Quintessence drives inconstant constant

The idea that the fine structure "constant" α might vary with time is an old one, but has been bolstered by observations of distant quasars that suggest α could have been dramatically smaller some 10 billion years ago. On the other hand, terrestrial measurements suggest only a very slow variation (if any!), which seems to be incompatible with the quasar work (*CERN Courier* March 2003 p15).

Now Luis Anchordoqui and Haim Goldberg of Northeastern University, US, have shown that these pictures can be reconciled by linking the variation in α not just to the passage of time, but also to the evolution of the dynamical scalar field known as "quintessence". This has been proposed to explain the "dark energy" that appears to control the expansion of the universe (*CERN Courier* September 2003 p23). In particular, Anchordoqui and Goldberg have considered the model of Andreas Albrecht and Constantinos Skordis, in which the quintessence field has rapidly slowed in the recent past. They found that they obtained agreement with all the data on α. So it does indeed seem that while most of the things in the universe fly away from each other, protons and electrons – as if to defy the expansion of space – hold ever tighter to each other as α increases.

Further reading

L Anchordoqui and H Goldberg 2003 *Phys. Rev. D* **68** 083513.