

HDS complex systems design science

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SUMMARY

Writing and fundamental research on scientific methods for understanding change in natural systems, as a common foundation for the sciences through their common subject; sustainability research and design services.

EDUCATION

1964-68 B.S. PHYSICS & MATH: *Al Rhomer Don Peckham dept. heads, St. Lawrence University, projects in how experiments misbehave, minors in economics, fine art, athletics*

1968 GRADUATE STUDY: *Stony Brook U. - Gödel's Incompleteness theorem*

1969-70 GRADUATE STUDY: *Columbia U. - Topology; Architectural Design*

1971-73 Masters in Architecture & Environmental Design:

University of Pa GSFA, main influence: school luminaries Lou Kahn & Ian McHarg, structural design Prof. Peter McCleary; Sustainable Design thesis, Minor concentration in Landscape w/ thesis on micro climates.

HONORS

1973 – MEDAL FOR BUILDING TECHNOLOGY

Univ Pa. School of Architecture –class award, for innovative inquiry and experiment in building structure and environmental systems

2009 – BEST ENERGY PAPER OF THE YEAR

American Society of Mechanical Engineers – for a combined “top-down” and “bottom-up” method of “energy accounting (paper 2010-2)

INDEPENDENT STUDY

FIELD RESEARCH: MICRO CLIMATE EVOLUTION 1976-79

Field documentation of passive energy transport in several houses in South West using a mobile climate lab for detailed 24 hr records and careful study of naturally evolving air current forms and pathways

APPROPRIATE TECHNOLOGY:

• **SOLAR BUILDING SYSTEMS AND PUBLICATION**

Papers of 1977, 78 and articles in Rain Magazine, journal of appropriate technology, on systems approach to design with climate.

• **BIOMIMICRY: MIMICING EMERGENT NATURAL SYSTEMS 1978-79**

Design of solar collector using self-organizing convection to delay the onset of turbulence separation of hot air currents & principles to apply.

SYSTEMS SCIENCE: “UNHIDDEN PATTERN OF EVENTS” 1979--

An observation on natural whole systems (paper 1979-1), a general scientific theory and method of investigating the life cycles of naturally occurring systems, to identify, retrace and reconstruct their developmental narratives with the physics of energy use continuity to find and fill in the blanks.

ECONOMICS: NATURAL ECONOMIC WHOLE SYSTEMS 1983--

Economic growth systems and their natural limits: General Allocation Theory (paper 1983-1) limits of money for managing accumulative investments in physical market systems, a framework for physics theorems relating natural limits to resource and adaptive learning costs to environmental signals.

ANALYSIS: DERIVATIVE RECONSTRUCTION 1989--

Mathematical methods for reconstructing records of systemic change and defining markers for the mechanisms involved. Development of a software platform for use in studying of developmental processes. (paper 1999-1)

PHYSICS: A LAWS OF CONTINUITY 1992--

Theory underlying observed continuity of developmental processes, derived from the conservation of energy, identifying the specific forms and succession of complex self-organization processes to start or complete complex system energy uses. (paper 1995 - 1)

PALEONTOLOGY: PUNCTUATED EQUILIBRIUM 1994 - 2007

Mathematical tests to separate continuity and noise in time series records, to identify organized processes in the evolutionary transition from a simple to a complex form of plankton, finding repeated emergent systems and their collapse, as driving a punctuated evolutionary change. (paper 2007-1)

CRIMINOLOGY: NATURAL SOCIAL SYSTEM COLLAPSE 2005-6

Study of the very distinct collapse of New York's high crime drug cultures beginning in 1990, finding what became fragile, and what appeared to broke it.

CULTURAL SYSTEMS: CELLS OF CHANGING WORD USE 2008--

Using historical records of word use from sources like the NY Times and Google, developed methods for identifying emergent systemic change in culture and human perception of emergent change in our economic environment, often of very separate tracks..

SUSTAINABILITY: (a.k.a. "APPROPRIATE TECHNOLOGY")

• SYSTEMIC MEASURES & INDICATORS 2005--

Developed various whole system metrics for accurate reading of environmental signals, exposing major errors in the units of measure being used for sustainability (papers 2010-1, 2011-1, 2, 3 and 2012-1)

• "ACTION LEARNING" FOR ENVIRONMENTAL INTERVENTION 2005--

*- A "4D sustainability method for developing design intent engaging the environment, for "working with nature",
- Studied partnership methods for environmental learning & problem solving
- Application to "the Commons Approach" as a community based method of working with nature and developing "Sustainable Development Goals"*

• BARRIERS BETWEEN KNOWLEDGE SYSTEMS 2008--2014

*- Watching the emergence of new knowledge systems, with an ever more constant focus on the cellular organization as "silos" making communication seem incompatible, while people frequently switch from the view of one to another they know too.
- Studying the relation between mental models and perceptions of systems organized and behaving from the inside vs. interacting in their environments of external forces.
- Consciousness as a static biological "reference universe" lacking a process view of the natural world*

