

Abstract Submitted  
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**The Curious Ontology of a Light Higgs Boson** MICHAEL RIORDAN, University of California, Santa Cruz (Emeritus) — When the Superconducting Super Collider was being contemplated and designed in the mid-1980s, few high-energy physicists considered it likely that a light Higgs boson, as was eventually discovered at the Large Hadron Collider, would exist. Most theorists expected that the Higgs boson would occur at a mass near the TeV scale, and accelerator physicists designed the Super Collider accordingly. The possibility of a light Higgs boson with a mass less than 200 GeV began to be taken seriously during the 1990s, especially after the 1995 Fermilab discovery of the top quark near 175 GeV, but it was too late to influence the SSC design. With a peak collision energy of 40 TeV, this collider was guaranteed to discover the Higgs boson — or whatever other mass-generating phenomenon might be occurring in the Standard Model — even if it were to appear at masses or energies up to 2 TeV. As it turned out, therefore, the SSC was overdesigned for its principal physics goal. A substantially smaller Fermilab project known as the Dedicated Collider, which never made it beyond the drawing boards, could probably have allowed the 125 GeV Higgs boson to be discovered at least a decade earlier than it occurred at the LHC.

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