We are caught in an inescapable network of mutuality. ... Whatever affects one directly, affects all indirectly. —Martin Luther King Jr.

FROM CHAOS COMES COMPLEXITY. FROM THE MOVEMENT OF MOLECULES WITHIN our cells to communication across an entire planet, we are part of networks. This special section shows how scientists are pushing network analysis to its limits across disciplinary fields.

Barabási published his seminal paper on scale-free networks a decade ago, and he starts us off by looking both at the past and the future (p. 412). The dramatic progress of researchers from disparate fields plunging into network analysis needs to be tempered by awareness of the potential dangers of misapplying fundamental assumptions (Butts, p. 414). Network analyses are also providing insights that will help us deal with our largest societal challenges. Bascompte (p. 416) confronts the effects of climate change on ecosystems and Ostrom (p. 419) examines organizing to maintain sustainability.

Physicists have taken up the challenge, too, as Adrian Cho reports (p. 406), aiming to use quantitative methods to forecast ethnic strife in Somalia, monitor surges of emotion in Internet users, and track the emergence of behavioral norms. Additionally, John Bohannon (p. 409) looks into one of the most controversial uses of network analysis: to identify key figures in terrorist organizations and eliminate them. Furthermore, networks can teach us about underlying mechanisms that affect us individually and as a society, such as monetary exchanges (Schweitzer et al., p. 422) or transportation systems that promote viral transmission (Vespignani, p. 425).

At a microscopic level, molecular biologists are using networks to analyze basic cellular circuitry (Kim et al., p. 429) to describe how interactions within a cell can be measured or modeled to generate predictions of responses to perturbation. Additionally, Science Signaling focuses on dynamics in signaling networks.

We need more and better data in many disciplines. It is not enough to look at patterns; we need to study how they evolve and change. The magnitude of the challenges we are facing shows how much we still need to learn. How can we move between levels of a complex system—to understand the transition from DNA sequence to disease symptoms or to predict the next economic recession? Network analysis is allowing us to understand how the world works from new vantage points, and it is exciting to think about what will we learn in the next 10 years.

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