with carrier localization. This would pave the way for precise engineering of the valence-band offsets[10], and hence carrier confinement in materials such as InP and GaAs, which are commonly found in today's optoelectronic devices.

Important open questions remain for both theory and experiment. The observations of Chekhovich *et al.* are based on measuring energy shifts. There is no information on the hole-spin evolution in time, although their theory makes clear predictions: pure heavy-hole states will suffer from decoherence because of the admixture of *d*-orbitals. This is an important extension of current theories that have indentified substantial heavy-hole to light-hole mixing as the main reason that strong hole–nuclear spin interaction leads to hole-spin decoherence[4]. With this new understanding, future experiments — possibly combined with first principles calculations — will help to develop quantum-dot devices with stable hole-spin states. ❐

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SOLAR PHYSICS

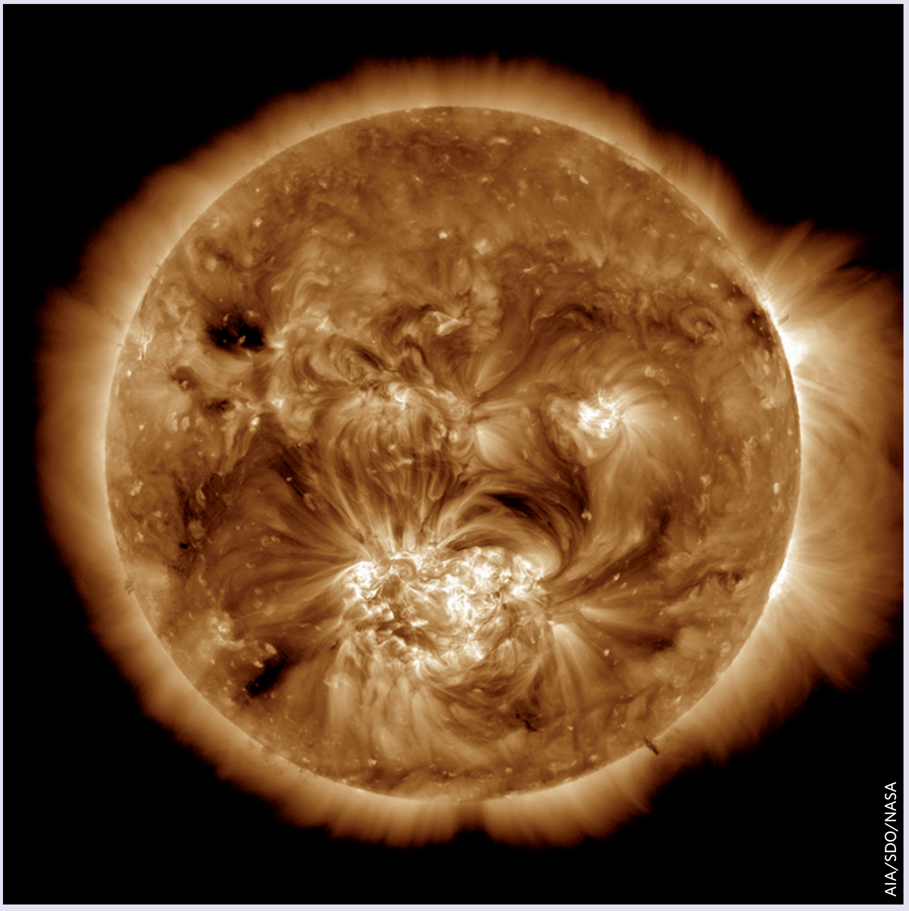
Magnetic dance

The temperature of the Sun's outer atmosphere — the corona — can reach a few million degrees, making it even hotter than the Sun's surface, or photosphere. Two different mechanisms could be behind the coronal heating: the plasma and magnetic-field oscillations know as Alfvén waves; and magnetic 'braids', which are reconnected magnetic-field loops.

Alfvén wave-heating, the main heating mechanism in quiet periods of solar activity, contributes to a rise in coronal temperature of about 1.5 million kelvin. The extra energy required to reach temperatures of up to 4 million kelvin in the active regions may arise from the dynamics of magnetic braids, but so far direct evidence of braiding in the corona has been lacking.

As they report in *Nature*, Jonathan Cirtain and colleagues used new data from NASA's High Resolution Coronal Imager (Hi-C, a rocket-borne telescope launched in July 2012) to resolve magnetic braids whose dissipated energy could account for the high coronal temperatures (*Nature* **493,** 501–503; 2013).

Observations from JAXA's Hinode spacecraft and from the Atmospheric Imaging Assembly (AIA) onboard NASA's Solar Dynamics Observatory have provided information about coronal temperatures, but the data lacks the resolution to distinguish the twisting and braiding of magnetic-field loops. Hi-C, however, has captured the most detailed images of the corona ever taken — 150-kilometre resolution at extreme ultraviolet wavelengths, producing pictures five times more detailed than those from the AIA.



Cirtain *et al.* are able to clearly identify the twisting, reconnecting dance of magnetic-field loops. The lively dynamics — driven by convective flows in the photosphere — release energy into the corona, in sufficient quantities to raise the temperature to 4 million kelvin. However, more extensive future observations will determine whether magnetic braiding is the dominant heating mechanism in the active regions.

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