thermodynamic equilib; phys. stasis	balancing rxn equations;		dynamic equilibrium MTS; homeostasis equilib. in ecosystems;		math. of dynamic equilibrium;
CYCLES & OSCILLATIONS	galactic life cycle; stellar life cycle; oscillating cosmos	states of matter;	transitions, phase diagrams;	crustal re-cycling; biogeochemical; ice-age cycl.;	organism life cycles; species, eco sys life cycl	recursion loops in prog;	math. of oscillations;
DUALITY, SYMMET. GROUP TH.	binary stars; matter vs. anti-matter; asymmetry;	opposite spins; wave-particle dual.	optical activity; + and - charges; ana-catabolic rxns;	dual forces in storms; crystal form symmetries;	complementarity in dna; gene info transfer; bilateral syn; neuropeptides	duality in programming	group theor. duality in algebraic sets; geom. & Poncelet.
LIMITS, CONSERV. ON FLOWS	universal constants; anthropic principles	physical limits; entropy laws;	chemical information		biopolymers as info;	history of information theory; limits of computing	math of info theory;
INTERACT NETS & FIELD TH.	gravitational fields;		types & basis of chemical reactions;	multiple effects of CFCs	ecosystem structure; dev'tal gradients;		
FORM, PROPORTION & CHANGE	closed or open univ.?	engineering allometry;			biological allometry; neural nets;		discovery of the calculus;
MECH OF VARIETY AND EVOLUTION			chem competition & selection;	punctuated equilibrium; Burgess shale	discovery of evolution;	genetic computing algorithms;	how chance generates variety;