Small Effects, Large Consequences

From Relativity to Electroweak Interactions

Prof Peter Schwerdtfeger
Centre of Theoretical Chemistry and Physics, Institute of Fundamental Sciences, Massey University (Albany Campus)

-12.15pm-
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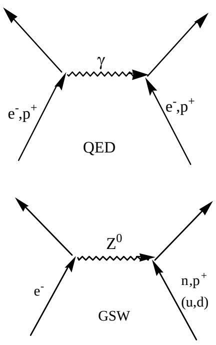
-Abstract-
Relativistic effects scale approximately with Z^2 (Z = nuclear charge), hence one expects relativistic effects to become important for the heavier elements in the periodic table, especially for the elements beyond nuclear charge 103, the so-called superheavy elements. Only in the last two decades has it become clear that relativistic effects are not small and are responsible for a number of anomalies now observed in molecules or in the solid state. To include such effects, one has to go beyond the *Schrödinger* equation to its relativistic extension, the *Dirac* equation. The question one may now ask: are other effects regarded as too small (like quantum electrodynamic or weak interactions) important for chemistry as well?



$$H\Psi(\vec{r}_i\sigma_i,t) = i\hbar\frac{\partial}{\partial t}\Psi(\vec{r}_i\sigma_i,t)$$

$$\begin{pmatrix} V-E+f & c\vec{\sigma}\vec{p} \\ c\vec{\sigma}\vec{p} & -2mc^2+V-E+f \end{pmatrix}\begin{pmatrix}\varphi_L \\ \varphi_S\end{pmatrix}=0$$

Venues

- Rankine Brown 106, Victoria University of Wellington-
-Video Conference Room, C-Block, IRL, Gracefield Site, Lower Hutt-
-Level-3 lecture theatre (A309), ELEC Dept Building, Canterbury University-
- ScB2.09 (College of Sciences Board Room), Science Tower B. Massey University-

The MacDiarmid Institute
for Advanced Materials and Nanotechnology

-Conference Room 2, Otago University-