

Revolutionary guitar string rocks the guitar world

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Credit: University of St Andrews

A revolutionary guitar string developed at the University of St Andrews has struck a chord with some of the greats of the music world.

The invention by Dr Jonathan Kemp, Head of Music Technology at the Music Centre who also lectures in the School of Physics and Astronomy, allows electric guitar strings to be balanced in sensitivity and feel in a way that has never been achieved before for an instrument with standard hardware.

Among those who have shown an interest are: Guthrie Govan, David Torn, Paul Masvidal (from the band Cynic), and Pete Malandrone, guitar technician to Queen guitarist Brian May.

Guitarist Mark McGuigan of mastertheguitar.co.uk with more than 8 million views on YouTube said: "The new strings are awesome fun and provide fantastic new creative opportunities for your whammy bar."

Dr Kemp's work is the subject of a paper called "The Physics of Unwound and Wound Strings on the Electric Guitar Applied to the Pitch Intervals Produced by Tremolo/Vibrato Arm Systems" published in the journal *PLOS One* (21 September 2017).

Dr Kemp said:

"While string sets have been available before with balanced tensions, those strings have featured different sensitivities, with all strings bending through different pitch intervals when the player performs identical movements.

"The laws of physics prevent equalised feel between different plain steel strings. With the new strings the properties are controlled to ensure that four of the strings (the plain G and the overwound D, A and low E strings) on a standard electric guitar bend through the same pitch

intervals for identical player control changes, whether that be through conventional pitch bends (dragging the strings through a certain distance along a fret to increase tension) or through use of a tremolo/vibrato arm.

"The clearest demonstration of this is through listening to chords played on these strings during tremolo arm use."

The new strings mean that chord bends can be achieved that have not been possible before on standard guitars, such as Fender Stratocasters with standard tremolo units or guitars with the Floyd Rose locking tremolo system.

All electric guitar players can benefit from the new strings (not just users of tremolo arms) as the optimised sensitivity means that the D string is no longer more difficult to bend than its neighbours and the low E [string](#) no longer goes more sharp than the rest of the strings when played hard.

Temperature related tuning problems are also reduced.

Dr Kemp said: "The new strings are as cheap to construct as existing designs and all in all this amounts to a breakthrough for electric [guitar](#) performance and one that doesn't require any expensive changes to players' existing instruments."

More information: Jonathan A. Kemp et al. The physics of unwound and wound strings on the electric guitar applied to the pitch intervals produced by tremolo/vibrato arm systems, *PLOS ONE* (2017). [DOI: 10.1371/journal.pone.0184803](https://doi.org/10.1371/journal.pone.0184803)

Provided by University of St Andrews

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