

Final but Incomplete - how 21st century fundamental physics might differ from the physics we know

Richard Dawid

Stockholm University, Sweden

Fundamental physics in the 20th century was mostly characterized by two features. Theories could be completed within reasonable time to provide extensive and often stunningly successful predictions of physical phenomena. At the same time, they were expected to get superseded by more fundamental successors once the limits of their applicability had been reached. Fundamental physics today offers a substantially different picture. Theories such as string theory have not come close to a complete formulation after half a century of intense research. On the other hand, there are indications that the traditional understanding of theory succession is not applicable to physics at the Planck scale (the high energy scale where Gravity becomes as strong as nuclear interactions). In a sense that still awaits clear specification, finality seems to play an important role when assessing the status of Planck scale theories. In this talk, I will discuss the described shift and look at its possible implications for the long term prospects of theory building in fundamental physics.