

**A note by Clive Kilmister on his recent
Fine-Structure Constant Evaluation**

Ted Bastin and Clive Kilmister have recently found a very accurate value of α^{-1} by following an abstract investigation of how physics is possible. They began this investigation in the 1960s to try to understand a conjecture of Frederick Parker-Rhodes. He had elaborated an unusual hierarchical matrix structure (over the number field with two elements) in which the four possible hierarchy stages had 3, 10, 137 and 10^{38} elements. His conjecture was that at least the last two corresponded to the inverse coupling constants of electromagnetism and gravitation. The final outcome of Bastin and Kilmister's investigation is loosely related to Parker-Rhodes. It is based on the notion of process and leads to a mathematical structure, again hierarchical but with a non-associative multiplication. This structure represents a pre-condition for imagining the physical world. Although this structure is separate from the formulae in which ordinary physics is expressed, it has consequences for their form. One such consequence is a determinate value for a certain constant which arises. This value, 137.036011393..., agrees to better than one part in 10^7 with the observed value of the inverse fine-structure constant. The rather complicated arithmetical calculations were checked by Ron Weeden. There are no disposable constants that could be used to improve the result. The identification of the constant with α^{-1} is consistent with Bastin and Kilmister's view that there is a subset of all physical constants, which they call *scale constants* that are fixed prior to observation. Further details are in the Proceedings of the annual conferences of the *Alternative Natural Philosophy Association* for 2004 – 6 and in a book *The Origin of Discrete particles*, due in 2009.