SPECIAL SECTION
Complex Systems and Networks

INTRODUCTION
405 Connections

NEWS
406 Ourselves and Our Interactions: The Ultimate Physics Problem? Econophysics: Still Controversial After All These Years
>> Science Podcast
409 Counterterrorism’s New Tool: ‘Metanetwork’ Analysis Investigating Networks: The Dark Side

PERSPECTIVES
412 Scale-Free Networks: A Decade and Beyond
A.-L. Barabási
414 Revisiting the Foundations of Network Analysis
C. T. Butts

REVIEW
429 Transcriptional Regulatory Circuits: Predicting Numbers from Alphabets
H. D. Kim et al.
>> See also related Policy Forum on p. 396, and https://www.sciencemag.org/complexity/ for additional material from Science Signaling and Science Careers

EDITORIAL
368 Research Data in the Digital Age
Daniel Kleppner and Phillip A. Sharp
>> News story p. 381

NEWS OF THE WEEK
374 Forensic Finds Add Substance to Claims of War Atrocities
375 DOE Puts Up $85 Million for Grants to Young Scientists
376 Clouds Appear to Be Big, Bad Player in Global Warming
>> Report p. 460
377 Spy Satellites Give Scientists a Sharper Image of Field Sites

377 From Science’s Online Daily News Site
378 NOAA Project to Measure Gravity Aims to Improve Coastal Monitoring
379 ExxonMobil Fuels Venter’s Efforts to Run Vehicles on Algae-Based Oil
380 With ‘Phenomics,’ Plant Scientists Hope to Shift Breeding Into Overdrive
381 Data Integrity Report Sends Journals Back to the Drawing Board
>> Editorial p. 368

NEWS FOCUS
382 Test Ban Monitoring: No Place to Hide Comprehensive Test Ban: The Long Road
>> Science Podcast

386 Deadly Flights
388 Phytoplasma Research Begins to Bloom
391 A Good Sign

LETTERS
392 Promoting Engineering
E. C. Eckstein
Do Not Underestimate Science
C. Koch
Immune System: Success Owed to a Virus?
D. H. Dreyfus
Immune System: “Big Bang” in Question
T. Pradeu
Immune System: Prometheus Evolution
A. M. Silverstein

393 CORRECTIONS AND CLARIFICATIONS

CONTENTS continued >>

COVER
A computer-generated map showing relationships between Internet blogs (colored spots), where lines represent links between individual blogs. In this map, blogs within the inner core cover technical topics and gadgetry, and blogs in the outer sphere involve nontechnical discussions and link back to the technical ones. See the special section on complex systems and networks beginning on page 405.

Image: Matthew Hurst
449 Structural Origin of Circularly Polarized Iridescence in Jeweled Beetles
V. Sharma et al.
The cellular ordering in the exoskeleton of a beetle is analogous to the molecular ordering in cholesteric liquid crystals.
>> Perspective p. 398

452 Chiral Isotropic Liquids from Achiral Molecules
L. E. Hough et al.
Banana-shaped molecules lacking handedness form a macroscopically isotropic fluid that still has overall chirality.
>> Perspective p. 402

460 Observational and Model Evidence for Positive Low-Level Cloud Feedback
A. C. Clement et al.
Decreased low-level cloud cover in the Northeast Pacific region amplifies increases in sea surface temperatures.
>> News story p. 376; Science Podcast

464 The Dynamics of Phenotypic Change and the Shrinking Sheep of St. Kilda
A. Ozgul et al.
Environmental change has led to decreasing body size in a sheep population over 20 years, despite selection for increased size.

471 Heat Exchange from the Toucan Bill Reveals a Controllable Vascular Thermal Radiator
G. J. Tattersall et al.
Toucans alter blood flow to their massive bills according to ambient conditions.

477 A Gene Network Regulating Lysosomal Biogenesis and Function
M. Sardiello et al.
Synchronous activation of genes with stalled RNA polymerase improves transcriptional coordination.

490 Translocator Protein (18 kD) as Target for Anxiolytics Without Benzodiazepine-Like Side Effects
R. Rupprecht et al.
Possible drug alternative for rapid treatment of anxiety disorders could replace benzodiazepines.

CONTENTS continued >>
Motile Cilia of Human Airway Epithelia Are Chemosensory
A. S. Shah et al.
Airway epithelia directly sense and respond to noxious substances.
10.1126/science.1175689

SDH5, a Gene Required for Flavination of Succinate Dehydrogenase, Is Mutated in Paraganglioma
H.-X. Hao et al.
Analysis of a yeast mitochondrial protein reveals a human tumor susceptibility gene.
10.1126/science.1175689

Bcl6 Mediates the Development of T Follicular Helper Cells
R. I. Nurieva et al.
A transcription factor controls follicular T helper cell differentiation.
10.1126/science.1176076

Researchers studying math education.

How a Raindrop Is Like an Exploding Parachute
High-speed videos reveal secret to raindrop size.
10.1126/science.1176676

No Risk in Disclosing Genetic Risks
Investigation of signaling pathways that are perturbed in neurodegenerative diseases may improve treatment options.
RESEARCH ARTICLE: Inhibition of mTOR Signaling in Parkinson’s Disease Prevents L-DOPA–Induced Dyskinesia
E. Santini et al.
PERSPECTIVE: Thwarting Dyskinesia by Targeting mTORC1
E. Klann
Blocking mTORC1 activity may decrease the unwanted involuntary movements associated with L-DOPA treatment.
10.1126/science.1174290

Individual electrons tunneling onto and out of a nanotube can be used to tune its oscillatory motion.
10.1126/science.1174290

Carbon Nanotube Mechanical Resonators: Coupling Mechanics to Charge Transport
B. Lassagne et al.
Coupling Mechanics to Charge Transport in Carbon Nanotube Mechanical Resonators
B. Lassagne et al.
10.1126/science.1174290

Strong Coupling Between Single-Electron Tunneling and Nanomechanical Motion
G. A. Steele et al.
Individual electrons tunneling onto and out of a carbon nanotube can be used to tune its oscillatory motion.
10.1126/science.1176076

Neurons from Parkinsonian mice.

No Risk in Disclosing Genetic Risks
W. Wong
Investigation of signaling pathways that are perturbed in neurodegenerative diseases may improve treatment options.

COMPLEX SYSTEMS AND NETWORKS
How clouds impact climate, research on complex socioeconomic systems, policing nuclear testing, and more.

Scientists then identified another gene that promotes the development of T follicular helper cells:

T Helper Cell Differentiation
A transcription factor controls follicular T helper cell differentiation.
10.1126/science.1175689

A small G protein may limit the toxicity of mutant huntingtin to the brain.

Blocking mTORC1 activity may decrease the unwanted involuntary movements associated with L-DOPA treatment.

How clouds impact climate, research on complex socioeconomic systems, policing nuclear testing, and more.

Math Education Researchers in Demand
C. Wald
In 2007, 40 percent of faculty positions in mathematics education went unfilled.

Tangled Webs: Careers in Network Science
S. Carpenter
The booming science of networks reveals hidden connections in just about everything.

>> Complex Systems and Networks section p. 405

Funding News
GrantsNet Staff
The Funding News, published weekly, provides the latest sources of research and education grants.