

Speaker:

Hawoong Jeong

<Department of Physics Korea Advanced Institute of Science and Technology >

Title:

"Complex Networks in Biology: Are cells like the Internet?"

Date:	Monday, January 17
Time:	15:00 P.M. ~ 16:00 P.M.
Place:	1F Auditorium of Building C, CDB

Summary:

Systems as diverse as the Internet or the cell are described by networks with complex topology. Traditionally it has been assumed that these networks are random. However, recent studies indicate that such complex systems emerge as a result of self-organizing processes governed by simple but generic laws, resulting in topologies strikingly different from those predicted by random networks. Such studies also lead to a paradigm shift regarding our approach to complex networks, allowing us to view them as dynamical systems rather than static graphs. I will discuss the implications of these findings on the error and attack tolerance of the Internet and the robustness of the cells.

-Reference-

Kim DH, Noh JD, Jeong H.
Scale-free trees: the skeletons of complex networks.
Phys Rev E Stat Nonlin Soft Matter Phys. 2004 Oct;70(4 Pt 2):046126.

2. Goh KI, Oh E, Jeong H, Kahng B, Kim D. Related Articles, Links Classification of scale-free networks. **Proc Natl Acad Sci U S A.** 2002 Oct 1;99(20):12583-8.

3: Yook SH, Jeong H, Barabasi AL. Modeling the Internet's large-scale topology **Proc Natl Acad Sci U S A.** 2002 Oct 15;99(21):13382-6.

4: Barabasi AL, Freeh VW, Jeong H, Brockman JB. Parasitic computing. **Nature**. 2001 Aug 30;412(6850):894-7.

5: Jeong H, Mason SP, Barabasi AL, Oltvai ZN. Lethality and centrality in protein networks. **Nature**. 2001 May 3;411(6833):41-2.

6: Jeong H, Tombor B, Albert R, Oltvai ZN, Barabasi AL. The large-scale organization of metabolic networks. **Nature**. 2000 Oct 5;407(6804):651-4.

7: Albert R, Jeong H, Barabasi AL. Error and attack tolerance of complex networks **Nature**. 2000 Jul 27;406(6794):378-82. Host

Hiroki Ueda <Systems Biology, CDB> E-mail <u>hiro@cdb.riken.jp</u> Tel: 078-306-3191 (ext:4211) RIKEN Center for developmental Biology http://www.cdb.riken.go.jp/