First described by David Hilbert in 1891, the Hilbert curve is a one-dimensional fractal trajectory that densely fills higher-dimensional space without crossing itself. A new method for reconstructing the three-dimensional architecture of the human genome, described on page 289, reveals a polymer analog of Hilbert’s curve at the megabase scale.

Image: Leonid A. Mirny and Erez Lieberman-Aiden
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247  Reconstituting Bacterial RNA Repair and Modification in Vitro
     C. M. Chan et al.
     A protein heterotetramer repairs RNA cleaved by ribotoxins, and methylation protects against further ribotoxin attack.

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     H. Cheng et al.
     Variability of the Asian Monsoon over the past 400,000 years correlates with the ends of glacial periods.
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252  Reactome Array: Forging a Link Between Metabolome and Genome
     A. Beloqui et al.
     A microarray technique uses trapped, dye-associated metabolites to allow rapid global characterization of metabolic activity.

257  Unbiased Reconstruction of a Mammalian Transcriptional Network Mediating Pathogen Responses
     I. Amit et al.
     Inflammatory and antiviral programs in dendritic cells are controlled and tuned by a network of regulators.

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     D. G. Kuroda et al.
     A simple manipulation of the phase of a laser pulse optimizes photoemission efficiency in a complex molecule.
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267  Repetitive Readout of a Single Electronic Spin via Quantum Logic with Nuclear Spin Ancillae
     L. Jiang et al.
     Controlled interactions with nearby nuclear spins help improve the quantum memory of a nitrogen vacancy in diamond.

272  Persistent Currents in Normal Metal Rings
     A. C. Bleszynski-Jayich et al.
     A nanomechanical resonator is used to detect weak persistent currents that flow in resistive metal rings.
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275  The Shape and Surface Variation of 2 Pallas from the Hubble Space Telescope
     B. E. Schmidt et al.
     Like the asteroids Ceres and Vesta, Pallas is a protoplanet that has remained intact since its formation.

278  Evolutionary Development of the Middle Ear in Mesozoic Therian Mammals
     Q. Ji et al.
     Fossil evidence and studies of mutant mice show that gene patterning allowed multiple evolutions of the mammalian middle ear.
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281  Daily Electrical Silencing in the Mammalian Circadian Clock
     M. D. C. Belle et al.
     Clock-containing neurons in the mouse brain display complex electrophysiology not seen in other brain cells.

285  Broad and Potent Neutralizing Antibodies from an African Donor Reveal a New HIV-1 Vaccine Target
     L. M. Walker et al.
     High-throughput screening has revealed two new broadly neutralizing antibodies from a clade A–infected donor in Africa.

289  Comprehensive Mapping of Long-Range Interactions Reveals Folding Principles of the Human Genome
     E. Lieberman-Aiden et al.
     Chromosomes are organized in a fractal knot-free conformation that is densely packed while easily folded and unfolded.
     >> Science Podcast

294  Arterial-Venous Segregation by Selective Cell Sprouting: An Alternative Mode of Blood Vessel Formation
     S. P. Herbert et al.
     An alternative developmental pathway for vertebrate vasculature segregates a precursor vessel into two separate vessels.
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298  KLF Family Members Regulate Intrinsic Axon Regeneration Ability
     D. L. Moore et al.
     The regenerative capacity of mouse retinal ganglion cells after injury is regulated by the KLF family of transcription factors.
Editor's Summary