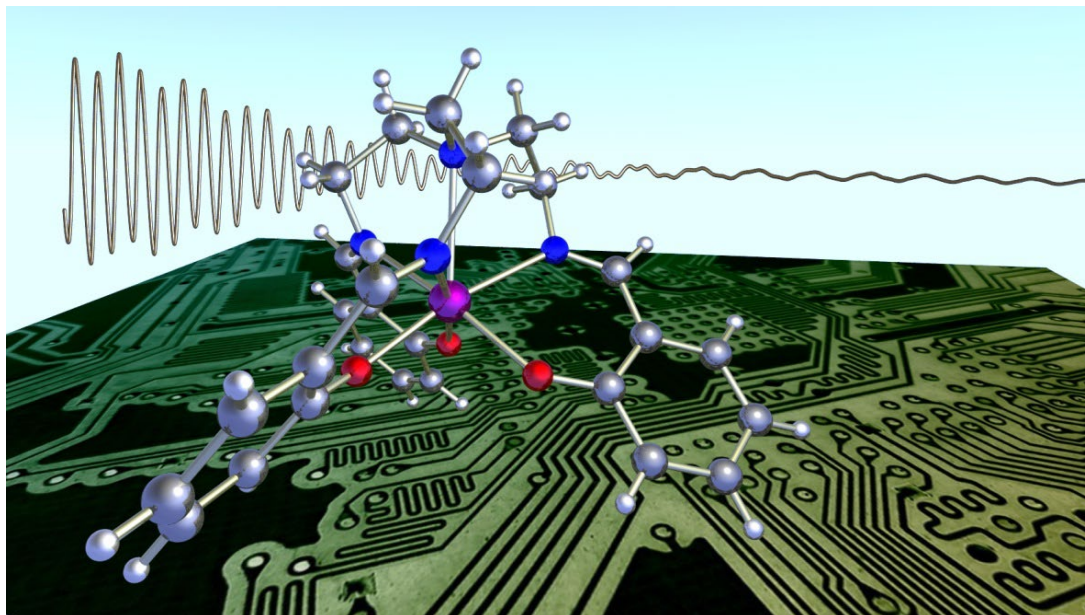


## Molecular Lanthanide Complexes for Quantum Technologies

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**Figure 1** Illustration depicting the quantum coherence properties of Yb(trensal) and its suitability for surface deposition in view of its potential use in Quantum Technologies.

We have shown, in collaboration with many co-workers, that molecular Lanthanide-based coordination complexes hold potential for use as physical supports for the implementation of quantum bits and quantum gates in Quantum Information Technology devices. We studied the coherent dynamics of electronic and nuclear spins in Yb(trensal), by pulsed magnetic resonance experiments on oriented single-crystals.<sup>1,2</sup> The coupled electronic qubit-nuclear qudit nature of this system allowed to propose a scheme for intrinsic implementation of efficient quantum error correction schemes.<sup>2</sup> In further work, we investigate the multifrequency single crystal c.w.- and pulse EPR spectra of Gd(trensal), to characterize the energy spectrum and coherent magnetisation dynamics of its  $^8S_{7/2}$  ground term.

[1] K. S. Pedersen *et al.*, *J. Am. Chem. Soc.*, **138**, 5801 (2016).

[2] R. Hussain *et al.*, *J. Am. Chem. Soc.*, **140**, 9814 (2018).