• A "PATTERN LANGUAGE" FOR NATURAL DESIGN PATTERNS 2015

- research on Alexander's pattern design language, and its adaption for communicating natural patterns of design, papers for 2015 PURPLSOC & PLoP meetings. See [PLref directory](#) & related writings in [Reading Nature's Signals](#)

PUBLICATIONS

2015-2 *Guiding Patterns of Natural Design - Mining Living Quality. PLoP*

2015-1 *Guiding Patterns Of Natural Design: Principle Elements. PURPLSOC
(2015 drafts in [PLref directory](#))*

2014 *A [World SDG](#) - proposed information system to enable a world to respond to the common interest, and make a good home on earth.*

- 2013** [Proposed Post2015 Commons approach for the UN](#) – co-author, with Commons Action for the UN
- 2012** [Shining Light on “Dark Energy”: Measuring the total impacts of Business](#)- In "SB New Metrics of Sustainability", on SEA method implication
- 2011-3** [A decisive moment for Investing in Sustainability](#) as we hit the resource limits of the earth, Apr New European Economy
- 2011-2** [The curious use of Stimulus for Constraint](#) - promoting growth to prevent resource depletion - in revisions for pending issue of E:CO
- 2011-1** [System Energy Assessment \(SEA\), Defining EROI for Energy Businesses as Whole Systems](#), in Special Issue of Sustainability (MDPI) on EROI; in Sustainability (MDPI) see: Slides & notes; pre-publication archive arXiv:1104.3570v1
- 2010-4** [The Energy Physics of Continuity in Change](#) - accumulated notes and 1995 physics theorem
- 2010-3** [Models Learning Change](#) - physics for adapting theory to changing realities of complex systems - for Cosmos & History pdf copy
- 2010-2** [Defining A Standard Measure For Whole System EROI Combining Economic “Top-Down” And LCA “Bottom-Up” ACCOUNTING EROI for Wind farms - whole system 'Bottom-up' and 'Top-down' Accounting methods - for ASME-ES – Best Paper of the Year Award \(published as 2011-1\)](#)
- 2010-1** [Complex Systems](#) - History & open Issues the complex systems sciences - for the Encyclopedia of the Earth, pdf copy
- 2009-3** [Why Efficiency Multiplies Consumption](#) - presented for BioPhysical Economics Oct 2009
- 2009-2** [TEA - Total Environmental Assessment](#) - prepared for ACLCA Oct 2009 PowerPoint
- 2009-1** [Models Learning Change](#) - adapting models to the natural world of complex systems, Cosmos & History V6 #1, 2010
- 2008-2** [Life's Hidden Resources for Learning](#), Cosmos & History Nov 2008 issue on "What is Life"
- 2007-1** [Flowing processes in a punctuated speciation, displaying feedback driven evolution in G. pleisotumida to G. tumida](#), Abstract & Intro – pending submission 12
- 2000-1** (Paper 1999-1 republished) in Marcos Rodrigues ed., Invariants for Pattern Recognition and Classification, World Scientific, 2000, Chapter 6
- 1999-1** [Features of derivative continuity in shape](#), International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI link to article), for a special issue on invariants in pattern recognition, V13 No 8 1999 1181-1199
- 1995-1**, [Reconstructing the Physical Continuity of Events](#), deriving the continuity of change from conservation laws
- 1985-2** [Unconditional Positive feedback in the economic system](#), Proceedings, Society for General Systems Research, Louisville KY

1985-1 [Directed Opportunity, Directed Impetus: New tools for investigating autonomous causation](#), Proceedings, Society for General Systems Research, Louisville KY

1983-1 [General Allocation Theory](#), a whole system model of money as information on requests for services.

1979-1 *An Unhidden Pattern of Events* [a book of essays]

- [Front Covers & Table of Contents](#), [Foreword](#), [An Unhidden Pattern of Events](#), *Two Magical Farmers, Taking hold of Things to Come, An Appropriate Approach for Appropriate Technology, What Makes a Net Working, On Finding the Knack, The Infinite Society - growth induced collapse,*
- *Natural Building Climate: W.I.S.P., Multi-Climate Building, Stage Sets for Personal Climate, Sneaky Invisible Things, Natural Orders of Convection, Building Climate Pathways, House Stories I, Back Cover-Wild Garden of the Mind*<http://www.synapse9.com/HouseStories.pdf>

1978-2 *Natural Orders in Convection*, Int'l Soc. for Solar Energy Research

1978-1 [Air Current Networks](#), Rain Magazine, Portland; Int'l Soc. for Solar Energy Research

1977-1 [House Stories I](#) - *The daily evolutions of micro-climates inside homes*