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Corals such as this 150-million-year-old colony of Thecosmilia trichotoma (with oyster Actinostreon attached) from southern Germany formed reefs during most of the Phanerozoic eon. These reefs harbored tremendous biodiversity that was subsequently exported to non-reef habitats. See page 196.

Photo: Antje Dittmann and Carola Radke/Museum für Naturkunde, Berlin

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Analysis of fossil evidence indicates that reefs were disproportionally important in the origin of new species.

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A long-predicted hidden symmetry in spin ordering has been observed experimentally at temperatures near absolute zero.

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S. W. Boettcher et al.
The use of copper catalysts helps to increase charge-carrier mobilities in silicon microwire growth.

190 E-Type Asteroid (2867) Steins as Imaged by OSIRIS on Board Rosetta
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Incident sunlight probably caused this asteroid to spin, which redistributed its mass and smoothed its surface.

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A. H. Rosengren et al.
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The signaling breakthroughs of 2009 emphasize the importance of looking beyond linear signaling pathways.

RESEARCH ARTICLE: Impaired αvβ3 Integrin Activation and Shear-Dependent Thrombus Formation in Mice Lacking Phospholipase D1
M. Elvers et al.
In the absence of PLD1, platelets do not form stable aggregates under high shear conditions.

PERSPECTIVE: New Endogenous Regulators of Class I Histone Deacetylases
A. Riccio
Extracellular stimuli can elicit alterations in gene transcription through regulation of histone deacetylases by sphingosine-1-phosphate.

PODCAST
M. B. Yaffe and A. M. VanHook
Chief Scientific Editor Michael Yaffe reviews the year in Science Signaling.
Science 327 (5962), 123-221.

http://science.sciencemag.org/content/327/5962

http://www.sciencemag.org/help/reprints-and-permissions