

## PANSYSTEMS METHODOLOGY IN CHINA

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Pansystems methodology (PM) is a new transdisciplinary mathematizing investigation of generalized system-transformation-symmetry in things mechanism. Its key points are to research pansymmetry or relative conservations of structures in generalized systems transformations. Specially, PM mainly studies the mathematical intertransformations of the so-called pansystems relations: macromicroscopic, motion-rest, whole-parts, body-shadow, causality, observocontrol, synergy-conflict, generalized ordering, series-parallel, simulation, clustering-discoupling, difference-identity, etc. PM is also of an exploration of methodology mathematizing and possesses reinterdisciplinary and retransdisciplinary nature in new wide active flexible profiles formed like big network for many interdisciplines, transdisciplines and metadisciplines. PM was first presented in 1976 in China and many ideas, concepts and principles of it originate from the rational kernel of Chinese ancient philosophic theories and methodology, and also from the investigation of approximation-transforming theory founded in the 1950s in China. Its birth is under the influence of the intergration and dialectical synthesis of modern science too. And the development in coordination and interpermeation of various disciplines supply it with rich nourishment and source. And from 1976 onwards, PM obtained professional development and formed some special research directions. Chinese scientists established four research groups for PM: mathematics-physics-system science, rheology, medicine, geography-ecology. Chinese scientists obtained many hundreds of new theorems in PM investigation and have got a lot of concrete developments concerning problems in about thirty traditional disciplines or topics, such as foundation of cybernetics, simulation theory, systems theory, dynamical programming and games, complex systems, artificial intelligence, economics, ecology, medicine, cognitive theory, communication principle, clustering analysis, panweighted network analysis, catastrophe analysis, discrete mathematics, topology, universal algebra, hypercomplex functions, fuzzy sets, scientific methodology, philosophy of sciences, etc. In the PM exploration, Chinese scientists obtained some extensions, complements and developments of certain famous results of Arrow, Leontief, Walras, Bellman, Kalman, Zadeh, Kakutani, Fulkerson, Dilworth, Haeckel, Lindeman, Hopkins, Neumann, Lax, Banach, Melgelyan, Walsh, Carstouiu, etc. Concepts PM concerned with are almost omnipresent and embody a transdisciplinary and quasi-unified viewpoint of new type which is quite different from that of general systems theory, traditional systems methods and fuzzy sets theory, etc., although PM obtained a lot of new concepts, principles and mathematical propositions for these well-known theories and

methods and displays close relations with them. From the PM viewpoint, fuzzy sets theory substantially is to use body-shadow relations to simulate whole-parts relations in order to treat fuzziness of things. And cybernetics and metadiagnostics mainly deal with pansystems relations of observocontrol (exterior-interior), simulation and causality. Metaecology studies the pansystems simulations of things and their generalized environments. And systems theory or systems methods emphasize pansystems relations of motion-rest, whole-parts, synergy-conflict, generalized ordering (superior-inferior, primary-secondary). And catastrophe theory, dissipative structure theory and synergetics all these three theories are interested in some special motion-rest relations related with sudden change, synergy and structure-forming. Furthermore, we can see that whole-parts and body-shadow relations are the budding bricks any mathematical structure, and now people discovered almost all important laws in mathematics-physics science appear in certain pansymmetry forms or pansystems-relations-transforming forms. PM derives academic nourishment more from mathematics-physics science, Chinese ancient methodologies, stratagems and philosophic theories, and from some everyday ungeneralized methods. PM is a developing investigation and some clear characteristics have been formed, but there is only a primary exploration with fascinating results, and Chinese scientists hope to get international academic cooperation.

#### REFERENCE

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