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## **Higgs Criticality and the Metastability Bound: a target for future colliders**

New physics at the TeV scale or lower may destabilise the electroweak vacuum. How low could the vacuum instability scale be? This fundamental question may be tied to a deeper understanding of the Higgs potential and its associated hierarchy problem. The scale of vacuum instability can be viewed as an upper bound on the Higgs mass-the so-called vacuum metastability bound-and criticality of the Higgs potential through some underlying mechanism then places our universe at this metastable point. In this report, we summarise recent work developing this eminently testable hypothesis. If the vacuum metastability bound plays a role in determining the properties of the Higgs boson, the new physics responsible will likely be discovered or excluded in the entire natural region of parameter space at future facilities. This makes it a tantalising and attractive target for future colliders.

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