Biological function arises from complex interactions among components. These interactions can often be represented within the framework of networks. One major trend in biological network research is studying topological organizations of large networks, which led to the discovery of prevalence of scale-free networks across all scales of biological organization, from gene networks to ecosystem networks. Mechanisms and evolution of how such a common feature in the network topology arises are not well understood.

This seminar focuses on cutting edges and challenges in this new area of biology research based on journal paper by Wolkenhauer et al. (2004). Figures from Shvartsman et al. (2004) IEEE Control Systems Magazine; Jeong et al. (2000); and from Friedman et al. (2000) Journal of Comp. Biol.

21 Participants:
- Fumi Katagiri, Plant Biology
- Neil Olszewski, Plant Biology
- Claudia Neuhauser, EEB
- A recent Science article by Laughlin and Sejnowski, part of a special networks section late last year: http://www.cedarcreek.umn.edu/lehman/neural/readings/LaughlinScience301.pdf
- Special Lecture: Shai Shen-Orr
- Special Lecture: Shai Shen-Orr
- Special Lecture: Shai Shen-Orr
- Special Lecture: Shai Shen-Orr

Website for Computational Resources

Laboratory: EEB, Plant Biology, Neuroscience, Physics, Mathematics, Conservation Biology, Lab Medicine

Supporting institutions: The European Physical Journal B

Useful tools:
- Center for Computational Genomics and Bioinformatics (http://www.ccgb.umn.edu/)
- Supercomputing facility (http://www.msi.umn.edu/)
- Climate Change Program (http://www.cedarcreek.umn.edu/)
- Center for Evolutionary Science (http://www.evolving.umn.edu/)
- Center for Plant Science (http://www.plantbio.umn.edu/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)
- Center for Science in the Public Interest (http://www.csip.org/)