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Abstract for an Invited Paper
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Spin-orbit coupling and interaction control with optical clock transitions in ultracold Fermi gases

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I will report on recent experiments performed with ultracold quantum gases of two-electron 173Yb fermions. Thanks to the coherent control of their electronic state with ultranarrow optical clock transitions, we have demonstrated new schemes for spin-orbit coupling in pure two-level systems and the generation of tunable gauge fields in synthetic ladders. I will describe the latest experimental developments and the new perspectives offered by the control of atom-atom interactions with orbital Feshbach resonances.