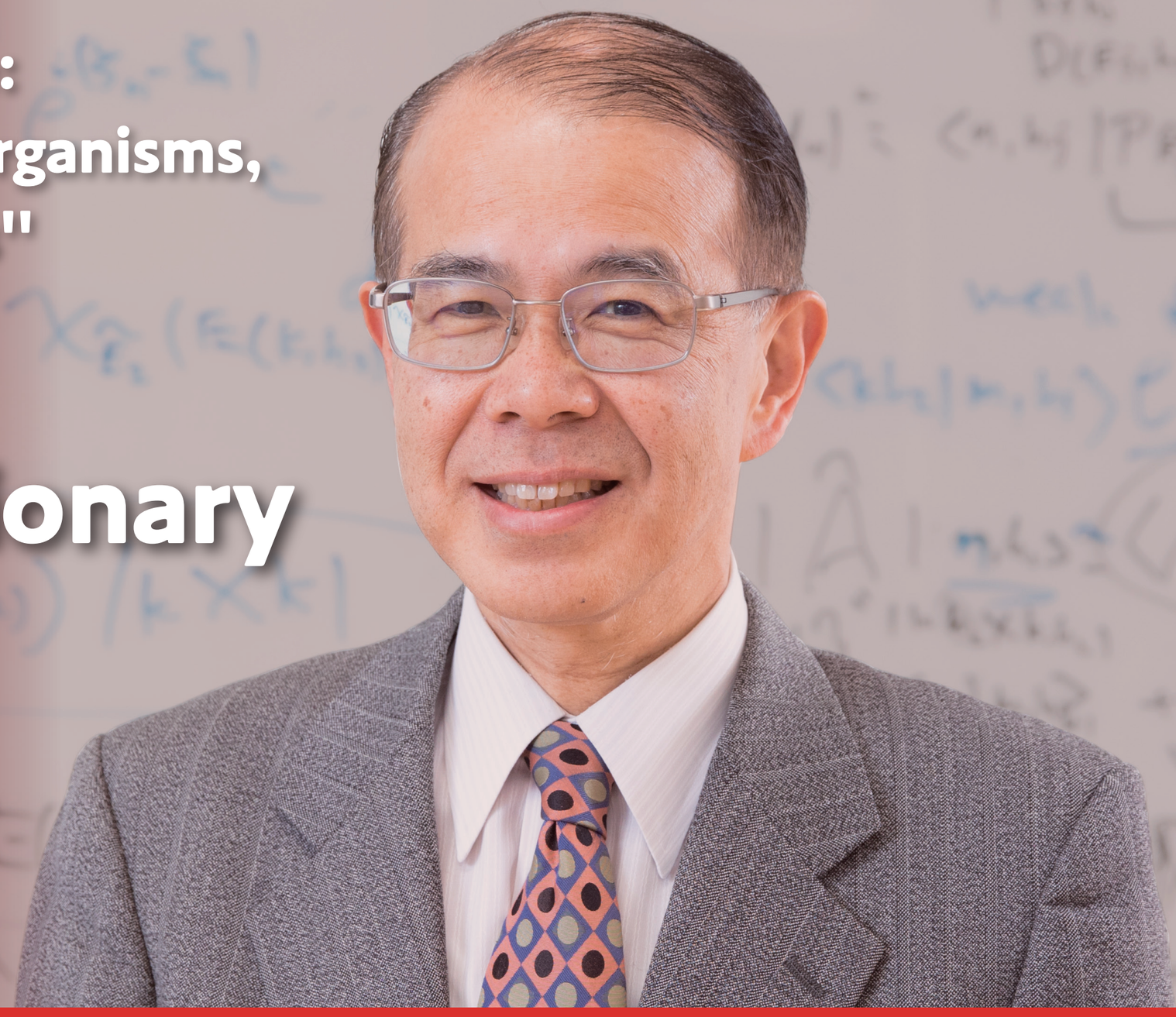
iTHEMS Colloquium

iTHEMS Intensive Course: "Adaptive strategies of organisms, their mathematical bases"

Cancer as a mini-evolutionary process



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2020 **6/25** 15:00 - 16:30

Zoom Streaming Only
https://ithems.riken.jp/ja/streaming

Living systems exhibit features distinct from nonliving physical systems: their structure and behaviors appear to be chosen adaptive. They are the outcomes of evolution. Mathematical formalisms developed in engineering and social sciences (e.g. control theory, game theory, evolutionary game theory) are sometimes very useful in biology.

This course is composed of five sessions (including the colloquium) illustrating the use of different mathematics in modeling particular aspects in biology. [1] Sex expression and sex allocation of marine organisms; [2] Dynamic optimization models for growth and reproduction; [3] Synchronized reproduction of trees (coupled chaotic system); [4] Cancer as a mini-evolutionary process. (colloquium); [5] Evolution of cooperation and illegal logging in tropical forests.

Time Schedule

[1] June 18 (Thu) 13:30-15:00

"Sex expression and sex allocation of marine organisms"
keeping gonad of unused sex, dwarf males, environmental sex determination, temperature dependent sex determination in reptiles

[2] June 19 (Fri) 13:30-15:00

"Dynamic optimization models for growth and reproduction"
timing of flowering for annual plants, shoot/root balance, annuals versus perennials, monocarpy (one time reproduction), storage as an insurance, plant defense with alkaloid and age dependence

[3] June 25 (Thu) 13:30-14:30

"Masting, synchronized reproduction of trees: Coupled chaotic system"
masting of trees, coupled chaotic systems, empirical tests, evolution of masting/nonmasting

[4] June 25 (Thu) 15:00-16:30 (Colloquium)

"Cancer as a mini-evolutionary process"
chromosomal instability, acquisition of drug resistance, enhanced cancer risk for companion animals

[5] June 26 (Fri) 13:30-15:00

"Evolution of cooperation"
social evolution by indirect reciprocity, illegal logging in tropical forests and corruption