Artist’s rendering of the film-nanoparticle plasmonic system. Spherical gold nanoparticles are coupled to a gold film substrate by means of an ultrathin layer that prevents the particles from directly touching the film. Electromagnetic ultrahot spots are excited in the gaps. The system enables the exploration of light interactions occurring on a scale of a few tenths of a nanometer, the diameter of a typical atom. See page 1072.

Image: Sebastian Nicosia and Cristian Ciraci
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1066 Interception of Excited Vibrational Quantum States by O₂ in Atmospheric Association Reactions
D. R. Glowacki et al.
Vibrationally excited reaction intermediates play a bigger role under atmospheric conditions than previously suspected.
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1069 Conduction of Ultracold Fermions Through a Mesoscopic Channel
J.-P. Brantut et al.
Lithium atoms are used to simulate electronic transport.

1072 Probing the Ultimate Limits of Plasmonic Enhancement
C. Ciraci et al.
The nonlocal dielectric response of metals places a fundamental limit on the performance of plasmonic optical devices.

1075 Biogenic Potassium Salt Particles as Seeds for Secondary Organic Aerosol in the Amazon
C. Pöhlker et al.
Potassium salt particles account for the previously mysterious initiation sites of aerosol growth above the Amazonian rainforest.
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1078 Radiative Absorption Enhancements Due to the Mixing State of Atmospheric Black Carbon
C. D. Cappa et al.
Direct measurements show that ambient atmospheric particulate black carbon absorbs less solar radiation than theory suggested.

1081 A Gain-of-Function Polymorphism Controlling Complex Traits and Fitness in Nature
K. V. S. K. Prasad et al.
Positive selection for a mutation that enhances resistance to herbivory in the model plant Boechera is described.

1084 Arbuscular Mycorrhizal Fungi Increase Organic Carbon Decomposition Under Elevated CO₂
L. Cheng et al.
Counter to expectations, fungi associated with plant roots diminish the carbon pool in soil ecosystems under elevated levels of carbon dioxide.
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1087 How the Cucumber Tendril Coils and Overwinds
S. J. Gerbode et al.
Plants climb via lifelines that are a mix of strength and flexibility.

1091 A Single Progenitor Population Switches Behavior to Maintain and Repair Esophageal Epithelium
D. P. Doupé et al.
Dividing cells in the mouse esophagus contribute to wound healing without the need for quiescent stem cells.
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1094 Identification of Small Molecule Activators of Cryptochrome
T. Hirota et al.
A small molecule binds to a core protein in the circadian clock and slows down time.

1097 Extreme Bendability of DNA Less than 100 Base Pairs Long Revealed by Single-Molecule Cyclization
R. Vafabakhsh and T. Ha
DNA molecules are not quite as stiff or standoffish as originally thought.
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1101 Network Context and Selection in the Evolution to Enzyme Specificity
H. Nam et al.
Are less promiscuous enzymes more highly evolved?

1104 Synthesis of Methylphosphonic Acid by Marine Microbes: A Source for Methane in the Aerobic Ocean
W. W. Metcalf et al.
The archaeon Nitrosopumilus marinus makes what may be a major source of ocean methane.

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Perfect identity between antibiotic resistance genes in farmland soil bacteria and human pathogens suggests direct transfer.
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M. Oldenburg et al.
A region of ribosomal RNA that confers antibiotic resistance is also recognized by mouse innate immune receptors.

1115 Compartmentalized Control of Skin Immunity by Resident Commensals
S. Naik et al.
The skin microbiota play a selective role in modulating immunity in the skin of mice.