In this talk Venkatesh (Venky) Narayanamurti will reflect on the genesis of the Information and Communications revolution and through an analysis of the hard case of Nobel Prizes in Physics to show that the causal direction of scientific discovery and radical invention are often reversed. They often arose in a culture of so called “applications oriented research” in industrial laboratories and he will use those examples to enumerate the key ingredients of highly successful R&D institutions. His views have been shaped by his own personal experiences in industrial research, U.S National Laboratories and research intensive universities. By exploring the daily micro-practices of research, he will show how distinctions between the search for knowledge and creative-problem solving break down when one pays attention to how path breaking research actually happens. He will highlight the importance of designing institutions which transcend the ‘basic-applied’ dichotomy and contrasting them with models of the classic but still influential report Science, The Endless Frontier. The need for new integrative institutions to address global challenges such as climate change and alternative energy sources will be discussed.